# Submission to the 2026 Murray–Darling Basin Plan Review

Public Consultation — Discussion Paper Response

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## Preamble: Who Is Making This Submission and Why It Matters

I am Professor Emeritus of Systems at The Open University (UK) and a Visiting Professor at the University of Technology Sydney (UTS). From 2008 -15 I was also Professor, Systems for Sustainability within Monash Sustainability Institute, Monash University, Australia where I established and ran the Systemic Governance Research Program. My research field is systems praxeology — the theory-informed practical action arising from systems thinking — with a particular focus on institutional innovation and systemic governance of water and other social-ecological systems. I have been engaged with governance of the Murray–Darling Basin (MDB) as both researcher and practitioner for over two decades, including conducting action research commissioned directly by the Murray–Darling Basin Authority (MDBA) in 2009, presenting to the House of Representatives Standing Committee on Regional Australia on the Basin Plan in 2011, and publishing extensively on MDB governance in peer-reviewed journals. A full list of relevant publications and presentations is appended.

A foundational distinction running through this submission is between systemic and systematic thinking and practice (Ison, 2010/2017, Systems Practice: How to Act). Systematic thinking and practice is linear, unicausal, sequential and reductionist — it breaks problems into parts and assumes the whole can be understood by analysing them separately. It is the dominant mode in current MDB governance: compliance checklists, step-by-step implementation plans, target-setting and measurement regimes. Systemic thinking and practice, by contrast, is relational, dynamic, circular and recursive — it attends to feedback, emergence, co-evolution and the interactions between parts that produce behaviours no single part can explain. These are not merely different intellectual preferences; they produce fundamentally different governance capabilities. The MDB's challenges — a changing climate, contested values, jurisdictional complexity, ecological non-linearity — are irreducibly systemic in character. Governing them requires systemic, not merely systematic, capabilities. This submission argues that the 2026 Review must actively build these.

My central concern is not any single substantive water issue in isolation — environmental flows, fish kills, salinity, or water trading — but rather the quality of governing that determines whether any plan for the Basin can succeed over time. Many scholars now regard governance as the primary failure in river basin management globally (Bouckaert et al., 2021). This submission argues that the 2026 Review must place effective systemic governing — not simply updated governance structures — at the heart of its recommendations.

I note with concern that the MDBA Discussion Paper, while covering substantive issues comprehensively, does not include governance and governing as an explicit theme. This omission replicates a persistent pattern in MDB reform since at least 2007, and it is a pattern that has contributed to the very difficulties the Review now seeks to address. My submission is structured to be directly useful to those who will read, categorise and synthesise submissions — including through

any AI-assisted thematic analysis. I therefore organise my response around the Discussion Paper's own chapter structure while making the cross-cutting governance argument explicit throughout.

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## 1. The Foundational Problem: Governing versus Governance

The most important conceptual distinction for the 2026 Review is between governance (static structures, institutions, rules, legislation) and governing (the dynamic, ongoing process of steering a viable course through feedback between social and ecological systems). Australia's MDB policy since the Water Act 2007 has invested heavily in governance — creating the MDBA, the Commonwealth Environmental Water Holder, Water Resource Plans, and Sustainable Diversion Limits — but has invested far less in the processes of governing: the active, adaptive, learning-capable processes through which governance structures are brought to life.

This distinction maps directly onto the systemic/systematic contrast noted in the Preamble. Governance structures — Acts, authorities, plans, limits — are the products of systematic design: specified, bounded, measurable. The process of governing requires systemic capability: the capacity to detect and respond to feedback, to hold multiple perspectives, to adapt as conditions change, and to navigate the circular, recursive dynamics of a social-biophysical system that is always already changing. The Basin Plan has been strong on the former and consistently weak on the latter.

