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SUBMISSION

Rationale for, and impacts of, new dams and other water infrastructure in NSW

October 2020



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NSW Irrigators' Council

The NSW Irrigators' Council (NSWIC) is the peak body representing irrigation farmers and the irrigation farming industry in NSW. Our members include valley water user associations, food and fibre groups, irrigation corporations and commodity groups from the rice, cotton and horticultural industries.

Through our members, NSWIC represents over 12,000 water access licence holders in NSW who access regulated, unregulated and groundwater systems. NSWIC engages in advocacy and policy development on behalf of the irrigation farming sector. As an apolitical entity, the Council provides advice to all stakeholders and decision makers.

Irrigation farmers are stewards of tremendous local, operational and practical knowledge in water management. With more than 12,000 irrigation farmers in NSW, a wealth of knowledge is available. Participatory decision making and extensive consultation ensure this knowledge can be incorporated into best-practice, evidence-based policy.

NSWIC and our members are a valuable way for Governments and agencies to access this knowledge. NSWIC offers the expertise from our network of irrigation farmers and organisations to ensure water management is practical, community-minded, sustainable and follows participatory process.

NSWIC welcomes this opportunity to provide a submission on the Draft Report for the *Rationale for, and impacts of, new dams and other water infrastructure in NSW*.

NSWIC sees this as a valuable opportunity to provide expertise from our membership to inform the Inquiry. Each member reserves the right to independent policy on issues that directly relate to their areas of operation, expertise or any other issues that they deem relevant.

NSW Irrigation Farming

Irrigation farmers in Australia are recognised as world leaders in water efficiency. For example, according to the Australian Government Department of Agriculture, Water and the Environment:

“Australian cotton growers are now recognised as the most water-use efficient in the world and three times more efficient than the global average”¹

“The Australian rice industry leads the world in water use efficiency. From paddock to plate, Australian grown rice uses 50% less water than the global average.”²

Our water management legislation prioritises all other users before agriculture (critical human needs, stock and domestic, and the environment), meaning our industry only has water access when all other needs are satisfied. Our industry supports and respects this order of prioritisation. Many common crops we produce are annual/seasonal crops that can be grown in wet years, and not grown in dry periods, in tune with Australia's variable climate.

Irrigation farming in Australia is also subject to strict regulations to ensure sustainable and responsible water use. This includes all extractions being capped at a sustainable level, a hierarchy of water access priorities, and strict measurement requirements.

¹ <https://www.agriculture.gov.au/ag-farm-food/crops/cotton>

² <https://www.agriculture.gov.au/ag-farm-food/crops/rice>



NSW Irrigators' Council's Guiding Principles

Integrity	Leadership	Evidence	Collaboration
Environmental health and sustainable resource access is integral to a successful irrigation industry.	Irrigation farmers in NSW and Australia are world leaders in water-efficient production with high ethical and environmental standards.	Evidence-based policy is essential. Research must be on-going, and include review mechanisms, to ensure the best-available data can inform best-practice policy through adaptive processes.	Irrigation farmers are stewards of tremendous knowledge in water management, and extensive consultation is needed to utilise this knowledge.
Water property rights (including accessibility, reliability and their fundamental characteristics) must be protected regardless of ownership.	Developing leadership will strengthen the sector and ensure competitiveness globally.	Innovation is fostered through research and development.	Government and industry must work together to ensure communication is informative, timely, and accessible.
Certainty and stability is fundamental for all water users.	Industry has zero tolerance for water theft.	Decision-making must ensure no negative unmitigated third-party impacts, including understanding cumulative and socio-economic impacts.	Irrigation farmers respect the prioritisation of water in the allocation framework.
All water (agricultural, environmental, cultural and industrial) must be measured, and used efficiently and effectively.			Collaboration with indigenous nations improves water management.



Introduction

NSWIC note that the Terms of Reference³ for this Inquiry focuses on a number of individual projects, including: the Wyangala, Mole River and Dungowan Dam projects; the Macquarie River reregulating storage project; the Menindee Lakes Water Savings Project and the Western Weirs project. For these individual projects subject to this Inquiry, NSWIC refer to the submissions of our Member Organisations on the projects within their respective valleys.

The focus of the NSWIC submission will thus be on the later parts of the Terms of Reference, particularly:

“(d) the impacts of climate change on inland waterways, including future projections, and the role of dams and other mass water storage projects in ensuring security of water supply for social, economic and environmental outcomes”

“(f) any other related matter” – which we consider to include the suitability of current water infrastructure to provide a reliable supply of water, now and into the future.

