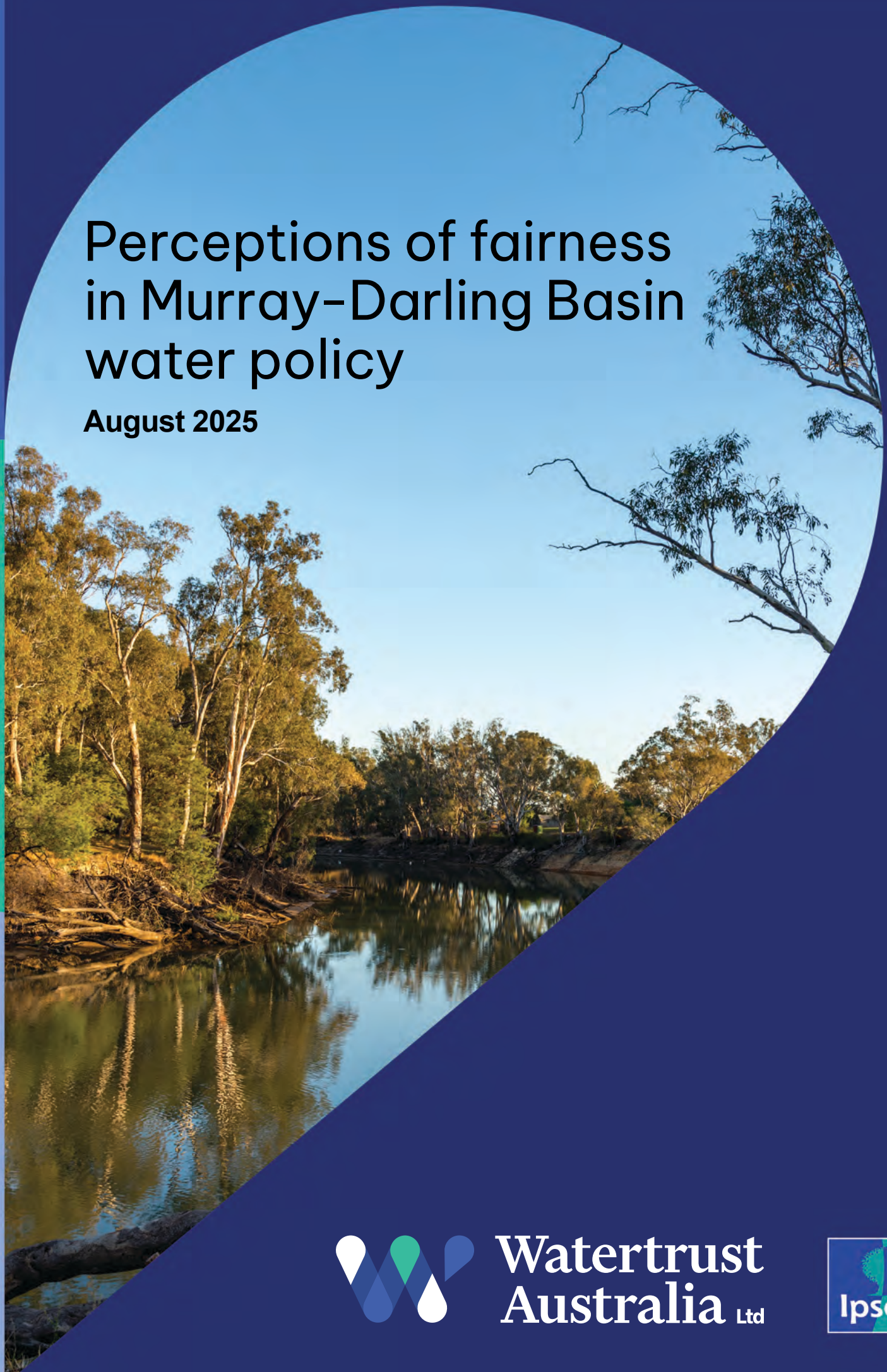
Perceptions of fairness in Murray-Darling Basin water policy

August 2025



Watertrust Australia Ltd

Ipsos

Citation, authorship and acknowledgements

Citation

Rod Marsh, Daniel Pole, Erika Graetz, Jennifer Brook and Shagnik Lahiri, *Perceptions of fairness in Murray-Darling Basin water policy*, Watertrust Australia, Canberra, 2025.

Authorship

Each listed author made a significant intellectual contribution to the work, as follows: Rod Marsh[1], conception and design, contribution of knowledge, survey design, data analysis and interpretation, report drafting, report review; Daniel Pole[2], survey design, data collection, report review; Erika Graetz[2], survey design, factorial survey data analysis; Shagnik Lahiri[2], survey design, data collection, report review; Jennifer Brook[2], survey design, data collection, report review.

Author affiliation: [1]marsh.eco, [2]Ipsos Australia

Acknowledgements

We would like to acknowledge and thank the following contributions without which this work would not have been possible. All our varied respondents from across the Basin jurisdictions, who took the time to complete the survey. Amanda Wealands of Alluvium provided project management. Finlay Watson and Sophie Eickelman wrangled citation data with Publish or Perish to find researchers for our expert boost sample. Professor Jacki Schirmer and the team at the Regional Wellbeing Survey at the University of Canberra provided access to Regional Wellbeing Survey panel members contributing to our regional boost sample. The Peter Cullen Trust reached out to Fellows and Friends for our expert boost sample. Dr Geoff Syme provided insightful review and comment on the survey design, the factorial survey experiment, the analysis and the report. Dr Steve Hatfield Dodds provided insightful advice on survey design. Professor Simon Niemeyer provided insightful review and comment, Professor Rhondda Jones provided insightful review and comment on the analytical approach, R code and final report. Professor Helene Marsh provided insightful review and comment on the final report. The authors used AI tools to assist with R coding and manuscript refinement. Of course, all remaining errors are our own.

Watertrust Australia is generously funded by The Ian Potter Foundation, The Myer Foundation, Colonial Foundation, The Margaret Reid "Kingston" Bequest, The Besen Family Foundation, The Wright Burt Foundation, The Ross Trust, The William Buckland Foundation, The Yulgilbar Foundation, The Lord Mayo'rs Charitable Foundation, The Quercus Foundation, The Letcome Foundation, pixel seed, and The Doc Ross Foundation.

Licence

Table of contents

Table of contents

Figures & Tables

Executive Summary

Fairness is foundational to effective policy, underpinning public trust, legitimacy, and compliance in democratic governance—especially in contested domains like water policy. Through a large-scale, representative survey of over 3,400 residents of the Murray-Darling Basin's jurisdictions,* including under-represented groups, we mapped fairness perspectives using innovative choice experiments and values assessments. Our research design balanced statistical rigour with pragmatic sampling considerations to support reliable generalisation of findings to the broader population. The effect sizes observed indicate substantive relationships within respondents' attitudes, providing robust support for our findings.

*Queensland, New South Wales, Australian Capital Territory, Victoria and South Australia. Respondents in our representative general population sample were resident inside and outside the Murray-Darling Basin itself. Further detail on our boost samples for under-represented groups can be found in the next section.

Key themes

- **Fairness is contested moral terrain:** Residents of Basin jurisdictions hold widely varying interpretations of fairness in water policy. These differences are rooted in conflicting values, identities, and worldviews. Perceptions of fairness strongly reflect values such as environmental stewardship, First Nations recognition, and local autonomy. These value orientations intertwine with political identities, often overshadowing demographic factors such as age or income.
- **Perceptions of fairness in water allocation choices are associated with worldview divides:** Water allocation choices expose differences between deep environmental concern with demands for urgent action and scepticism toward crisis narratives and top-down government intervention.
- **General support for First Nations' recognition does not always translate into support for water allocations to First Nations:** Support for the fairness of First Nations recognition does not often stand the test of choosing between First Nations and environmental water allocations, underscoring clashes between abstract ideals and pragmatic choices.
- **Policy change and reform are preferred over the status quo:** Strong support for policy change over the status quo unites most respondents. However, there are likely very different perspectives on what change means given differences in values, beliefs and worldviews across the samples.
- **Our boosted samples exhibit values diversity**: Respondents from our boosted samples — First Nations, outer regional and remote residents, and Murray-Darling Basin residents — revealed a diversity of fairness judgements associated with a range of different values and beliefs.

- **Experts and researchers' values and fairness judgements diverge from the general population:** Respondents from our expert and researcher boost group show greater homogeneity of values and beliefs than other samples.
- **Media habits and voting preferences are strongly correlated with fairness judgements:** Media habits and voting preferences are both strongly correlated with fairness judgements and values suggesting evidence for selective amplification of values, beliefs and group identities through reinforcement spirals, where media outlets vie to validate their audiences' preferred beliefs, buttressing and deepening polarisation on fairness issues.