This distinction is not merely academic. As argued in Ison, Alexandra and Wallis (2018, *Sustainability Science* 13: 1209–1223), the Anthropocene imposes new demands for capabilities to deal with complexity and uncertainty. Framing choices and structural determinants combine to create governance deficits in governing complex social-biophysical systems. The MDB is precisely such a system. It spans more than one million square kilometres, encompasses twenty jurisdictional areas, involves more than 2.4 million people, supports over $24 billion in agricultural production annually, and is subject to accelerating climate variability. No set of rules, targets or diversion limits — however well-designed — can substitute for the ongoing, adaptive, feedback-rich process of governing such a system.

Governing is the process of steering an ongoing, viable course in response to feedback (Ison and Straw, 2020, *The Hidden Power of Systems Thinking*; Pollard et al., 2023). This is fundamentally different from — and more demanding than — setting targets and measuring progress towards them. The Basin Plan's dominant metaphors, as mapped in Ison, Allan and Collins (2015, *Environment & Planning C* 33: 1697–1713), are those of ‘commanding and controlling’, ‘doing business’ and ‘ecosystem monitoring’. These metaphors reveal a plan primarily framed as a linear instrument aimed at predetermined endpoints rather than an adaptive, socially-embedded governing system capable of navigating surprise. The 2026 Review is an opportunity to change this foundational framing.

### Recommendation 1

The 2026 Review should explicitly name governance and governing as a cross-cutting theme — not a subset of ‘regulatory design’. The Review's final report should distinguish between structural governance reforms (rules, institutions, legislation) and the properties and processes of governing (adaptive capacity i.e., feedback richness, social learning, institutional reflexivity). It should also distinguish between systematic approaches to governance (rule-setting, target measurement,

compliance regimes) and the systemic capabilities[1] needed to govern a complex, dynamic, social-biophysical system. Both matter; only the former has been consistently prioritised since 2007.

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## 2. The Rewriting Must Break Path Dependencies

The Discussion Paper acknowledges that the Basin Plan has delivered real benefits and that more is needed. This is accurate and appropriately modest. What it does not adequately address is why, after more than a decade of reform, 'more' has proven so difficult to achieve. The answer, in significant part, lies in what systems scholars call path dependency: the self-reinforcing institutional, technological and cognitive lock-in that makes systems resistant to change even when the need for change is clear.

Research on the Goulburn-Broken Catchment — a key MDB sub-catchment — illustrates this vividly. Wallis, Ison and Samson (2013, *Land Use Policy* 31: 412–421) used critical systems heuristics to identify key differences between what the water managing system 'is' and what stakeholders said it 'ought' to be: decision-making power was concentrated in political and central bureaucratic arenas rather than in communities and independent bodies; technical and engineering expertise was privileged over contextual, local knowledge; and Catchment Management Authorities were chronically under-resourced and treated as conduits for government funding rather than as capable governing entities. The systematic logic of centralised targets and technocratic expertise kept reasserting itself even as the rhetoric shifted toward adaptive management.

The Northern Victoria Irrigation Renewal Project, examined in Wallis, Iaquinto, Ison and Wrigley (2015, *International Journal of Water Governance* 4: 19–36), provides a cautionary case of what happens when large-scale public investment proceeds without adequate stakeholder platforms, appropriate facilitation, or genuine community involvement. The scheme was framed primarily as a technical engineering issue — a systematic problem demanding a systematic solution. Community meetings were 'informing' events rather than deliberative ones. Farmers were dealt with individually rather than collectively, preventing the emergence of cooperative solutions. The result was significant social distress, stranded assets, and contradictions between simultaneously operating policies (irrigation renewal and water buyback) that worked against each other. The governance of this investment exemplified what the APSC (2007) called 'wicked problem' management failure: a failure to engage systemically with an irreducibly complex, value-laden situation.

These are not historical curiosities. The same structural patterns — centralised authority, technocratic framing, inadequate community platforms, under-resourced regional bodies — are identifiable in the current period of Basin reform and are directly relevant to the prospects of success for the rewritten Plan.

### Recommendation 2

The rewritten Basin Plan must include explicit provisions for systemic governing at the regional and catchment scale, not only at the Basin-wide Commonwealth level. Catchment Management Authorities and their equivalents must be adequately resourced, empowered to exercise genuine adaptive management, and enabled to be sites of social learning — not merely delivery agents for externally determined targets.