NSWIC recognises that water storages have been, and always will be, a topic of great debate. However, this is an essential conversation to ensuring long term water security for all water users: towns and communities, farming sector, the environment, and First-Nations.

Overview of Key Findings

- 1) Water insecurity has threatened critical human water needs in NSW as recently as the last 12 months, and there is ongoing genuine fear that this will happen again. There is evidently insufficient storage to provide a reliable water supply to ensure basic human needs can be met throughout increasingly long and severe dry periods.
- 2) Water users are concerned that a resistance towards water infrastructure development in recent times has undermined the water security of communities and industry.
- 3) Climate change is currently having, and is projected to continue to have, significant impacts on inland waterways. This means dams and other mass water storage projects will have an ever-increasing importance to ensure the security of water supply for social, economic and environmental outcomes.
- 4) Climate change poses a significant risk to water security for irrigated agriculture. Since the water management framework automatically adjusts water shares to reflect variable climatic conditions, climate change imposes a significant risk on water security due to the warming, drying trends with longer, hotter drier summers interspersed with more intense rainfall events. At risk are long-term entitlement reliability (particularly lower-reliability entitlements), healthy rivers, town water security, and cultural significance for First-Nations.
- 5) NSW legislation prioritises water access to critical human needs and towns, and then the environment, however, in recent times there was simply not sufficient water supply to even meet these top priorities. This shows there is a supply issue.

³ <https://www.parliament.nsw.gov.au/lcdocs/inquiries/2614/Terms%20of%20Reference.pdf>



- 6) Dams have a major and increased role in ensuring security of water supply for environmental outcomes, particularly with increased volumes of held environmental water resulting from recent water recovery reforms, such as the Murray-Darling Basin Plan.
- 7) Water users pay for water infrastructure, including for public interest outcomes - such as fish passage, water storage for environmental water, water supply for towns, flood mitigation and recreation – with a current cost-share ratio of 80% of capital expenses, and 100% of operational expenses.

Submission

Critical Human Needs & Day Zero

It was only months ago that we had (major) towns seriously in fear of running out of water as they approached, and some even reached, ‘Day Zero’. This was an incredibly scary time for people in these communities, and across Australia.

This most recent/current drought in NSW made it obvious that there is insufficient storage to provide a reliable water supply throughout the increasingly long and severe dry periods. The severity of the drought meant that even critical human needs became affected, with many towns (including large towns/cities, such as Armidale and Tamworth) having to seriously consider options for ‘Day Zero’.



Image: [Left] Armidale Regional Council sign for Level 5 Emergency water restrictions (October 2019); [Right] Extreme drought conditions in Northern NSW (October 2019).

To remind the Committee of the sentiment and fear experienced by people during these critical times, the below table captures some of the media commentary.



Table 1: Recent media commentary on water insecurity concerns in NSW

Quote	Source	Date
<p>Gardens are dead, people skip showers and water quality has worsened – the big dry dominates conversation in coffee shops, pubs and homes.</p> <p><i>This is what day zero is like in Australia, as an unprecedented drought leaves 55 towns at risk of running out of water, if they haven't already.</i></p> <p><i>It's forced states and councils to fork out hundreds of millions of dollars on emergency water infrastructure.</i></p> <p>***</p> <p><i>The severity of this drought will likely linger in people's minds even after the drought breaks, changing the way they conserve water in the future.</i></p>	<p>ABC [HERE]</p>	<p>27 January 2020</p>
<p><i>Bushfires and drought leave NSW town of Tenterfield without clean water for 72 days.</i></p>	<p>The Guardian [HERE]</p>	<p>13 December 2019</p>
<p><i>The northern tablelands town of Armidale is looking at the prospect of carting in water on 100 trucks every day if it cannot find ground water before its dam runs dry next year, or unless the drought breaks.</i></p> <p>***</p> <p><i>To supply the 30,000 residents of Armidale and Guyra with 120 litres of water per person per day would require 100 B-double trucks carting it daily. That was about half their usual rate of use. And it did not cover the requirements of the hospital and local businesses.</i></p> <p><i>"Trucking water is going to be the only water solution. But where do you truck it from?," Mr Murray said.</i></p> <p><i>The New England Highway was populated by towns that barely had enough water to supply their residents. But the road to the coast, where water was more plentiful, could not handle the heavy transport.</i></p>	<p>SMH [HERE]</p>	<p>23 October 2019</p>
<p><i>The water supply of some the state's biggest towns has been hit by drought including Armidale, Tamworth, Orange and Dubbo. The Deputy Premier, John Barilaro, warned last week that large NSW towns would struggle to survive if the drought continues for another three years.</i></p> <p><i>Armidale Regional Council says on present usage, water supply from the Malpas Dam will run out in November next year - dubbed "day-zero".</i></p> <p>***</p> <p><i>Mr McTavish said he is working on water security in about 85 towns across NSW. "In all those places there is a risk they will be in critical water shortage in the next 12 months," he said.</i></p>	<p>SMH [HERE]</p>	<p>21 October 2019</p>
<p><i>Six months after Murrurundi's water ran out, the New South Wales Upper Hunter community struggles to survive on extreme, level-six water restrictions.</i></p> <p><i>ANDY PARK: For the residents of Murrurundi, who are now dependent on today's delivery, Day Zero was nine months ago.</i></p>	<p>ABC 7:30 [HERE]</p>	<p>30 September 2019</p>