Implications for policy makers

Our findings suggest that **fairness is a moral judgement shaped by values, identities and worldviews**.* For water reform to succeed, it must engage — rather than avoid — the diversity of public perspectives on what fairness demands. These views are not merely differences of opinion; they reflect different values and beliefs about the world.

*Take ecological priorities, for example. While some people believe the rivers and wetlands of the Murray-Darling Basin are in an ecological crisis and fairness demands urgent government intervention, others value the environment through a lens of stewardship and intergenerational responsibility that respects landscapes changed for human use and values local autonomy. If those holding either of these perspectives do not feel their values are considered legitimate in policy making, reform will likely look unfair to a large number of key stakeholders risking backlash and resistance.

Policymakers must recognise that **government and policy legitimacy depends on whether people perceive policy processes and decisions as fair.** In contested domains like water policy, disagreement is unavoidable — but broad distrust is not. Fairness does not require consensus, but it does require that people feel their values have been considered and their concerns taken seriously.

Expert knowledge is important for good water policy and linked to the *Water Act 2007* (Cth) requirements for "best available scientific knowledge". However, our analysis found expert views diverged from general community perspectives. **Policies informed predominantly by expert advice may not align with public perceptions of fairness**, potentially increasing resistance or undermining legitimacy. Importantly, experts strongly rejected local autonomy — a priority valued by many in the community. **Policymakers should proactively address this expert-community gap through genuine, inclusive dialogue**, blending robust scientific expertise with meaningful local input to ensure policies are both effective and broadly accepted.

Designing policy that feels **fair enough** across competing perspectives is not easy — but it is essential for durable, trusted governance. **When legitimacy rests on both fair process and negotiated, workable outcomes, policy decisions are more likely to reflect what Australians judge to be reasonable overall, and to be accepted — even by those asked to give something up.** Fair enough policy decisions do not eliminate conflict, but they make compromise possible and policy more likely to endure.

Fairness and the politics of water

Fairness, justice, and equity lie at the heart of democratic life. When governments act, it is often these values — more than technical details — that shape how people respond. Perceptions of fairness are central to public trust and the legitimacy of government decisions. While fairness is a shared concern, what counts as fair varies widely — and those differences matter for how policy is contested, negotiated, and understood. When policies are seen as unfair, public resistance can weaken compliance and erode government authority.

Water policy is no exception. Competing groups—politicians, environmentalists, irrigators, First Nations and regional communities — frequently appeal to fairness, equity, and justice. But they often mean very different things by these terms. These appeals are not just deeply felt — they are also strategic, used to shape narratives and influence outcomes. Yet the language of fairness can obscure more than it reveals, masking real disagreements and deep differences in values and worldviews. While fairness is a shared concern, what counts as fair varies widely — and those differences matter for how policy is contested, negotiated, and understood.

This report presents the findings of a major online survey on how Australians in the Murray-Darling Basin jurisdictions understand fairness in water policy. Ipsos Australia, a global market research company, conducted the survey for Watertrust Australia between 28 February and 26 March 2025. Ipsos and marsh.eco designed the survey and analysed the results presented here.

What we wanted to know

Watertrust's earlier research into how people's values and worldviews shape their ideas of fairness in water policy revealed strong links between fairness perceptions, values and broader beliefs about how the world works. But, beyond key stakeholders and politicians, it could not speak to how Australians more broadly think about fairness in water policy.

This new study tests the earlier research at scale (see Figure 1). We set out to understand how fairness is understood not only for those who live in the Basin, but also those who live in the cities and communities beyond it. That is important because all electorates influence who governs — and how far, and in what direction, governments are willing to go on water reform. We wanted to know how fairness judgements were associated with values, identities and assumptions about how the world works.

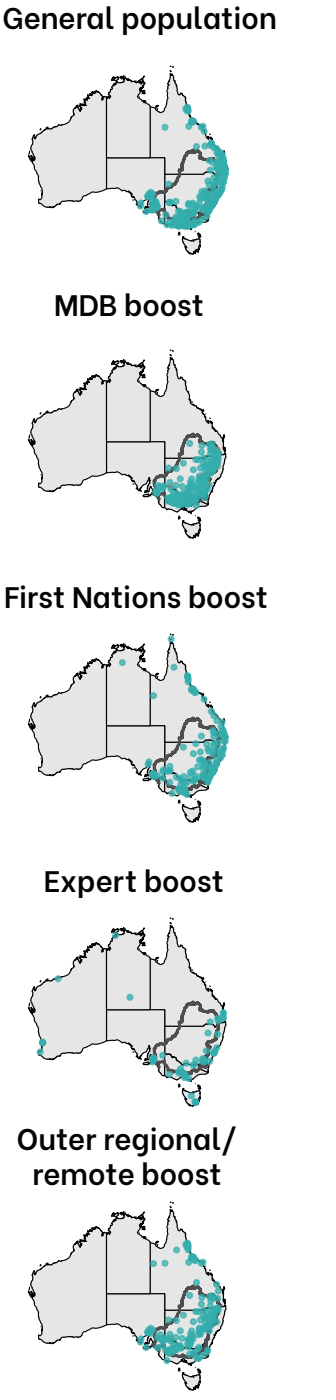


Figure 1: Map of the residential location of survey respondents in our general population sample and boost groups

Each point represents up to 20 respondents. The points are placed at the centroid of participants' residential postcode. This means that some points for the Murray-Darling Basin boost group sit outside the Basin boundary if the centroid of the intersecting postcode is also outside the boundary.

What we did

We drew on a representative sample of the Murray–Darling Basin jurisdictions' population (n = 1,825), resident within and outside the Basin in Queensland, New South Wales, the Australian Capital Territory, Victoria and South Australia. This sample is designed and weighted to ensure that our findings robustly generalise to the views of the broader population of the Basin jurisdictions.

We supplemented our representative general population sample with targeted boost samples for two typically under-represented groups, First Nations (n = 254) and outer regional and remote residents (n = 308).* We included a boost group of Murray-Darling Basin residents (n = 963) to ensure we captured a wider group from the Basin than possible in the general population sample. We also included a boosted sample of Basin-focussed experts and researchers (n = 105) whose views often carry extra weight in policy making because of the requirements of the *Water Act 2007*. We were unable to survey government employees who work on water policy and management. Further research with this group would be an important future step. We analysed the representative general population sample and each boost group separately. We make comparisons between groups using these separate analyses.

* Drawn from Australian Bureau of Statistics outer regional, remote and very remote areas in the Basin jurisdictions. See Figure 23 for a detailed map.

To uncover how people think about fairness, we needed more than opinion polling. People don't always express their values directly — and often aren't fully conscious of the principles driving their judgements. So, we used a factorial survey experiment, a method that presents respondents with policy scenarios and asks them to make choices between competing options. This approach revealed which choices different people considered fair.†

†We provide an overview of the choices in the factorial survey experiment in the next section. A complete list of the factors and factor levels is in the technical summary at the end of this report.

In addition, the survey included a broader set of questions to help understand associations linked with these fairness judgements:

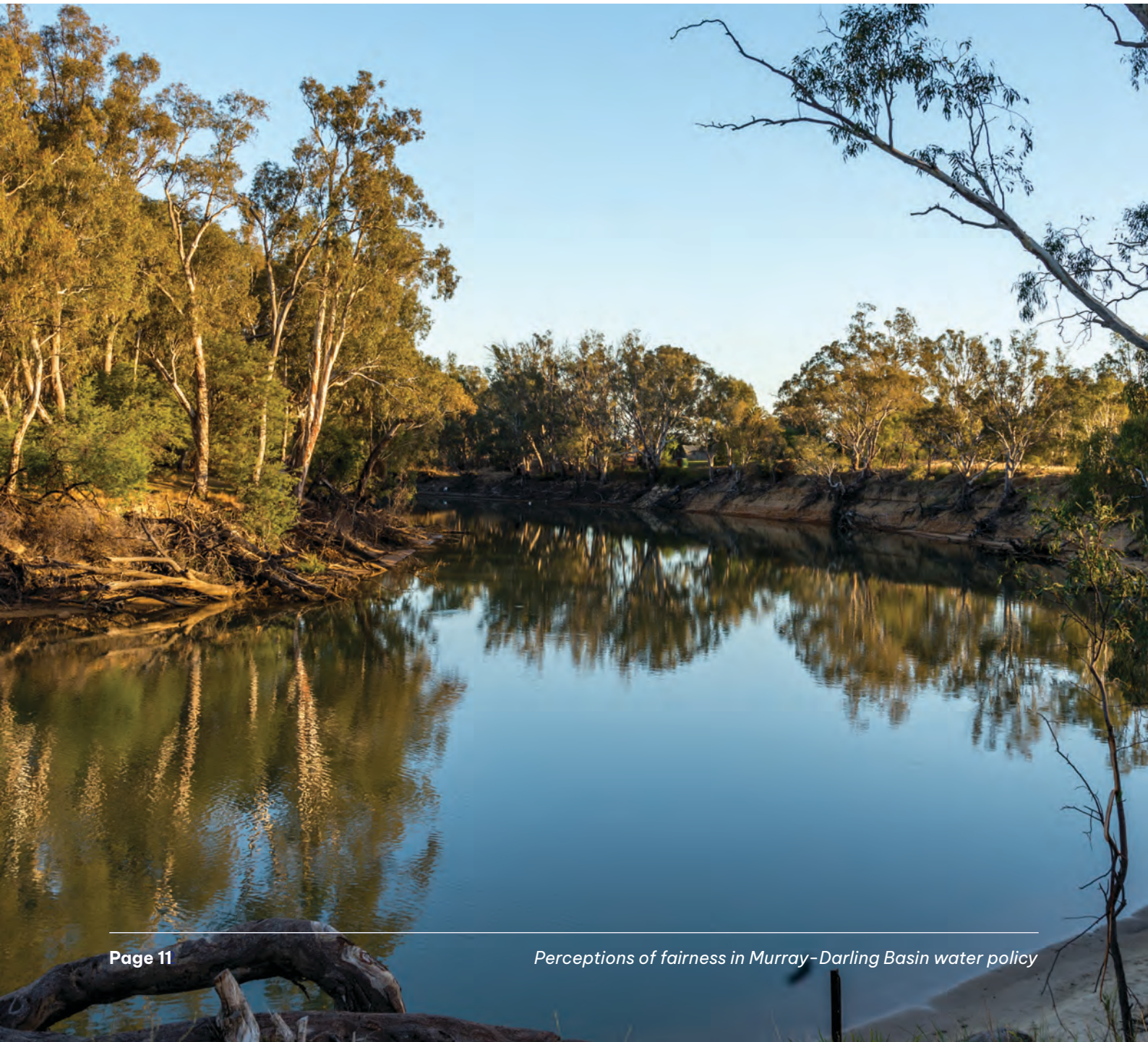
- A|B questions probed choices on ecological urgency, the trustworthiness of science versus local knowledge, and appetites for reform
- Values statements measured on a five-point scale (strongly agree to strongly disagree), which were used to construct five composite values indices to test associations with fairness judgements
- Standard demographic questions on details such as age, sex, education, income, occupation, place of residence, voting intention and media consumption.

These additional components allowed our analysis to associate fairness judgements with broader values, identities, and worldviews. The technical summary at the end of this report provides more detail on our survey design and analytical approach.

What we found

Fairness in Basin water policy is far from a single, shared idea. What one person sees as fair, another may see as unfair — yet each view could reflect a legitimate moral claim.

We found that fairness preferences were closely associated with values and beliefs. These patterns help explain why water policy debates are often so hard to resolve. Competing views on fairness are not simply about facts or interests — they reflect different viewpoints about how the world works and what fairness demands. That means technical fixes alone are rarely enough. To be seen as fair, policy must also speak to people's values.



Representative general population results

Key themes

- **Fairness judgements are strongly associated with values, beliefs, and identities.** For example, whether respondents agree or disagree with values linked to environmental stewardship or First Nations recognition strongly predicts their views about fair water allocation. Similarly, political identities — including voting preference and media consumption — show consistent associations with fairness judgements. These relationships are strong for political science research.
- **Strong associations between values and fairness judgements have significant implications for policy.** Policymakers should recognise the influence of people's values, beliefs, and identities when developing and communicating policies. Equally, policymakers should reflect on and acknowledge their own values, beliefs, and identities, which may differ substantially from those of key stakeholders.
- **Fairness judgements about water allocation and the role of First Nations in policy-making divide the general population along clear values-based lines.** Distinct differences emerge regarding the fairness of prioritising water allocations to agriculture, the environment, or First Nations. Similar tensions arise around whether First Nations should hold differentiated roles or roles equivalent to other stakeholders in policy processes. These differences correlate with values, voting intention and media habits.
- **Preferences about reform and governance show broader agreement but weaker associations.** Most respondents judged continued policy reform as fairer than maintaining the status quo, although these judgements were less closely linked to specific identities or values. Preferences around who should influence water policy decisions were more evenly spread, with only modest links to underlying values or demographic factors.
- **Some demographic factors show meaningful associations with fairness judgements.** While age, income, education and location (urban, regional or remote) are associated with certain fairness judgements, these demographic patterns likely reflect differences in underlying values and identities, rather than directly shaping fairness judgements. Several demographic associations reflect broader shifts documented in recent political economy research across Western democracies.

Making fairness judgements

All survey respondents evaluated the fairness of 12 scenarios that systematically varied policy alternatives across five key dimensions previously identified through stakeholder interviews as central to fairness judgements.* We then assessed both the relative importance respondents assigned to each dimension and how much variation in fairness judgements each dimension explained (see Figure 2).

- **Water allocation** *(environment, agriculture, or First Nations)* had the highest average relative importance (30%) and explained 39% of the variation in fairness judgements. Respondents expressed strong and diverse opinions regarding the fairness of different water allocations.
- **First Nations' roles in policy making** *(special advisory, leadership, or equal stakeholder status)* had an average relative importance of 25%, accounting for 24% of variation. Respondents again showed substantial differences in views about fairness regarding differentiated roles for First Nations.
- **Policy change** *(no change, minor amendments, significant reforms)* had an average relative importance of 19%, explaining 18% of fairness variation. Respondents held mixed views on the fairness of maintaining the status quo or pursuing policy reforms.
- **Whose knowledge matters most in policy decisions** *(experts, local communities, those directly affected, or the general Australian population)* had a relative importance of 16%, explaining 13% of fairness variation.
- **Government leading consultation process** *(Federal, State, or local)* had the lowest relative importance (12%), explaining only 6% of the variance.

Dominant attributes of fairness dimensions

General population respondents' fairness judgements were most strongly associated with water allocation decisions, the role of First Nations in policy making, and the pace and scale of policy changes. These three dimensions explain over 80% of the total variance in fairness judgements and make up nearly three-quarters of the relative importance of the five dimensions for this sample:

1. **Water allocation:** Is it fairer to prioritise water for agriculture, the environment or First Nations?
2. **First Nations involvement:** Is it fairer for First Nations Peoples to have differentiated roles or participate on the same terms as other stakeholders?
3. **Pace of reform:** Is it fairer to keep making big reforms, or incremental improvements, or maintain the status quo?

***Factorial survey experiment**

At the heart of this study is a factorial survey experiment, a method that presents respondents with policy scenarios and asks them to make choices between competing options. This approach allows us to infer the deeper values and priorities that shape their sense of what fairness demands of policy. We identified the five dimensions from Watertrust's extensive analyses of submissions to public inquiries, stakeholder interviews, social media, and Australian media coverage.

By analysing how respondents evaluate these scenarios, we can isolate the influence of each dimension and policy outcome on their judgements and decisions. With a high-quality representative general population sample, we can better understand how people in the Basin states think about fairness in water policy. Our factorial survey approach provides richer insights into underlying values, priorities, and trade-offs compared to traditional survey methods

Here is an example of a scenario vignette:

> *A decision has been made about how water will be shared. The decision prioritises water for agricultural and economic benefit despite any negative environmental impacts. The decision-making process put First Nations People in the same role as any other stakeholder. The federal government ran the consultation process and the knowledge and views of experts and researchers had the greatest influence on the decision. The decision is final and there will be no changes for the foreseeable future.*

The full list of factors and factor levels is shown in the technical summary.

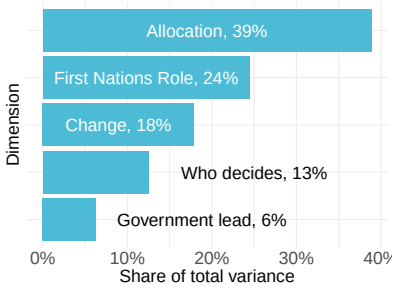


Figure 2: Share of total variance explained.

Beliefs about whose knowledge — local communities, experts, the views of those most affected by a decision, or the views of most Australians — should primarily influence policy decisions also influenced perceptions of fairness.* Fairness judgements around which level of government should lead consultation had little influence, suggesting that the level of government was not a primary concern for most respondents.†

*The relative importance and explanatory power of these five dimensions on fairness judgements is similar in each of our boost group samples.

†We excluded the dimension Government leading consultation processes from further analysis due to its limited explanatory power and low relative importance among the general population. While our more engaged stakeholder groups emphasised this factor in earlier interviews, it emerged as less influential for the broader public. This suggests that although the level of government leading consultations may matter for actively engaged stakeholders, it does not substantially shape general population perceptions of fairness in water policy. Had we been successful in recruiting a policy maker boost sample, this dimension may have had higher explanatory power and relevance for this group.