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[1] Understandings from systems thinking in practice (STiP), complexity sciences and cybernetics are, unfortunately, largely missing from Australia's environmental governance discourse and practices i.e., the lack of systemic sensibilities and systems literacies undermine STiP capabilities being employed in governing.

### Recommendation 3

The Review should commission a systemic inquiry (see Allan et al 2019) into institutional path dependencies in MDB governance — which institutional arrangements, technological lock-ins, and cognitive framings are preventing adaptive responses — and make recommendations for how these can be deliberately disrupted. Critical systems heuristics, as applied in Wallis, Ison and Sampson (2013), provide one such methodology for surfacing the 'is' versus the 'ought' across stakeholder groups.

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## 3. Social Learning Must Be Institutionalised, Not Just Mentioned

The Discussion Paper's treatment of 'improving science and knowledge' is welcome, but it conflates two distinct activities: the production of knowledge and the use of knowledge in governing. Research over more than two decades — including foundational work in Ison, Röling and Watson (2007, *Environmental Science & Policy* 10: 499–511) and Ison, Collins and Wallis (2014, *Environmental Science & Policy* 53: 105–117) — demonstrates that in complex, contested, value-laden situations like MDB water management, the 'loading dock' model of science — where knowledge is produced separately and then transferred into policy — consistently fails. What is required instead is social learning: a process of concerted action among multiple stakeholders arising from changes in understanding, practices and social relationships, enabled by appropriate institutional settings. Systems thinking in practice capabilities do not just appear; they are cultivated and 'housed'.

Social learning is not simply consultation or stakeholder engagement (though both matter). It is a governance mechanism — a way of co-producing legitimate, adaptive, contextually-grounded decisions in the face of uncertainty and complexity. Critically, it requires systemic, not merely systematic, design: it cannot be 'delivered' through a structured process with predetermined outputs; it must be cultivated through institutions that are genuinely open to feedback, capable of learning, and structurally positioned to act on what they learn.

Rubenstein, Wallis, Ison and Godden (2016, Water Alternatives 9(1): 33–55) documented the Water Governance Research Initiative — an attempt to build a national community of conversation among water governance researchers and practitioners in Australia — and found that, despite building genuine cross-disciplinary connections and producing new governance narratives, its impacts were sharply limited by short-term funding, the closure of the National Water Commission, and the absence of any institutional mechanism to sustain the conversation. The lesson is not that communities of conversation are ineffective; it is that they require dedicated, ongoing institutional homes. Their collapse when defunded exemplifies the systematic versus systemic distinction: the network was built through systematic project management but without the systemic institutional embedding required for persistence.

The South African experience examined in Pollard, Riddell, du Toit, Retief and Ison (2023, *Ecology & Society* 28(1): 47) provides compelling international comparative evidence. In the Crocodile River Catchment, adaptive water governance emerged and proved resilient through the deliberate institutionalisation of multi-scale feedbacks for learning, the establishment of a Catchment Management Agency with genuine delegated authority, and the cultivation of trust, champions and watchdogs. In the Olifants Catchment, where the proto-CMA was placed on hold by a ministerial decision to centralise governance, these arrangements collapsed. The contrast is instructive: it was not the presence or absence of good science that distinguished the two cases, but the presence or absence of systemic governing arrangements.

### Recommendation 4

The rewritten Basin Plan should include an explicit, funded mechanism for institutionalising social learning across the Basin — distinct from, but complementary to, existing scientific monitoring and evaluation frameworks. This mechanism should support ongoing multi-stakeholder deliberation at Basin-wide, regional and catchment scales; enable feedback between on-ground experience and policy adjustment; and provide an institutional home that can persist across electoral cycles and funding fluctuations.