PHILLIP HOOD, WATER MANAGER, UPPER HUNTER COUNCIL: Typically up to five or six trucks a day. We have two trucks that are operating more or less full-time and have been since January this year.

Day Zero is essentially when the supply at Murrurundi itself was not enough to sustain that minimum demand, that Level 6 demand and that occurred for us in January, 22nd of January and that's when the water carting began.

Finding:

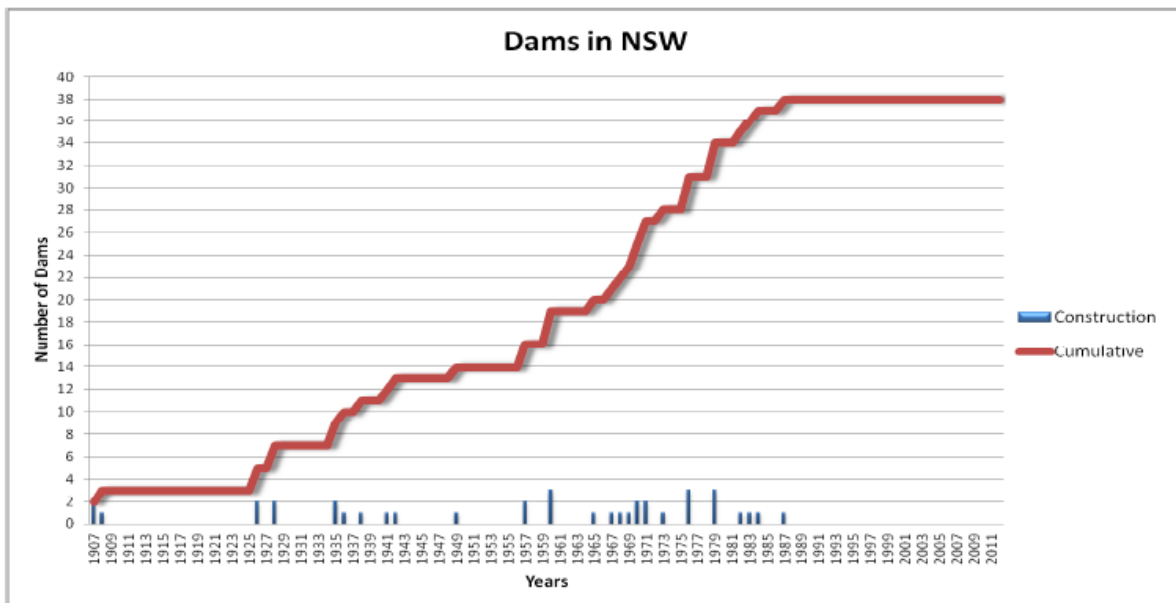
- 1) Water insecurity has threatened critical human water needs in NSW as recently as the last 12 months, and there is ongoing genuine fear that this will happen again. There is evidently insufficient storage to provide a reliable water supply to ensure basic human needs can be met throughout the increasingly long and severe dry periods.

Water supply

NSW progressively increased its water storage capacity, and thus its ability to manage water resources, over an 80 year period (1907-1987), which then effectively stalled until very recently. During this stalled period, there were no major increases in storage capacity approved (dam upgrades were undertaken); whilst the population and thus water demand continued to grow. Water users are concerned that a resistance towards water infrastructure development in recent times has undermined the water security of communities and industry. Ultimately, with increasing demand (from population growth, and to at least maintain, if not grow, agricultural production), increasing supply (i.e. storage capacity) is required.