Water allocation priorities

The factorial survey experiment was designed to clarify how people make trade-offs between competing fairness claims when not all policy goals can be simultaneously met. By explicitly presenting respondents with constrained choices (e.g. "*the decision prioritises water for agricultural and economic benefit despite any negative environmental impacts*"), we moved beyond symbolic or socially desirable preferences toward more real world conditions. Unconstrained surveys often generate inconsistent responses — for example, widespread endorsement of both lower taxes and increased public spending, despite their practical incompatibility.[1-3] Constrained-choice vignettes resolve these tensions, delivering results more relevant to policy makers. Our low-level of "neither fair nor unfair" responses suggests that this approach was effective in eliciting clear preferences.

Figure 3 (p.16) maps these choices for our representative general population sample. Each respondent's views are positioned along two fairness choice dimensions:

- It's fairer to prioritise water for agriculture over water for the environment (horizontal axis)
- It's fairer to prioritise water for First Nations over water for the environment (vertical axis)

The largest group of our representative general population sample (42%) occupies the lower-right quadrant, viewing prioritisation of water for agricultural over the environment, and water for the environment over First Nations, as fairest. This quadrant contains the densest part of the distribution, but these views are not as strongly held as the one-third of respondents (34%) occupying the lower-left quadrant, holding that prioritising environmental water above both agricultural and First Nations claims is fairest. Notably, this group has the largest number of outliers holding the strongest views of any quadrant. Around one-sixth (17%) of the sample is located in the upper-right quadrant, for this group fairness means prioritising First Nations' water over environmental water and water for agriculture over the environment. The stronger views in this quadrant tend towards prioritising water for agriculture over the environment. The smallest proportion (7%) is in the upper-left quadrant, who consider fairness as prioritising water for First Nations over the environment and water for the environment over agriculture.

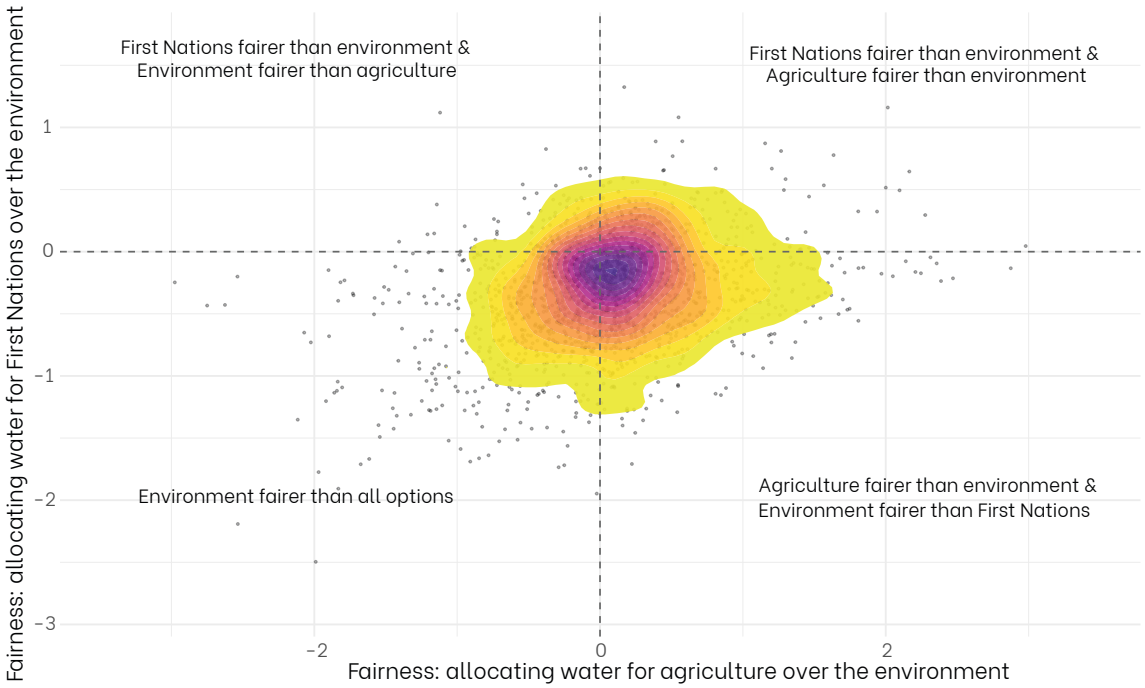


Figure 3: Density plot of representative general population respondents' fairness judgements about water allocation.

Figure 3 notes: The density plot shows the distribution of representative general population respondents' fairness judgements about water allocation trade-offs. Each point represents one respondent. Coloured contours indicate density, with darker areas showing higher densities of respondents' fairness judgements. The largest group of general population respondents (42%) judge it fairer to allocate water to agriculture over the environment and the environment over First Nations. A third (34%) judge it fairer to allocate water to the environment over all other options, this group also has the largest number of strong outlier views. Smaller groups judge it fairer to allocate water to First Nations over the environment and agriculture over the environment (17%) or First Nations over environment, and the environment over agriculture (7%).

Overall, respondents views on whether it is fairer to prioritise water for agriculture or the environment are close to evenly split (43%, 40%), while a substantial majority (73%) believe environmental water should take precedence over First Nations water (Figure 4). This hierarchy suggests agricultural concerns narrowly outweigh or match environmental ones for ordinary residents of the Basin jurisdictions, while First Nations claims remain a lower priority than either in the general population's conception of fairness.

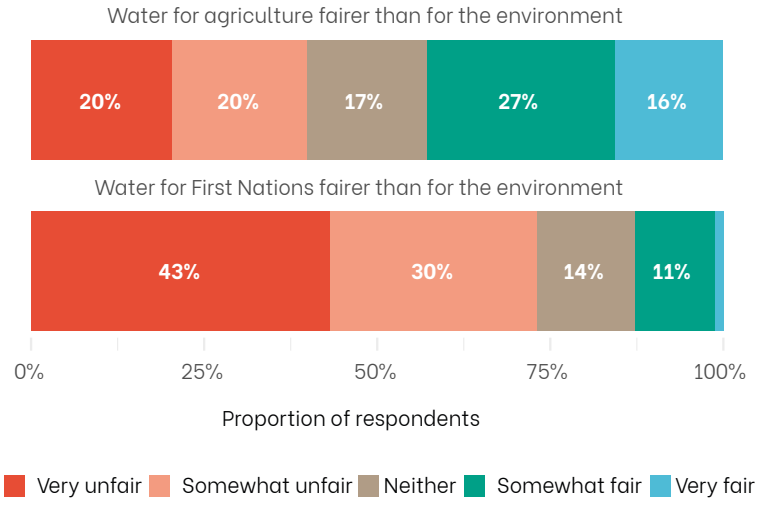


Figure 4: Distribution of respondents' fairness judgements on water allocation decisions.

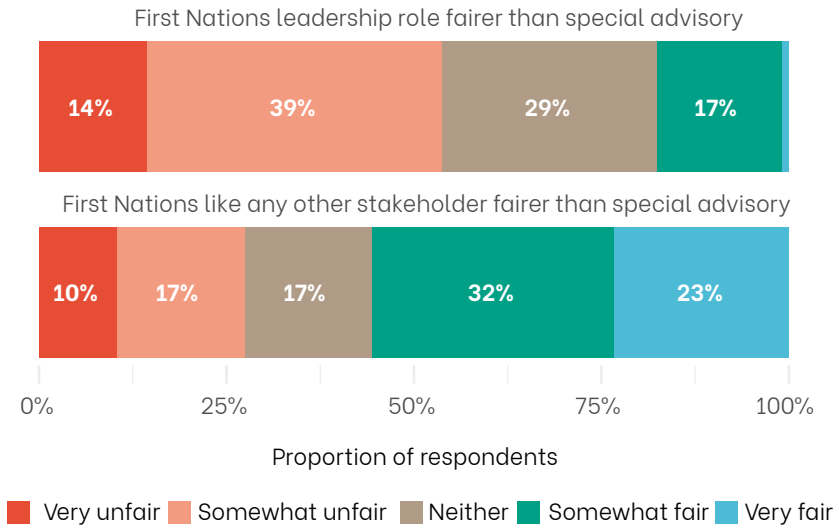


Figure 5: Distribution of respondents' fairness judgements on First Nations' roles.

These results reveal clear disagreement. While the plurality view is that prioritising agriculture over the environment is fairer, a slightly smaller proportion believes the opposite. Similarly, while most respondents think environmental water should take precedence over First Nations water, a little over a tenth (12%) disagree (the remainder are neutral).

First Nations roles in water policy

The factorial survey also explored fairness judgements on the role of First Nations Peoples in water policy decisions (Figure 5). Respondents evaluated whether First Nations Peoples should have the same role as other stakeholders, a special advisory role, or a leadership role. A majority (55%) viewed equal stakeholder status as fairer, with only 27% regarding it as unfair. Conversely, when choosing between a special advisory role and distinct leadership, 53% considered leadership unfair, while just 18% saw it as fair.

