



Submission to PC Inquiry

National Water Reform 2026

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CEG RESEARCH PROVIDES IMPORTANT INSIGHTS ON WATER REFORM GOVERNANCE

The Centre for Environmental Governance (CEG) at the University of Canberra is an interdisciplinary research centre focused on how governance systems, legal, institutional and social, shape the management of natural resources and the environment. Our research intersects law, policy, social science and ecology, and includes a focus on water governance and management, and its impacts for communities.

Recent CEG research on water governance in Australia underpins this submission. Importantly this research provides insights relevant to the framing of the renewal of the National Water Initiative (NWI), including:

1. Critical analysis of the extent to which siloed governance systems for key resources within social-ecological systems have limited effective adaptive management or have the capacities needed to anticipate and manage diverse drivers of change (Pearson and Mummery 2025)
2. Deep insights into community understanding and perceptions of the impacts of water governance, governance reforms, and challenges such as climate change, including whether the values the Australian community holds for water management and governance are being fulfilled, and how they are being challenged by increasing natural hazards in a changing climate (Schirmer et al. 2025)

3. Longitudinal analyses of diverse community experiences of water reform, at a scale not typically seen in water policy analysis, identifying, for example, increasing challenges and concerns of remote area capacities, and concerns about insufficient attention to consistency, equity and transparency (Schirmer et al. 2025)
4. The evidence base needed for effective reform implementation, spanning anticipatory mechanisms, robust science-practice interfaces, an understanding of the operation of drivers of change on policy goals, and integrated indicators that can position resource change within a wider systemic and driver of change context (Pearson and Mummery 2025; Mummery and Pearson 2026)
5. Fairness, justice and equity dimensions of governance, policy and implementation approaches, including the extent to which governance systems can exacerbate or ameliorate challenges for certain communities, and the value of integrating insights from First Nations peoples in governance systems (Schirmer and Mylek 2020; Alluvium and NCE 2022).

Collectively this research contributes to understandings on the Productivity Commission's National Water Reform 2024 Inquiry Report findings concerning inadequate environmental outcome reporting and the absence of independent review (Findings 7.1–7.3), forward reform priorities, and concerns about remote areas and consistency, equity and transparency (Findings 9.1, 9.2, 7.1-7.3).

This submission addresses Part A of the inquiry across three sections:

1. **Barriers and emerging risks** – responding to Question 2
2. **Forward reform priorities** – responding to Question 3
3. **Key points in summary**

Full references are provided at the end of this submission.

We welcome the opportunity to contribute to the current Productivity Commission's review and are available to clarify any points from the submission with the Commission.

PART A: NWI ASSESSMENT

Q2: Barriers and emerging risks (policy, legislative, regulatory, governance barriers; emerging risks over next 3 years)

There is a strong body of evidence that multiple barriers and emerging risks are constraining the achievement of NWI goals, including for a nationally-compatible, market, regulatory and planning based system of managing surface and groundwater resources for rural and urban use that optimises economic, social and environmental outcomes, and that addresses future adjustment issues that may impact on water users and communities. Water resources in Australia are subject to powerful drivers of change, and governance systems that are insufficiently informed by influential drivers of change, cross-scale dynamics, thresholds of change, and the trade-offs between competing values can fail to enable proactive decision-making for the economic, social and environmental sustainability of water resources, catchments and basins (Mummery and Pearson 2025). CEG research identifies three key barriers and emerging risks in water resource governance that need attention in the near future: (i) growing climate volatility and climate change, (ii) coordination gaps and weaknesses in current governance, and (iii) increasing concerns about fairness and equity (Mummery and Pearson 2025, Pearson and Mummery 2025, Schirmer et al. 2025, Schirmer and Peel 2020).

The Productivity Commission in its National Water Reform 2024 Inquiry Report (PC 2024) identifies that effective community engagement is an essential supporting arrangement for a renewed NWI. Understanding this, CEG research drawing on the long-standing data collection in the Regional Wellbeing Survey, reported across multiple reports, enables examination of how water users perceive and are affected by water governance reforms (e.g. Schirmer and Peel 2020). In addition, the *Basin Community Values* project undertaken in 2025 enabled evaluation of community views about whether NWI goals are being achieved successfully, with Australians views on current water governance and management assessed nationwide as well as specifically within the Murray–Darling Basin (Schirmer et al. 2025).