The below figure shows the trend of dam development in NSW (until 2011). Evidently, the trend flatlines after 1987.

Figure 1: Dam Development in NSW



* Information from State Water - <http://statewater.com.au/Water+delivery/Dams>

Finding:

- 2) Water users are concerned that a resistance towards water infrastructure development in recent times has undermined the water security of communities and industry.



Climate Change

Climate change poses a significant risk to water security for irrigated agriculture and all water users, and is already disrupting water availability. Since the water management framework adjusts water shares automatically to reflect variable climatic conditions, climate change imposes a significant risk on water security due to the warming, drying trends with longer, hotter drier summers interspersed with more intense rainfall events. At risk are long-term entitlement reliability (particularly lower-reliability entitlements), healthy rivers, town water security, and cultural significance for First-Nations.

The Inspector-General of Murray-Darling Basin Water Resources identified the impacts of climate change on water resources as part of a recent report, titled *‘Impact of lower inflows on state shares under the Murray-Darling Basin Agreement’*. The report noted:

*“Median inflows into the Menindee Lakes have reduced by about 80% in the last 20 years relative to the recorded period prior. Eight of the 13 driest years on record occurred in this period, most yielding zero or close to zero inflows. Although years of low inflows to the Menindee Lakes are common in the historical record, the dry years in the past two decades have been much more severe.”*⁴

*“While there may be many factors contributing to the extent of observed inflow reductions, the lack of rainfall and runoff has been the primary driver for the conditions being experienced by many across the Basin in recent times.”*⁵

*“Median inflows upstream of Albury have decreased by about one third in the past 20 years compared with the preceding century, while half of the driest years on record have occurred in the past 25 years.”*⁶

“Median inflows in the NSW tributaries have reduced by almost two-thirds over the past 20 years compared with the preceding century.”

The MDBA have also identified in a recent Climate Change Discussion Paper⁷, that:

*“Climate change is expected to impact water availability in the Murray–Darling Basin, and the communities, businesses and ecosystems which depend on them (CSIRO, 2008; MDBA, 2010; CSIRO et al., 2016; Steffen et al., 2018)”*⁸

*“The impacts of climate change on Basin water resources are wide ranging and significant. Higher average temperatures will increase the amount of water lost to evaporation and reduce soil moisture. This means more rainfall will be absorbed into the soil, resulting in less runoff, reduced river flows and less water being stored and regulated by dams.”*⁹

*“Higher temperatures are also expected to lead to an increased dependency on river flows, as crops and native vegetation have less access to soil moisture and suffer increased losses from transpiration.”*¹⁰

⁴ Ibid [P 12].

⁵ https://www.igmbd.gov.au/sites/default/files/documents/iig_final_report.pdf [P 8].

⁶ Ibid [P 9].

⁷ Murray Darling Basin Authority (February 2020), “Climate change and the Murray-Darling Basin Plan”. <https://www.mdba.gov.au/sites/default/files/pubs/Climate-change-discussion-paper-Feb-19.pdf>

⁸ Ibid [P 4].

⁹ Ibid [P 9].