In contrast, general perspectives on First Nations rights and recognition — measured by an index covering rights to water, historical exclusion, and Basin Plan outcomes — show broader support (45%) among the general population sample. Yet, as we shall see in the next section this endorsement of general values does not necessarily translate into support for choices to prioritise water allocations or differentiated governance roles for First Nations Peoples.

What is associated with fairness judgements?

Fairness judgements are closely associated with values, identities, and beliefs. This section uses survey-based indices, voting preferences, media consumption, and key belief-based questions to explore how respondents' values and worldviews shape their fairness judgements.

Using responses to a set of statements drawn from established survey instruments, we constructed five indices measuring respondents' values and beliefs regarding environmental risks, stewardship responsibilities, recognition of First Nations, local decision-making, and fairness in policy processes:

- **Fragile nature & ecological crisis index:** Measures agreement with ideas about nature's vulnerability and environmental crises, concerns about human interference causing harm, the limits of nature's resilience and the risk of ecological catastrophes.
- **Nature stewardship index:** Measures agreement that environmental protection is essential for future prosperity, underscoring intergenerational equity and farmers' environmental obligations.
- **First Nations recognition index:** Captures agreement with First Nations Peoples' water rights, their connection to water and land, restorative justice for historical wrongs, and the importance of ensuring fair outcomes for First Nations communities in the Basin Plan's implementation.
- **Local autonomy index:** Measures preferences for local decision-making, valuing community knowledge and control over resource management, and opposition to speculative ownership of water.
- **Fairness process norms index:** Measures commitment to balanced, transparent, and inclusive water policy processes, emphasising equitable outcomes, finding common ground, and recognition of the lack of simple solutions.

These indices provide a structured way to interpret how respondents' values and beliefs align with their fairness judgements.* We were not able to construct a valid and reliable index for agricultural values, suggesting that agriculture-oriented attitudes do not cohere strongly into a unified dimension within the general population sample. Notably, agreement with individual agriculture-oriented statements was more strongly associated with *nature stewardship index* agreement than *fragile nature & ecological crisis index* agreement. Full details on the indices can be found in the technical summary at the end of the report.

* Across all five indices, we standardised values with means near zero, so negative scores reflect disagreement and positive scores reflect agreement. Several indices – particularly those relating to First Nations recognition, stewardship, and fairness process norms – showed skew toward negative values, with long left tails indicating a minority of respondents who strongly rejected these views, despite medians being slightly positive.

How values relate to fairness judgements

Respondents' values show strong associations with their fairness judgements about water allocation decisions favouring either agriculture, First Nations or the environment. Figure 6 shows how values—such as perceptions of ecological risk, responsibility toward the environment, recognition of First Nations, local autonomy, and fairness norms — correlate with specific fairness judgements. These values are relevant because they reflect beliefs about how society should prioritise competing claims and allocate resources.[7]

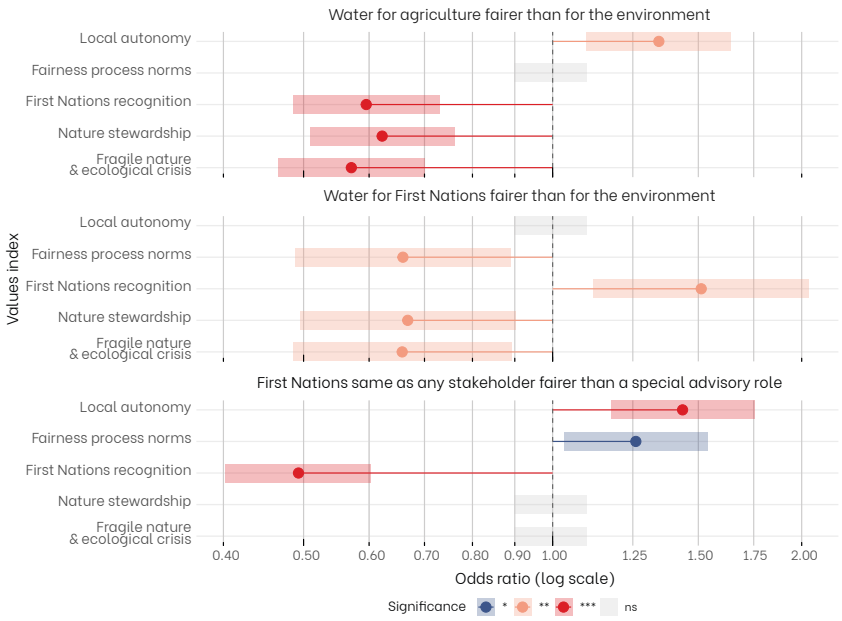


Figure 6: Odds ratios showing significant associations between underlying values (rows) and fairness preferences (panels).

Respondents who endorsed *local autonomy* values had higher odds than others of considering it fair to prioritise agriculture over the environment (OR ≈ 1.3). In contrast, those committed to *ecological crisis*, *nature stewardship* or *First Nations recognition* values had substantially lower odds of considering it fair to prioritise agricultural water allocations over the environment (ORs = 0.57–0.62).

Respondents endorsing *fairness process norms*, *nature stewardship*, or *ecological crisis* values had lower odds (ORs ≈ 0.66) of considering it fair to allocate water to First Nations over the environment compared to those who did not endorse these values. Interestingly, approximately two-thirds of respondents who agree with *fairness process norms* and *nature stewardship* values also value *First Nations recognition* in general terms. However, when faced with a choice, these respondents were more likely to consider it unfair to prioritise First Nations water rights over the environment

Figure 6 notes: The x-axis uses a logarithmic scale for odds ratios. Results not statistically different from an odds ratio of 1, i.e. no difference, are not shown (grey boxes). Points to the right of the vertical dashed line indicate higher odds of agreeing with the fairness judgement, while points to the left indicate lower odds. Colours show significance (*p < 0.05, **p < 0.01, ***p < 0.001), and shaded boxes represent 95% confidence intervals.

Odds ratios (OR) indicate how much more likely respondents agreeing with a given value index are to endorse the fairness judgement shown in each panel, compared to those who do not share that value. For example, respondents agreeing with the fragile nature & ecological crisis index have about 0.57 times (95% CI: 0.46–0.70) the odds of judging water allocations favouring agriculture as fair (top panel), relative to respondents not holding this value. Conversely, this means they have around 1.75 times (the reciprocal of 0.57) the odds of viewing allocations favouring agriculture as unfair. This finding is highly unlikely to be due to chance alone (p < 0.001).

Odds ratios versus probabilities: what's the difference?

Probabilities and odds both measure chances, but in different ways. Probability directly expresses the chance of an event happening—like a 10% (or 0.1) risk of rain. Odds show this chance as a ratio of two outcomes: at 10% probability, odds are 1:9, meaning one chance of rain to nine chances of no rain.

An odds ratio compares the odds between two groups. For instance, an odds ratio of 3 for smokers developing lung cancer means smokers have three times the odds of getting lung cancer compared to non-smokers. Odds ratios show how strongly one factor (smoking) is associated with another (cancer), but they don't prove that one causes the other – other factors may be involved.

(reciprocal OR ≈ 1.5).* In contrast, respondents who prioritise *First Nations recognition* had higher odds (OR ≈ 1.5) of considering it fair to prioritise First Nations water rights over the environment. This divergence highlights a key conflict: general endorsement of First Nations recognition seems to weaken in scenarios where it competes directly with environmental priorities. Additionally, it points to a possible drawback in ecological crisis narratives, which tend to prioritise environmental concerns at the expense of other considerations.

The final panel of Figure 6 (p.19) presents findings on fairness judgements concerning the role of First Nations in water policy making. Respondents committed to *First Nations recognition* had substantially lower odds (OR ≈ 0.4) of viewing equivalent roles for First Nations — as if they were the same as any other stakeholder — as fair, preferring instead a special advisory role. Conversely, respondents prioritising *fairness norms* (OR ≈ 1.3) or *local autonomy* (OR ≈ 1.4) values were more likely to consider it fair that First Nations participate on equal footing with other stakeholders. These differences reflect contrasting interpretations of fairness: one grounded in differentiated rights arising from distinct knowledge systems and addressing historical exclusion from water policy decisions, and the other emphasising fairness as equal treatment.

*In this report, we present only statistically significant odds ratios (ORs), defined as those with a p-value less than 0.05, indicating a less than 5% likelihood that the observed associations are due to chance. Many results, as shown in the charts, are highly significant ($p < 0.001$), providing strong evidence that these associations are not random.

Fairness judgements and beliefs

Respondents' values were closely associated with their beliefs about the ecological health of the Murray–Darling Basin, the role of government, and preferred sources of knowledge. Figure 7 (p.21) shows how agreement with different value indices related to the odds of choosing viewpoints on three key issues. Respondents who agreed with *local autonomy* values had lower odds of believing the Basin faces an urgent ecological crisis (OR = 0.85). In contrast, agreement with *fragile nature & ecological crisis*, *nature stewardship*, and *First Nations recognition* values was associated with substantially higher odds of holding this belief (ORs = 2.0–3.6).