(i) Growing climate volatility and climate change

While some adaptive capacities have been integrated into water governance in Australia, including regular reviews, science - policy interfaces such as advisory committees, and monitoring and evaluation processes, current NWI governance approaches are poorly prepared to cope with the nature and magnitude of projected climate change with its increasing climate volatility and damaging extreme weather events (Mummery and Pearson 2025). Of concern, historic climate and hydrology data continue to be used to inform key water regulation and decision making, such as diversion limits in the Murray–Darling Basin, and in typical water availability risk and flow assessments.

With increasing climatic variability across Australia due to a changing climate already being observed,

and many in rural communities experiencing more frequent and intense natural hazards, it is important that water governance be fit for purpose for managing water resources through changing natural hazards that affect water quality and quantity. Across Australia, 53.0% of those living in regional areas are concerned that a changing climate may reduce the amount or quality of water available in their local region. At the same time some 58.7% felt confident that their community would have sufficient long-term quantity and quality of water to meet their needs (Schirmer et al. 2025). Of particular concern is evidence that gives only low confidence in the capacity of current adaptations to manage water resources effectively in a changing climate, with only 26.8% feeling their community was well placed to cope with the impacts of increased extreme weather events resulting from climate change. Specifically, the *Basin Community Values* report found that only 39.1% of Murray–Darling Basin residents felt that water governance is designed well to manage floods, and 32.3% that is designed well for drought, similar to findings amongst Australians living outside the Basin.

(ii) Coordination gaps and weaknesses in current water governance

The importance of cooperation is also identified by the Productivity Commission in its National Water Reform 2024 Inquiry Report (PC 2024). CEG research highlights the centrality of robust approaches to coordination for effective water governance. The Murray–Darling Basin is a complex socio-ecological system in which siloed governance – separating land from water, environmental management from

BOX 1

Case example: What genuine coordination delivers – the Renmark model

The RAD case studies provide direct, measurable evidence of what system coordination achieves when it is formally structured. The Renmark Irrigation Trust's partnership with the Commonwealth Environmental Water Holder – the world's first platinum-level Alliance for Water Stewardship certification – demonstrates that irrigation infrastructure management and environmental water delivery can be jointly coordinated to produce outcomes neither achieves alone (Pearson and Mummery 2025).

The partnership delivered over 74,000 megalitres to 215 wetlands supporting 113 native plant species, 126 bird species, and 11 frog species, using existing infrastructure during off-peak periods at low cost and with measurable improvement to irrigation reliability. This is precisely the kind of outcome the PC 2024 found to be under-reported (Findings 7.2–7.3) – yet here the coordination framework made outcomes not only achievable but independently verifiable. The model is replicable. The NWA's action planning process should explicitly identify formal irrigation-environmental water coordination arrangements of this kind as a mechanism for achieving its interconnected water management objective.

regional economic policy, and local decision-making from Basin-scale planning – is itself a primary driver of poor outcomes (Mummery and Pearson 2025). The PC 2024 identified that environmental outcomes are inconsistently specified (Findings 7.1–7.3) and that independent review is absent (Finding 7.3); CEG argues that these are symptoms of a deeper structural problem: the NWI did not establish coordination mechanisms across regulatory domains, and current arrangements do not require economic regulators, environmental water managers, and land-use planners to work from a shared evidence base or shared indicators.

CEG's Resilience, Adaptation and Drivers of Change indicator framework analysis identifies four specific gaps in current monitoring – system interdependencies across domains, cross-scale linkages between local and Basin dynamics, early warning thresholds, and external driver tracking – that could serve as a practical diagnostic tool for jurisdictions designing coordination mechanisms under the National Water Agreement's (NWA) action plan process (Pearson and Mummery 2025). A case example of what can be achieved with genuine coordination follows in Box 1. The NWA's objective of water planning that is "interconnected, adaptive and responsive to climate change" likely cannot be achieved without first addressing this architecture.