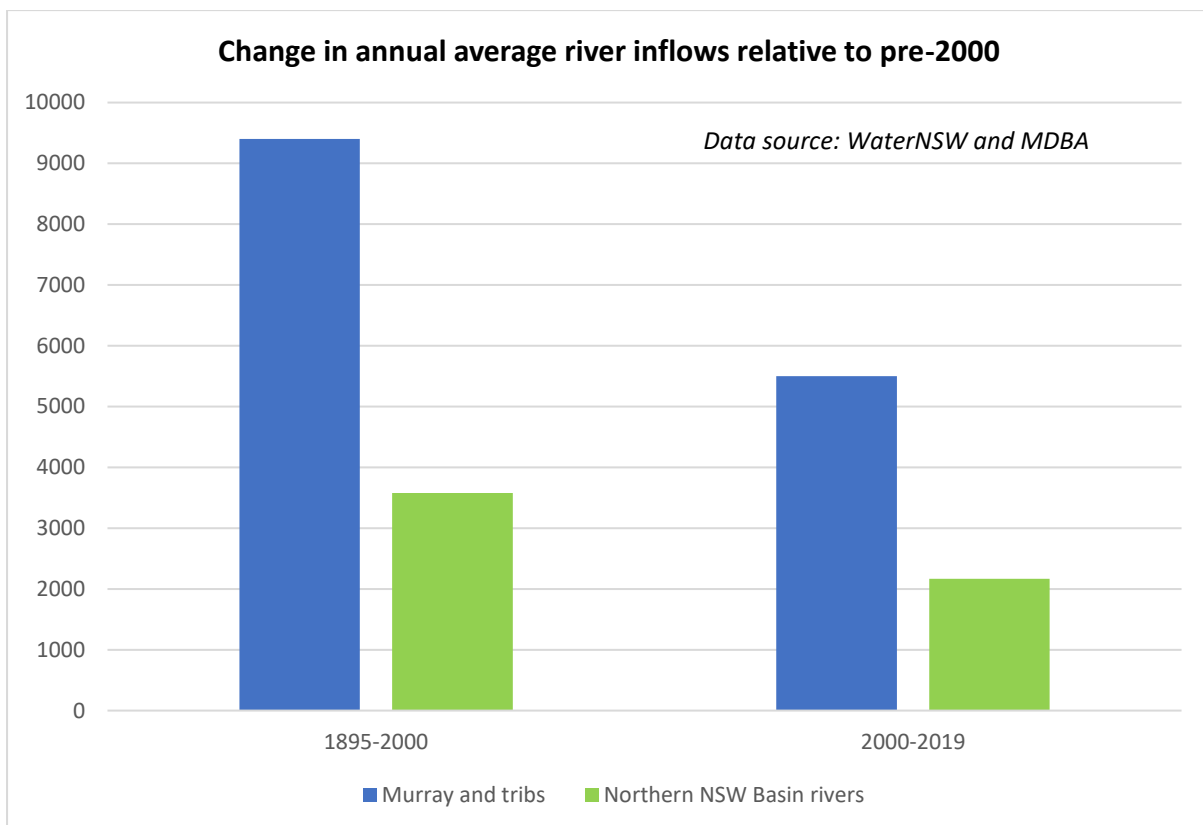
¹⁰ Ibid [P 9].



“The risks identified have significant consequences for the environmental health of the Murray– Darling Basin. This is also true for the communities living in the Basin, and the industries and agribusinesses reliant on the river system for their water supply.”¹¹

NSWIC has developed the below figure to illustrate the impacts of climate change on water resources, based on WaterNSW data of all inflows into dams and tributaries in the northern Basin rivers back to 1895. This graphic resembles the graphic in the Inspector-Generals recent report¹². Whilst Australia’s rivers are characterised by boom and bust cycles, and averages of this kind show only a general trend, it is certainly an alarming trend which can be observed.

Figure 2: Changes in annual average river inflows relative to pre-2000



With climatic trends forecasting not only declines in average inflows, but longer dry periods, it will become increasingly important for water infrastructure to be suitable to greater fluctuations in boom and bust cycles. In short – this means having water infrastructure that can store sufficient water during wet times, to use it throughout the length of the dry period. Not only is this required for water security, but it also reduces the reliance on river flows during critically dry periods.

Finding:

- 3) Climate change is currently having, and is projected to continue to have, significant impacts on inland waterways. This means dams and other mass water storage projects will have an ever-increasing importance to ensure the security of water supply for social, economic and environmental outcomes.

¹¹ Ibid [P 10].

¹² https://www.igmdb.gov.au/sites/default/files/documents/iig_final_report.pdf [P 8].



- 4) Climate change poses a significant risk to water security for irrigated agriculture. Since the water management framework adjusts water shares automatically to reflect variable climatic conditions, climate change imposes a significant risk on water security due to the warming, drying trends with longer, hotter drier summers interspersed with more intense rainfall events. At risk are long-term entitlement reliability (particularly lower-reliability entitlements), healthy rivers, town water security, and cultural significance for First-Nations.

NSW legislation and water priorities

It would be unconstructive for conversations around securing critical human needs to focus on irrigated agriculture. Firstly, many of the towns severely impacted by recent water insecurity were towns not in or downstream of dominant irrigated agriculture regions (such as Armidale at the top of the Great Dividing Range). Secondly, under NSW legislation, there is a clear order of priority in water access, with critical human needs at the top, and general security licences at the very bottom. Water allocations against general-security entitlements are only made available when higher priority needs have been satisfied. Our industry respects this hierarchy of water access and this respect is a guiding principle of NSWIC. It is untenable (and incorrect) to think that reducing access at the bottom of the hierarchy will make more water available at the top of the hierarchy.