Respondents agreeing with *local autonomy* values also had greater odds of preferring policy stability and limited government over major reform (reciprocal OR ≈ 1.6). Conversely, agreement with *fragile nature & ecological crisis* and *First Nations recognition* values was associated with higher odds of supporting major reform and stronger government involvement (ORs ≈ 1.5). Patterns were also evident in knowledge preferences. Agreement with *local autonomy* values was associated with higher odds of trusting local experience over scientific studies (reciprocal OR ≈ 2.5), while those agreeing with *fragile nature & ecological crisis* showed higher odds of trusting scientific evidence (OR ≈1.7). These patterns are magnified by strong agreement with values indices. For example, those strongly agreeing with *fragile nature & ecological crisis* and *nature stewardship* values had more than five times the odds of believing the Basin to be ecological crisis demanding quick action (ORs = 5.2, 5.8) than those not strongly agreeing with each of these values (at $p < 0.001$).

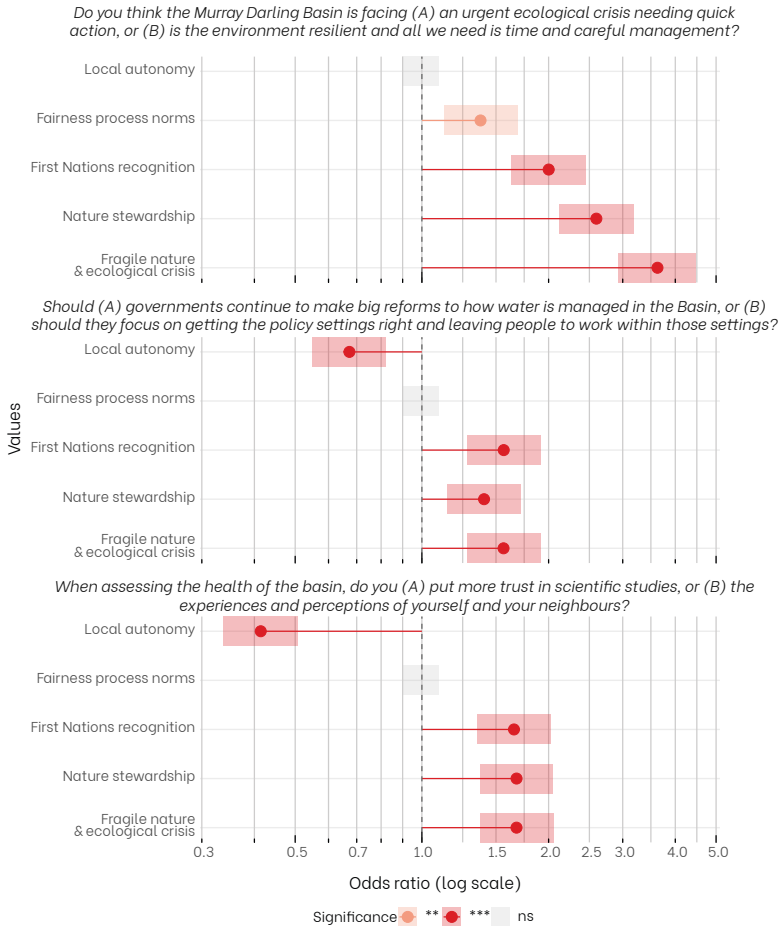


Figure 7: Odds ratios showing significant associations between values (rows) and A|B question responses (panels, choose A).

Figure 7 notes: The x-axis uses a logarithmic scale for odds ratios. Results not statistically different from an odds ratio of 1 are not shown (grey boxes). Points to the right of the vertical dashed line indicate higher odds of agreeing with the fairness judgement, while points to the left indicate lower odds. Colours show significance (*p < 0.05, **p < 0.01, ***p < 0.001), and shaded boxes represent 95% confidence intervals.

Odds ratios compare the odds of choosing option A (over B) between those who agree with a value index and those who do not. For example, respondents who agree with the *fragile nature & ecological crisis* index have 3.6 times the odds (95% CI: 2.9–4.5) of believing that the Murray-Darling Basin is facing an urgent ecological crisis requiring quick action compared to those who do not agree with this value. This finding is highly unlikely to be due to chance alone ($p < 0.001$).

How identities align with fairness judgements – voting preferences and media consumption

Political identities and worldviews can shape perceptions of fairness in policy contexts, such as resource allocation, leading individuals to make fairness judgements associated with group affiliations and ideological worldviews.[8,9] Voting choices tend to serve as expressions of identity and worldview rather than just policy preferences.[10] Media consumption both reflects pre-existing identities and worldviews and reinforces them through selective exposure and spirals of attitude entrenchment.[11] In contested policy domains like water allocation, this dynamic can exacerbate disagreements over fairness when beliefs about what constitutes fair process or outcomes become tied to group membership and identity.[12]

Figure 8 (p.23) shows alignments between respondents' voting preferences and their fairness judgements. Labor and Greens voters had approximately half the odds of seeing agricultural water prioritisation over the environment as fair compared to other respondents (ORs = 0.59, 0.54), while Liberal voters had twice the odds of holding this view (OR = 2.0). Nationals voters were similarly aligned with Liberal voters, though their results did not reach statistical significance. Respondents who did not disclose their voting intention had 1.78 times the odds of regarding water prioritisation for First Nations over environmental needs as fair. Given that nearly all Aboriginal and Torres Strait Islander respondents (98%) disclosed their voting preferences, this pattern likely reflects attitudes among other respondents. It is notable that no other voting intentions provided a statistically significant result on this fairness judgement. Liberal and One Nation (ORs ≈ 1.75) voters were more inclined to regard equivalent stakeholder roles for First Nations as fairer, whereas Greens voters were distinctly less inclined (OR = 0.38) because they felt a special advisory role was fairer. With the exception of fairness judgements about prioritising water for First Nations, these findings suggest consistent alignments between voting choices, a proxy for political identity, and perceptions of fairness in water policy.

Media consumption is both a mirror and a mould for values, group identities and worldviews.[31] People engage in selective exposure (choosing media that aligns with their identity, values and worldviews) and selective avoidance (ignoring dissonant content). At the same time, media sources actively shape and reinforce these group identities and values by repeatedly providing rationalisations for preferred beliefs. This creates a "marketplace of rationalisations," in which media outlets compete to supply the most appealing and convincing justifications for their consumers' preferred, often identity- or worldview-driven beliefs — reinforcing motivated cognition and group loyalties.[13] Within contentious policy debates, this dynamic can deepen partisan divides, solidify group loyalties, and reinforce existing worldviews — making consensus and compromise more challenging.[14]

Figure 9 (p.23) shows how media habits align with fairness judgements. People's views about what's fair in allocating water between agriculture, First Nations, and the environment differ according to their preferred media sources. Those with media habits that include *ABC News* and *Guardian Australia* (GDN) had notably lower odds than others of considering water prioritised for agriculture over the environmental use as fair. Specifically, *ABC* audiences had about one-third lower odds (OR = 0.66), and Guardian readers about half the odds (OR = 0.45), compared to those who do not regularly use these sources. In contrast, audiences of commercial TV news (channels 7, 9, and 10), city tabloids and the website news.com.au (SUN: *Herald Sun, Daily Telegraph, Courier Mail*, news.com.au) had higher odds (OR = 1.26) of believing it fairer to prioritise water for agriculture.

Readers of the city tabloids and news.com.au (SUN) found prioritising water allocations for First Nations over the environment less fair than others (OR = 0.8) and no media audience support for

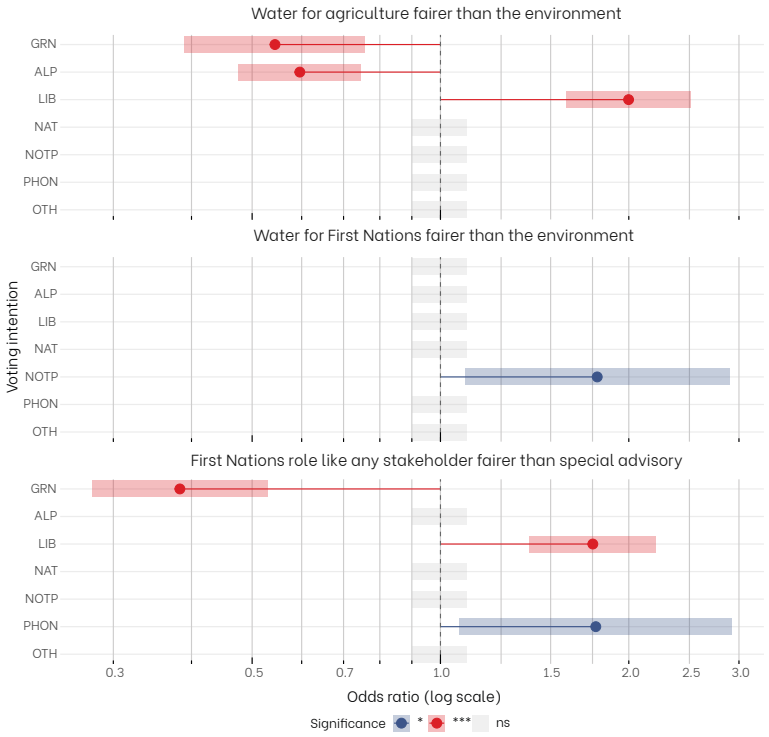


Figure 8: Odds ratios showing significant associations between voting intention (rows) and fairness preferences (panels).