Concerns about weaknesses in water governance coordination are also apparent at community scales. There is currently low community confidence in the ability of governments to effectively govern water and to work together in doing so. The *Basin Community Values* project found that only 7.4% of those with an interest in water management are confident that water managers work well together across state/territory borders. Even within jurisdictions, few – 15.7% - feel confidence that the different agencies who have responsibilities for water work well together. Confidence that people who break water regulations and laws will be identified and face consequences is also low, with only 23.9% confident that those who do the wrong thing when managing water get found out, and only 22.9% feeling those who are found out will face consequences for breaking laws and regulations. While 50.8% of those with an interest in water management felt water governance was moderately to highly effective, lack of confidence in government capacity and ability to work effectively both within and across jurisdictions is a key risk to future efforts for nationally coordinated water management.

Further, a lack of consistency in monitoring and reporting of water quality in both domestic water supply, and in waterways and water storages, is a key issue reducing accountability and good governance. Multiple studies have identified a lack of consistent, nationally coordinated water quality data as a key gap in water governance (see, for example, Schirmer et al. 2025). Lack of visibility of this information is a governance and accountability failure that reduces ability to effectively engage in planning for and investing in future needs, particularly as a changing climate presents increasing challenges to maintaining sufficient quality and quantity of water supply to all Australian households.

(iii) Increasing concerns about fairness and equity

A key emerging risk for further water governance developments is concerns about the fairness of water governance implementation. Of over 1,500 Australians with a self-reported interest in water management surveyed as part of the Regional Wellbeing Survey, only 38.9% feel water regulations are designed and communicated well, and only 25.7% feel rules about how water can be accessed and used for irrigated agriculture (the largest water user nationally) are fair in their region. As of 2023, 37.5% of water licence holders in the Murray–Darling Basin felt their rights to access water were secure, suggesting ongoing difficulty meeting the objectives of the NWI regarding secure water rights that support investment and innovation.

The continued relative exclusion of First Nations peoples from water governance represents the most serious equity failure within the current NWI framework. Existing water reform processes and trading systems risk embedding historical power imbalances, with minimal allocation of water for cultural, social and economic purposes and limited recognition of First Nations rights and governance roles. There is a clear misalignment between NWI implementation and the National Agreement on Closing the Gap (2020), whose four Priority Reforms explicitly commit governments to: establishing formal partnerships and shared decision-making; building community-controlled sectors; transforming government organisations to work better for First Nations peoples; and improving data access to enable informed community decision-making. Current water governance arrangements satisfy none of these commitments adequately.

Redressing this requires a fundamental shift in approach – one grounded in the principle of "nothing without us." This means moving well beyond consultation to recognition of First Nations peoples as core contributors to system design, decision-making and investment priorities, and weaving connected systems knowledge – cultural flows, base flows, ecosystem connectivity – directly into mainstream water planning rather than isolating these perspectives in standalone chapters. Failure to do so represents an emerging risk to the legitimacy, trust and long-term effectiveness of national water reform, and a failure to recognise potential benefits (Thompson et al. 2024; Alluvium and NCE 2022).

Another dimension of fairness and equity issues concerns how water market reforms are being implemented and whether it enables easy use of water trading by all. Many regional Australians feel that water sharing and governance arrangements are not working well for them. Schirmer and Peel (2020) found both positive and negative outcomes of water trade reforms in their examination of irrigator experiences of water markets, based on 2016 and 2018 data. While many irrigators had been able to use water trading, around one in four living in regions where water trade was possible reported difficulty engaging with water markets. As of 2023, findings were similar amongst those with an interest in water trade (Schirmer et al. 2025): only 28.9% reported finding it easy to access the information needed to make water trading decisions, only 19.9% were confident in the stability of water market rules, and only 13.8% felt the water trade market was fair for all users. However,

more than one in three reported finding it easy to trade water allocation and entitlements (most located in the southern Murray–Darling-Basin), indicating that efforts to create improved access to water trade have been effective in enabling trade in some regions, but still have some way to go to achieve the widespread ease of access intended through enactment of market reforms.