Water Management Act 2000 No 92 [NSW]

60 Rules of distribution applicable to making of available water determinations

(3) While an order under section 49A is in force, the following rules of distribution apply to the making of an available water determination—

- (a) first priority is to be given to—*
- (i) the taking of water for domestic purposes by persons exercising basic landholder rights, and*
 - (ii) the taking of water for domestic purposes or essential town services authorised by an access licence,*
- (b) second priority is to be given to the needs of the environment,*
- (c) third priority is to be given to—*
- (i) the taking of water for stock purposes by persons exercising basic landholder rights, and*
 - (ii) in the case of regulated rivers, the taking of water for purposes (other than domestic purposes) authorised by a regulated river (high security) access licence, and*
 - (iii) the taking of water for the purposes of supply of commercial and industrial activities authorised by a major utility access licence or local water utility access licence, subject to the water made available being in accordance with any drought management strategy established by the Minister for that purpose, and*
 - (iv) the taking of water for the purposes of electricity generation authorised by a major utility access licence, and*
 - (v) the taking of water for purposes authorised by a domestic and stock access licence or by persons exercising any other water rights in relation to stock, and*
 - (vi) the taking of water for purposes authorised by a conveyance access licence in connection with the supply of water for any other purpose or need referred to in this paragraph,*



(d) fourth priority is to be given to the taking of water for purposes authorised by any other category or subcategory of access licence.

(3A) While an order under section 49B is in force, the following rules of distribution apply to the making of an available water determination—

(a) first priority is to be given to meeting critical human water needs,

(b) second, third, fourth and fifth priorities are to be given to the matters set out in subsection (3) (a), (b), (c) and (d), respectively, to the extent that those matters are not critical human water needs.

Finding:

- 5) NSW legislation prioritises water access to critical human needs and towns, and then the environment, however, in recent times there was simply not sufficient water supply to even meet these top priorities. This shows there is a supply issue.

Environmental Water

NSWIC note that water storages in NSW are used for a variety of purposes, including to store environmental water. In recent times, with reforms such as the Murray-Darling Basin Plan increasing volumes of held environmental water, NSW dams have a major role in ensuring security of water supply for environmental outcomes. This means that dams have a major role in ensuring security of water supply for environmental outcomes.

Finding:

- 6) Dams have a major and increased role in ensuring security of water supply for environmental outcomes, particularly with increased volumes of held environmental water resulting from recent reforms, such as the Murray-Darling Basin Plan.

Costs

Whilst productive water users in-principle welcome new water infrastructure which improves water security and reliability, it must be noted that at present, water users are the ones paying for them on behalf of the general public. Specifically, the current cost-share ratio has water users paying 80% of capital expenses, and 100% of operational expenses. This is despite water infrastructure serving a broad range of public interest benefits, including water supply for towns, water storage for environmental water, fish passage, flood mitigation and recreation.

NSWIC seeks a fairer cost-share ratio that is reflective of the public interest benefits, currently funded by water users.

Further information can be found in the NSWIC submissions to the NSW Independent Pricing and Regulatory Tribunal (IPART), available on our website, and upon request.

Finding:

- 7) Water users pay for water infrastructure, including for public interest outcomes - such as fish passage, water storage for environmental water, water supply for towns, flood mitigation and recreation – with a current cost-share ratio of 80% of capital expenses, and 100% of operational expenses.

Recommendation:

NSW adopt a cost-share ratio that accounts for public interest benefits from water infrastructure.



Conclusion

Water security is a pivotal issue for Australia, and water infrastructure is an incredibly important component of addressing contemporary water security challenges. There is a fundamental equation that must be balanced by water infrastructure in NSW – supply must be in equilibrium with demand.

With Australia's predicted population growth, the increased demand for food production and an overall need for more fresh water, we must address the ever-increasing need for greater security of our water resources.

Water storage is important to all water users – the environment, the agricultural sector, and towns. A water infrastructure network unable to supply sufficiently to meet water demand, must be a critical concern for everyone.

From the perspective of the irrigated agriculture sector, water security is at the very foundations of a secure, sustainable and productive industry.

NSWIC and our members are available at your convenience, if you have any questions or would like any further information.

Kind regards,

NSW Irrigators' Council.