### Recommendation 5

'Science and knowledge' in the rewritten Plan must encompass not only biophysical data, modelling and monitoring, but also governance knowledge: knowledge about how decisions are made, whose perspectives count, how institutions are working and failing, and what conditions enable or constrain adaptive responses. The MDBA should invest in transdisciplinary research capacity that bridges the natural sciences, social sciences, law, Indigenous knowledge systems, and governance — and should explicitly fund sustained science-policy interfaces of the kind Australia briefly had through the National Water Commission before its closure in 2014.

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## 4. Community Participation and Legitimacy Require Structural Reform

Godden and Ison (2019, *Australasian Journal of Water Resources* 23(1): 45–57) examined the legitimacy of community participation in environmental water governance. Their analysis revealed that participation in MDB governance has frequently been structured in ways that satisfy procedural requirements without generating substantive legitimacy — that is, without altering the distribution of authority or the quality of decisions. A majority of WGRI participants surveyed by Rubenstein et al. (2016) rated current stakeholder engagement in water policy-making as done ‘not well’ or only ‘moderately well’. This reflects a systematic approach to consultation — scheduled events, response periods, thematic aggregation — without the systemic conditions (trust, genuine deliberation, shared purpose, feedback to participants) needed for legitimate co-governance.

Governing the Basin is not merely a technical administrative task; it is a performance enacted through interactions of actors, symbols and frames, embedded in histories of dispossession, contested values and competing interests. The dramaturgy of MDB governing — examined in Ison, Rubenstein, Shelton and Wallis (2023, Australasian Journal of Water Resources 27: 346–359) — reveals the symbolic and performative dimensions of Basin Plan policy processes that are usually unrecognised. The ‘script’ written by the Water Act 2007 produced one of the most controversial policy performances in Australian water history. The 2026 Review is an opportunity to write a better script — one that is explicit about the dramaturgy it is creating, more inclusive in its casting, and more alert to the unintended consequences of its staging.

First Nations peoples and communities have a particular stake in this. Cultural flows, Indigenous water rights, and the recognition of Traditional Owners as river custodians rather than merely stakeholders are not add-ons to Basin governance — they are fundamental to its legitimacy and long-term viability. The Water Act's framing of the Basin as a resource to be managed primarily for productive and environmental ends, with cultural and spiritual values treated as secondary considerations, must be addressed in the rewriting.

### Recommendation 6

The rewritten Plan must move beyond consultation as notification. Co-design processes — where communities, First Nations peoples, irrigators, environmental water holders and local governments are genuine partners in working out the problems to be addressed as well as the solutions — should be embedded in both the Plan's development and its ongoing implementation.

### Recommendation 7

First Nations water rights, cultural flows, and the governance role of Traditional Owners and Custodians must be addressed as foundational governance matters in the rewritten Plan, not as add-ons to an otherwise unchanged framework. The MDBA should work with First Nations representatives to co-design governance arrangements that recognise their standing as water custodians, not merely as stakeholder groups to be consulted.

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## 5. Climate Change Demands Systemic, Not Merely Systematic, Adaptation

The Discussion Paper is appropriately serious about climate change, noting that the Basin must change to adapt to what is projected to be a significantly drier and more variable future. Reduced inflows, more frequent extreme events, and non-stationarity in hydrological conditions render the core assumptions of the original 2012 Plan increasingly unreliable. This is not a problem that can be addressed by revising sustainable diversion limits alone, however important that revision is.

'Stationarity is dead' (Milly et al., 2008) — a conclusion that has profound implications for the entire architecture of Basin governance. Rules, entitlements and planning frameworks built on historical averages and assumed stationarity (i.e., stability and predictability) become progressively less fit for purpose as climate dynamics shift. What is required is a governance architecture capable of detecting and responding to changing conditions: a systemic, feedback-rich arrangement rather than a fixed regulatory structure updated every decade.

Ison and Wei (2017, *Science China Earth Sciences* 60: 2225–2227) proposed watershed systems science as a new paradigm for understanding and governing the impact of human activities on the earth's surface in the Anthropocene. They argued that the conventional 'watershed science' paradigm — which treats biophysical and social components as analytically separate and applies systematic methods to each — is insufficient for governing co-evolved social-biophysical systems under conditions of rapid change. What is needed is an explicitly systemic paradigm: one that treats the watershed as an integrated, dynamic, co-evolving system of interacting human and biophysical processes, and that designs governance accordingly. The MDB, as Australia's most complex and pressured river system, is precisely where such a paradigm shift is most urgently needed.