Q3: Forward reform priorities (1-3 priorities most likely to improve outcomes over next 3 years)

Drawing on long term surveys of community attitudes, in-depth engagement of practitioners on water governance issues, and a synthesis of key scholarly literature on resilience, adaptation and drivers of change in the Murray–Darling-Basin, CEG suggests there are three key areas of national priority for water governance reform: (i) to urgently embed climate adaptation into water governance; (ii) to develop effective governance for the growing water quality challenges across Australia, and (iii) to embed systemic ‘people and place’ approaches across all water governance.

(i) Urgently embed climate adaptation into water governance frameworks – governance is running behind the climate

CEG’s Resilience, Adaptation and Drivers of Change practitioner survey undertaken in 2025 (n=134) produced a strong finding that climate variability and change has displaced Basin water governance and water policy from the top of Basin practitioners’ concerns, ranking as the *single most important driver of change for the next 20 years*. This is a significant shift from historical patterns. Strikingly, whilst economic, governance, and social drivers were assessed as having *mixed* impacts across the Basin, environment and climate drivers were rated as having *consistently negative* impacts across all four sub-basins – the only driver category with this profile (Pearson and Mummery 2025; Mummery and Pearson 2026). The literature synthesis explains why: the MDB’s temperature has already risen approximately 1.4°C over the past 100 years, streamflow records show a declining trend over 50 years, and hydroclimate modelling projects a median reduction of approximately 20% in mean annual runoff by 2060 under 2°C of global warming, with 3-year droughts projected to occur up to twice as frequently (Mummery and Pearson 2025). As noted earlier, the synthesis also concludes that “many policies and regulations still assume a static climate and will not be fit for purpose in the future.” The Outlook Future Conditions Report (Cheesman et al., October 2025), drawing directly on CEG’s Resilience, Adaptation and Drivers of Change research, confirms this finding at the Local Government scale: in the southern Basin, runoff reductions of 20–40% are projected under the 90th percentile scenario, with northern Basin beef enterprises facing modelled profit declines of 15–50% under high-emissions scenarios (RCP8.5). Governance reform requiring explicit climate risk assessment and adaptive management triggers within water resource plans would directly address this deficit. It is achievable within a three-year period and is the single most impactful reform available.

The concerns of professionals are echoed by a growing proportion of regional Australians. As noted earlier, a nationwide survey found that 53.0% of those living in regional areas are concerned that a changing climate may reduce the amount or quality of water available in their local region. While most felt confident in long term water supply, confidence was much lower in ability to manage water effectively during periods of high variability – droughts and floods – with only 26.8% feeling their

community was well placed to cope with the impacts of increased extreme weather events resulting from climate change (Schirmer et al. 2025).

There is a clear need to more specifically design water governance actions with consideration of the growing frequency of extreme low and high water flow events (drought and flood), and ongoing climate change. Importantly, governance reform needs to both enable governance frameworks to be climate adapted and adaptive, and support well adapted communities. Adaptive capacity is not evenly distributed across the Basin – and current governance has not yet responded to this unevenness, leaving a risk of increasing inequity in a changing climate. The Outlook Vulnerability Assessment Report (Cheesman et al., May 2025), drawing on our Drivers of Change work and a five-study cluster-based meta-analysis, classifies 40 Basin Local Government Areas – including Bourke, Paroo, Wentworth, Balonne, Gwydir, Liverpool Plains, and the Coorong – as small, remote, and highly vulnerable (Cluster 5): characterised by high agricultural dependence, low economic diversity, and limited adaptive capacity. The Outlook Future Conditions Report (Cheesman et al., October 2025) finds that 12 of these LGAs are simulated to *worsen* their vulnerability classification by 2051 under current trends, with expert elicitation finding that without a "fundamental shift in how land and water are managed, grounded in adaptive, inclusive, and anticipatory governance, the Basin faces a trajectory of ecological decline, social fragmentation, and economic polarisation."