Figure 8 notes: The x-axis uses a logarithmic scale for odds ratios. Results not statistically different from an odds ratio of 1 are not shown (grey boxes). Points to the right of the vertical dashed line indicate higher odds of agreeing with the fairness judgement, while points to the left indicate lower odds. Colours show significance (*p < 0.05, **p < 0.01, ***p < 0.001), and shaded boxes represent 95% confidence intervals.

Odds ratios compare how agreement with fairness judgements relates to respondents' voting intentions. For example, Greens voters had close to half the odds (OR = 0.54) of agreeing that allocating water for agriculture is fairer than water for the environment. In contrast, Liberal voters had twice the odds (OR = 2.0).

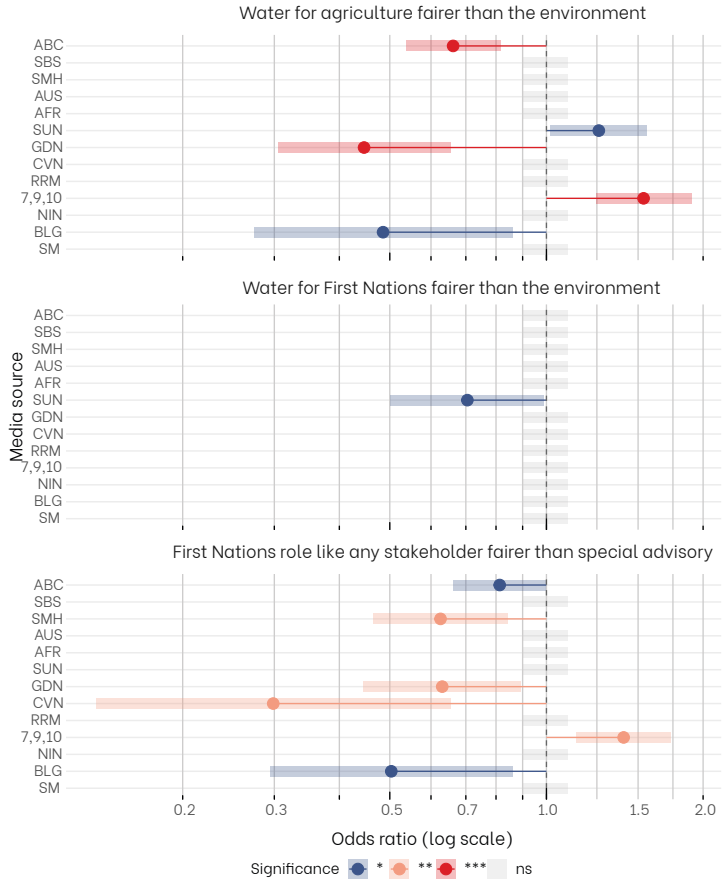


Figure 9: Odds ratios showing significant associations between media habits (rows) and fairness preferences (panels).

Figure 9 notes: The x-axis uses a logarithmic scale for odds ratios. Results not statistically different from an odds ratio of 1 are not shown (grey boxes). Points to the right of the vertical dashed line indicate higher odds of agreeing with the fairness judgement, while points to the left indicate lower odds. Colours show significance (*p < 0.05, **p < 0.01, ***p < 0.001), and shaded boxes represent 95% confidence intervals.

Odds ratios compare agreement with fairness judgements between consumers and non-consumers of each media source. Sources: SMH (Sydney Morning Herald, The Age, Canberra Times), SUN (Daily Telegraph, Courier Mail), GDN (Guardian Australia), CVN (The Conversation), RRM (regional/rural media), 7,9,10 (7,9, 10 news), NIN (Nine News), BLG (blogs), SM (social media).

prioritising First Nations water use over environmental allocations was significant (panel 2, Figure 9, p.23). Attitudes about the fairness of First Nations having the same role as any other stakeholder in policy making instead of in a special advisory role also varied by media habits (panel 3, Figure 9, p.23). Audiences of the *ABC, Guardian* (GDN), *the Age, Sydney Morning Herald, Canberra Times* (SMH), the *Conversation* (CVN) and blogs (BLG) had significantly lower odds than others of considering First Nations having the same role as other stakeholder as fair (ORs ≈ 0.3–0.8). Put another way, readers of the *Conversation* had 3.5 times the odds of considering it unfair for First Nations to have the same role as any other stakeholder. These audiences tend to believe fairness requires differentiated advisory roles for First Nations. Conversely, viewers of commercial TV news (channels 7, 9, and 10) are more likely to see the same policy making role for First Nations as other stakeholder groups (OR = 1.4) as fair.

Values and worldviews are also associated with media habits (see Figure 10). Respondents whose media habits include the *ABC, SBS, Guardian Australia*, and *The Conversation* have significantly higher odds of agreement (ORs ≈ 1.5– 3.4) with the *nature & ecological*

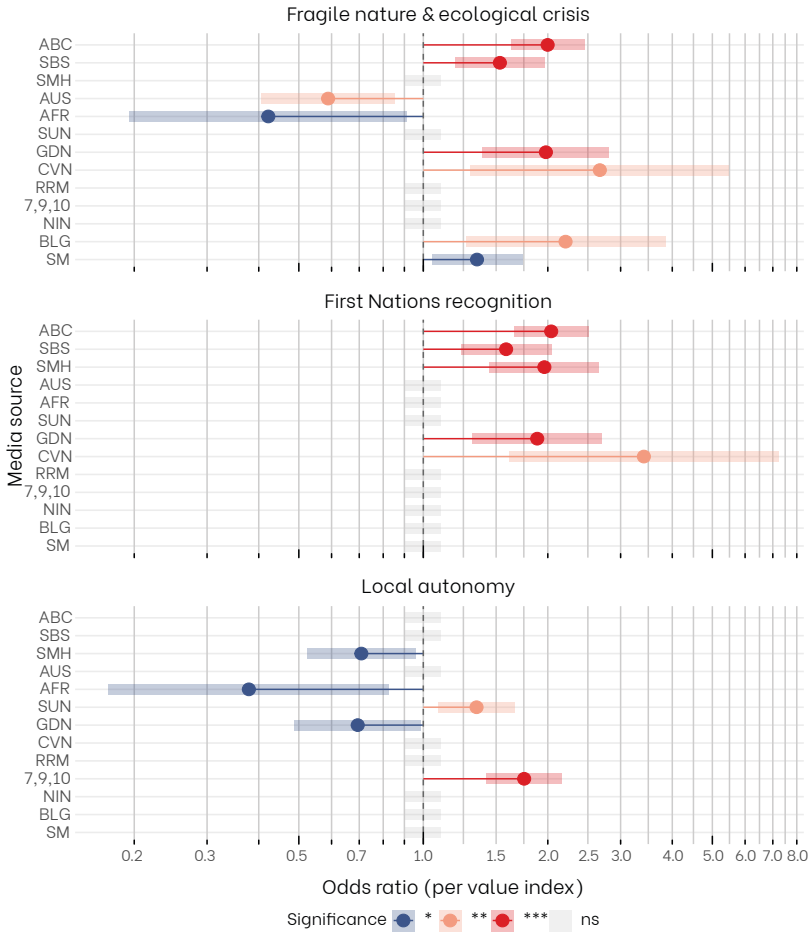


Figure 10: Odds ratios showing significant associations between media consumption (rows) and values indices agreement (panels).

Figure 10 notes: The x-axis uses a logarithmic scale for odds ratios. Results not statistically different from an odds ratio of 1 are not shown (grey boxes). Points to the right of the vertical dashed line indicate higher odds of agreeing with the fairness judgement, while points to the left indicate lower odds. Colours show significance (*p < 0.05, **p < 0.01, ***p < 0.001), and shaded boxes represent 95% confidence intervals.

Odds ratios compare agreement with each value index between audiences and non-audiences of each media source. Sources: SMH (Sydney Morning Herald, The Age, Canberra Times), SUN (Daily Telegraph, Courier Mail), GDN (Guardian Australia), CVN (The Conversation), RRM (regional/rural media), NIN (Nine News), BLG (blogs), SM (social media).

crisis and *First Nations recognition* value indices.[15] The *SMH, the Guardian, the Age, the Canberra Times* and the *Australian Financial Review* also have lower odds of agreeing with *local autonomy* values. Conversely, those with media habits including *The Australian* and the *Australian Financial Review* exhibit reduced odds (OR ≈ 0.4–0.6) of agreeing with the *fragile nature & ecological crisis* value index. *Sun Herald, Daily Telegraph, Courier Mail* (OR = 1.35) and 7, 9 and 10 News audiences are more likely to support local autonomy values (OR = 1.75).