The Anthropocene imposes new challenges for governments that demand capabilities for dealing with complexity and uncertainty (Ison, Alexandra and Wallis, 2018). Current MDB governance, built primarily around compliance, enforcement, and target-setting, is not structured to meet this challenge. As shown by the South African adaptive governance research (Pollard et al., 2023), what distinguishes genuinely adaptive systems is not the presence of 'adaptive management' language in plans, but the institutionalisation of feedback mechanisms, the cultivation of meta-governance[2] arrangements that support experimentation and learning, and the development of trust and relational capital across stakeholder networks. Ison and Straw (2020, *The Hidden Power of Systems Thinking*, Routledge) set out twenty-six principles for systemic governance that are directly applicable to the Basin context. Among the most critical: governance systems must be designed to detect and respond to feedback; purposes must be kept under continuous review; and the biosphere — not economic or social interests in isolation — must be placed at the centre of governance frameworks.

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[2] Meta-governance as a concept draws on systems concepts of system, sub-system and supra-system that exist in a systemic (not systematic) relationship. Thus, at meta levels emergence (and surprise) from a set of sub-systems can be detected and acted upon in a timely manner based on feedback dynamics (not command and control actions)

### Recommendation 8

The rewritten Plan must include explicit, adequately resourced mechanisms for detecting and responding to climate-driven changes in the Basin's hydrology and ecology — mechanisms that go beyond periodic statutory reviews. An ongoing adaptive governance body — with delegated authority to make real-time adjustments within agreed boundaries, guided by both scientific monitoring and community experience — should be established as a structural feature of the new Plan. This body must be designed on systemic, not merely systematic, principles.

### Recommendation 9

The MDBA should commission an independent assessment of the fitness of current MDB governance arrangements for the Anthropocene context — assessing not just whether individual institutions are performing their mandated functions (a systematic question), but whether the overall system of governance is capable of steering a viable course under conditions of increasing uncertainty, non-stationarity and surprise (a systemic question).

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## 6. The Regulatory Design Must Reflect System Complexity

The Discussion Paper discusses regulatory design primarily in terms of compliance mechanisms, enforcement tools, and the structure of water resource plans. While all of these matter, the framing of 'regulatory design' as a question of rules and their enforcement reflects an understanding of the Basin as a system to be controlled, rather than a complex social-biophysical system to be governed. The distinction matters practically: systematic regulatory design produces rules that can be specified in advance and checked against. Systemic governing design produces institutions and processes capable of responding to what cannot be specified in advance.

Bouckaert, Wei, Pittock, Vasconcelos and Ison (2022, *Ambio* DOI 10.1007/s13280-021-01699-4) compared river basin governance across Australia, Brazil, China and France, developing a diagnostic framework that integrates four social-institutional indicators (Leadership, Collaboration, Learning, River Flows governance) with four biophysical indicators (Biodiversity, Species Reproduction, River Flows, Water Quality). Applied to the MDB, actor groups — including government, scientists and irrigators — showed the largest divergence in scores of any basin studied, particularly on Leadership and Learning. This divergence is itself a systemic signal: where actors hold fundamentally different views of the current state and desired direction of governance, the systematic approaches of rule-setting and target measurement cannot resolve the underlying disagreements. Systemic processes of deliberation, shared inquiry and collaborative visioning – a new set of practices, or 'doings', are required.

The 2021 application of this diagnostic framework specifically to the MDB (Bouckaert et al., Environmental Science & Policy 120: 101453) confirmed that the lowest-scoring indicators were Biodiversity and Collaboration — that is, both the core environmental outcome the Plan is designed to protect, and the social governance process most essential to achieving it, were rated as poorly performing. This is not a coincidence. Without systemic collaborative governing processes, environmental outcomes cannot be reliably achieved or sustained, because the feedback loops connecting social decisions to ecological outcomes are not adequately maintained.