(ii) Establish integrated, cross-jurisdictional water quality monitoring with early warning capability

Water quality is not a future risk in the Murray–Darling-Basin – it is a present and worsening challenge. CEG's Resilience, Adaptation and Drivers of Change survey found strong consensus across all four sub-basins that sedimentation, algal blooms, and hypoxic water events are already increasing, and that respondents expect these trends to continue or intensify over the next 20 years (Pearson and Mummery 2025). The Lower Murray was specifically identified as the sub-region facing the most severe water quality challenges of any part of the Basin. The literature synthesis provides the mechanistic explanation: climate change will increase the frequency, duration, and scale of blue-green algal blooms and hypoxic events – threatening the persistence of freshwater fish species, with some evidence of emerging links to long-term human health impacts – while systemic events such as bushfires and extreme heat will generate compounding water quality effects through altered catchment vegetation and hydrology (Mummery and Pearson 2025).

Some regional areas also report consistently poor access to domestic water supply that it fit for use. In areas such as Bogan, Bourke and Brewarrina in New South Wales (NSW), only 41.0% of residents report having good quality domestic drinking water. In several other western NSW communities, more than 30% of residents lack access to sufficient drinking water – including many living in towns with connections to mains water supply (Schirmer et al. 2025, p. 39). The NWI agreement noted that full cost recovery was not always a feasible model for domestic water supply in some regional communities. Significant ongoing failure in ability to supply sufficient quality and quantity of domestic

water in key rural communities highlights a lack of governance to ensure all communities have access to what should be a basic right.

The Murray Darling Basin Authority's (MDBA) 2025 Outlook Vulnerability Assessment Report, which drew directly on CEG's Drivers of Change research, confirms that "climate variability, invasive species, and water quality" are "critical, interconnected challenges" whose impacts on Basin water assets cannot be addressed in isolation (Cheesman et al., 2025, p. 36). Despite this evidence base, water quality outcome reporting remains fragmented and jurisdiction-specific – confirmed by the PC's own 2024 findings (Findings 7.1–7.3). The Resilience, Adaptation and Drivers of Change indicator framework's analysis specifically identifies the absence of cross-scale, integrated monitoring with early warning thresholds as one of four critical gaps in current MDBA frameworks (Pearson and Mummery 2025). Establishing shared, cross-jurisdictional water quality indicators within three years, with real-time threshold monitoring built into water resource plans, would close this gap and directly advance NWI environmental outcome objectives.

(iii) Embed systemic 'people and place' approaches across water governance

The two reform priorities above address climate adaptation and water quality as technical and institutional challenges, including to governance based on assumptions of historic or unchanging climate. Both, however, ultimately affect, and depend upon, the communities that live within and across catchments. A third, integrating priority is needed: a systemic shift toward governance that treats people and place as inseparable from water system management, and that designs reform accordingly.

Current governance silos separate land from water, infrastructure from social outcomes, and regional economic policy from Basin-scale planning. The costs of this fragmentation are not abstract. Improved water availability and system connectivity are directly linked to reduced health service demand, lower interaction with justice systems, and stronger school attendance in underserved communities (Alluvium and NCE 2022). These outcomes cannot be reached through water planning alone, but neither can they be reached without it. The NWA's action plan process provides a concrete mechanism to require that water, land-use, infrastructure and community wellbeing decisions are made within a shared framework rather than sequentially and in isolation. Examples of connected practices are emerging, for example, the Northern Basin Connectivity program aims to improve water flows for critical human and environmental needs, to support recovery post-drought, to reduce adverse water quality risks and to support fish migration. The Expert Panel Report to this program recognised that poor connectivity is having severe impacts on ecosystem health and downstream communities, that current rules are jeopardising social and environmental needs, and that insufficient progress has been made in improving connectivity outcomes (Dula et al. 2024).

BOX 2

Infrastructure renewal as a test case for systemic people-and-place governance

Ageing water infrastructure in regional and remote Australia illustrates what is at stake when systemic approaches are absent. Infrastructure decisions are routinely treated as asset management questions, when they are in practice decisions about community viability, health, housing security, cultural continuity and environmental health. The evidence is stark: in communities such as Bogan, Bourke and Brewarrina, only 41.0% of residents report access to good quality domestic drinking water – including many connected to mains supply (Schirmer et al. 2025). Without pricing protections and transitional cost arrangements, infrastructure upgrades can worsen affordability for the communities they are intended to serve, compounding existing inequities for pensioners and low-income households in inland and western regions (Infrastructure Australia 2022).

While water infrastructure, which has sought to uncouple water and climate, has delivered a legacy boon economically and socially, and has been the dominant driver of change to natural water flows and water quality historically and in the present, infrastructure renewal provides opportunities to address some of the environmental degradation that has resulted (Pearson and Mummery 2025). New engineering standards are needed, that can enable ecosystem outcomes such as fish ladders and drive use of cold-water pollution control devices etc. There are also opportunities in decommissioning infrastructure and in learning from infrastructure management approaches in other countries, for example, the United States has a periodic reviews and updates of major water infrastructure licensing every 30 years (Federal Energy Regulatory Commission hydropower relicensing). Further, recent public infrastructure investment on farm has polarised community views. An open evidence-based information and dialogue to clarify hydrological outcomes and public vs private benefit is needed for future initiatives.

A people-and-place framework would require that any infrastructure renewal decision be assessed against its social, cultural, environmental and economic consequences for the whole community, Indigenous and non-Indigenous residents alike, alongside its technical performance. This is not a more complex standard; it is a more honest one. It reflects the actual function that water infrastructure serves in regional communities and positions investment as an enabler of climate resilience and equity, not merely an asset replacement cycle.

Key points in summary

CEG research across water governance, community resilience and social-ecological systems provides an integrated evidence base directly relevant to the renewal of the National Water Initiative. Three barriers and three forward priorities emerge clearly from this work.

On barriers and emerging risks, the evidence identifies:

- **Climate volatility is outpacing governance.** Water resource plans continue to rely on historic climate and hydrology data that are no longer fit for purpose. With median annual runoff projected to fall by approximately 20% by 2060 and drought frequency increasing, governance frameworks that assume a static climate represent a growing systemic risk – particularly for the 40 Basin LGAs already classified as small, remote and highly vulnerable.
- **Coordination failures are structural, not incidental.** Siloed governance, separating land from water, environmental management from regional economic policy, and local decision-making from Basin-scale planning, is itself driving poor outcomes. Low community confidence in cross-jurisdictional cooperation (7.4%) and inter-agency effectiveness (15.7%) reflects a governance architecture that has not kept pace with the complexity it is asked to manage.
- **Fairness and equity concerns are deepening.** Only 25.7% of those surveyed feel water access rules for irrigated agriculture are fair in their region. Water markets continue to present barriers for many users, and the ongoing exclusion of First Nations peoples from genuine decision-making roles represents the most serious equity failure in current NWI implementation, and an emerging risk to its legitimacy.

On forward reform priorities, CEG recommends:

- **Urgently embed climate adaptation into water governance frameworks.** Explicit climate risk assessment and adaptive management triggers should be required within all water resource plans. This is achievable within three years and is the single most impactful reform available. Adaptive capacity must also be supported where it is weakest in small, remote and economically vulnerable communities.
- **Establish integrated, cross-jurisdictional water quality monitoring with early warning capability.** Water quality is a present and worsening challenge, not a future risk. Fragmented, jurisdiction-specific reporting must be replaced by shared indicators and real-time threshold monitoring built into water resource plans, particularly for the Lower Murray, and for communities currently lacking access to safe domestic water supply.
- **Embed systemic people-and-place approaches across water governance.** Water, land-use,

infrastructure and community wellbeing decisions must be made within a shared framework rather than in isolation. Infrastructure renewal, including in communities where mains-connected households still lack adequate drinking water, is a test case: unless governed through a whole-of-community lens, with pricing protections and shared outcomes for Indigenous and non-Indigenous residents alike, investment risks deepening the inequities it is intended to address.

Underpinning all three priorities is the need for a governance architecture that is anticipatory rather than reactive, coordinated rather than siloed, and genuinely inclusive of the communities, particularly First Nations peoples and remote and regional Australians, whose lives depend most directly on how water is managed.

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