Armitage et al. (2015, *Ambio* 44(5): 353–366) — a study of science-policy processes for transboundary water governance including the MDB — identified persistent disconnects between the scientific evidence base and governance processes, noting that these disconnects are structural, not merely communicative. They cannot be resolved by better knowledge translation alone; they require governance arrangements specifically designed to create and maintain productive science-policy

interfaces. The relationship between the Commonwealth and state governments remains a fundamental structural challenge. Wallis and Ison (2011, Water Resources Management 25: 4081–4097) documented how institutional complexity in the MDB creates path dependencies and inertia (both Commonwealth and States) that undermine even well-intentioned reforms.

### Recommendation 10

The regulatory design chapter of the rewritten Plan should be reconceived as a chapter on governing system design — addressing not just rules and compliance, but the institutional arrangements, knowledge systems, deliberative processes and adaptive mechanisms needed to govern a complex social-biophysical system systemically. This requires drawing on systems thinking, complexity science and governance research, not only legal and administrative expertise.

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## 7. On the Use of This Submission

I note that submissions to the Basin Plan Review may be processed using generative AI in a closed system for thematic grouping and summary preparation (MDBA Submission Guidelines, 2026). I support transparency about this use and offer the following observation relevant to how this submission should be categorised and used.

This submission's primary focus is governance and governing — specifically, the need to move from a plan conceived primarily as a regulatory instrument to one conceived as a systemic governing framework. It is directly relevant to the Discussion Paper's chapter on regulatory design, and to the cross-cutting themes of science and knowledge, community participation, and climate change adaptation. It draws on a sustained, peer-reviewed research programme specifically focused on the MDB and on comparative international river basin governance. The recommendations are evidence-based, specific, and actionable.

I would encourage the MDBA, in synthesising submissions, to resist the tendency to aggregate governance concerns into a single 'process' category that is then weighed against the more 'substantive' concerns of water allocation, environmental flows, and infrastructure. As this submission argues — and as the research literature consistently demonstrates — the quality of governing is not a process matter separate from substantive outcomes; it is the primary determinant of whether any substantive outcome can be reliably achieved and sustained over time. The distinction between systemic and systematic approaches is not a nuance of academic interest; it is the difference between governance that can adapt and govern and governance that can only measure and enforce.

I am willing to meet with MDBA staff, the review team, or the Commonwealth Minister for the Environment and Water to discuss the arguments and recommendations in this submission in more detail. I can also facilitate workshops or inquiry processes drawing on the methodological approaches described in my research.

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## Summary of Recommendations

- Recommendation 1: Name governance and governing as an explicit cross-cutting theme; distinguish structural governance from the quality of governing; and distinguish systematic from systemic approaches to both.
- Recommendation 2: Empower and adequately resource regional catchment governance bodies as systemic governing institutions, not merely delivery agents.

- Recommendation 3: Commission a systematic inquiry into institutional path dependencies preventing adaptive responses across the Basin.
- Recommendation 4: Institutionalise social learning as a funded, ongoing governance mechanism with a permanent institutional home.
- Recommendation 5: Broaden the science and knowledge framework to encompass transdisciplinary governance knowledge and sustained science-policy interfaces.
- Recommendation 6: Move beyond consultation-as-notification to genuine co-design of Basin governance and planning with communities and First Nations peoples.
- Recommendation 7: Address First Nations water rights and governance roles as foundational — not supplementary — in the rewritten Plan.
- Recommendation 8: Establish an ongoing adaptive governance body with systemic design principles and authority to respond to climate-driven changes between statutory review cycles.
- Recommendation 9: Commission an independent assessment of the fitness of current MDB governance for Anthropocene conditions, distinguishing systematic performance from systemic governing capability.
- Recommendation 10: Reconceive regulatory design as systemic governing system design, drawing on systems thinking and complexity science.

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## References and Supporting Research

### Peer-reviewed publications (selected)


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*— End of Submission —*