Watertrust's research into framings used by nearly 2000 submissions to 10 inquiries into the Basin Plan found a similar set of narrative frames, with ecological crisis narratives competing with local autonomy and impact narratives to frame public and policymakers' understanding of policy issues and shape the issues agenda.[17] The associations between values and media habits found in this survey suggests selective exposure, reinforcement dynamics, and a marketplace of rationalisations may be at work. Media producers may compete to meet identity-based demands, contributing to polarised fairness judgements and perceptions through selective support for particular narratives and rationalisations.[16] Confirming these associations requires further detailed thematic analysis of media content.

Extent of policy change and who shapes policy

Most respondents judged change in water policy—whether through minor amendments or major reforms—as generally fairer than maintaining the status quo. However, clear associations emerged between certain values, media consumption patterns, and the strength of these fairness judgements. Respondents aligned with environmental and *First Nations recognition* values, as well as *ABC* (OR = 1.36), *The Conversation* (OR = 2.01) and social media (OR = 1.56) audiences had higher odds of believing big reforms were fairer. Voting preferences showed no significant association with fairness judgements about policy change and reform.

Figure 11 (p.26) shows the overall distribution of fairness judgements in the representative general population sample for policy change over no change. Most respondents valued change over the status quo, however, what this change means to respondents varies with their values, worldviews and identities. Given the high proportion of respondents who judged change, minor amendments or big reforms, as fairer than the status quo, the factorial survey experiment dimension on policy change and reform discriminates less well between different values and identities.

Regarding whose influence should shape water policy decisions, associations with fairness judgements were notably weaker. Media associations with fairness judgements on whose views should have the most influence on policy change were limited, although blog

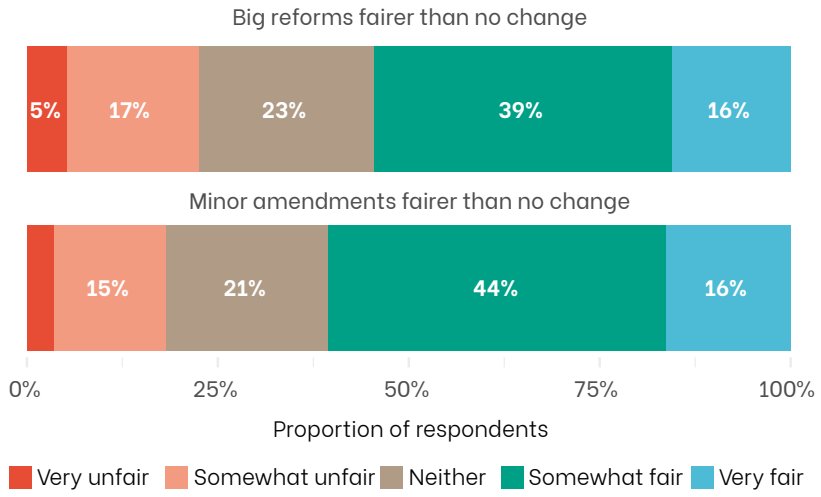


Figure 11: Distribution of respondents' fairness judgements on policy change

readers tended to judge local community influence as fairer (OR = 1.87), whereas SBS audiences leaned toward judging expert influence as fairer (OR = 1.4). Respondents agreeing with *First Nations recognition* had lower odds of judging local community influence as fairer (OR = 0.72) compared to expert authority. Conversely, those committed to f*airness process norms* were more inclined to judge policy influence by local communities and those directly affected as fairer relative to expert-led decisions (OR = 1.23, OR = 1.37).

Figure 12 shows the general population sample divided into thirds on all three options for greatest policy influence — a third seeing it fairer for local communities, a majority of Australians or those most directly affected to have greatest influence (compared to experts), a third seeing this as unfair (preferring expert judgement) and a third expressing no preference.

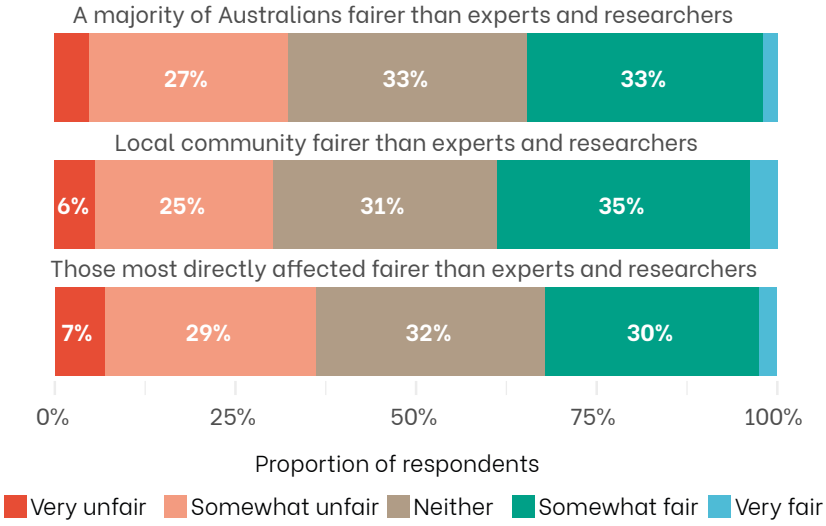


Figure 12: Distribution of respondents' fairness judgements on whose knowledge and views have most influence over policy decisions.

Demographics and fairness judgements

Demographic variables (such as age, income, and education) are less important than identities and values, which explain more variance and better account for changes over time or across contexts.[20] However, demographics also showed associations with respondents' fairness judgements, though with some exceptions these links were weaker than those observed with values. Recent studies in political science suggest values and identities tend to be more proximate and salient drivers of political choices than demographics alone.[18] Demographic variables often correlate with voting patterns but primarily exert influence through mediating factors like identities and values — i.e., they shape *who* holds certain identities or values, but the latter are the direct motivators for political choices.[19]

Nevertheless, we found significant demographic associations with some fairness judgements. Older respondents (aged over 55) had increased odds of believing agricultural water over environmental allocations (OR = 1.6) or First Nations having a role like other stakeholders (OR = 1.8) to be fair. Younger groups (under 25 and 25-54), in contrast, exhibited reduced odds of holding these fairness views (OR = 0.7). Middle-income groups have increased odds (OR = 1.5) of seeing big reforms as fair but reduced odds (OR = 0.7) for believing prioritising water for agriculture over the environment is fair. Those with a university degree had lower odds (OR = 0.74) of considering it fair to prioritise water for agriculture over the environment or for First Nations to have a similar role to other stakeholders in policy processes (OR = 0.69). Basin residents display increased odds for supporting big reforms (OR = 1.6) and local community (OR= 1.5) or majority of Australians (OR = 1.7) influence over policy as fairer than expert-influenced decisions. Major city dwellers were more inclined to believe expert-influenced policy making was fairer than local community leadership (OR = 1.4).

Thomas Piketty, a prominent French economist known for his analysis of inequality and class divisions, has documented the emergence of a "Brahmin left" in Western democracies. His research aligns closely with these patterns observed in our data.* Respondents fitting the Brahmin left profile were significantly more likely to judge water for the environment as fairer than water for agriculture (reciprocal OR = 1.54), water for First Nations as fairer than water for the environment (OR = 1.69), and treating First Nations the same as other stakeholders in policy-making processes as unfair (reciprocal OR = 1.7).

To test if demographic variables like age, income, occupation, or sex unduly influenced results, we added them as controls. Associations held steady, with minimal changes (e.g., <10% shifts in effect sizes) and no flips in significance — e.g., environmental values still strongly predict preferences for prioritising water for the environment over agriculture as fair, even after adjustments. This underscores that values remain strongly associated with fairness judgements.

* Thomas Piketty's concept of the Brahmin left describes a trend in Western democracies where highly educated, urban voters increasingly identify and align with left-wing parties, prioritising cultural, environmental, and social-justice issues over traditional economic or class-based concerns.[32-33]

Effects magnitudes

Effect sizes in political science research

Our observed effects for key associations, such as media habits and voting patterns with values, beliefs, and fairness judgements, range from moderate to large ($r \approx 0.2–0.7$), providing strong evidence of robust links between these elements of the study. Our findings, notably stronger than typical political science effects, are highly generalisable across Murray-Darling Basin jurisdictions due to our large, representative general population sample. The statistical power of our results further ensures their reliability.*

In political science, large meta-analyses of thousands of studies reveal that effect sizes—measuring the practical strength of relationships beyond statistical significance—are typically small.[21] For instance, across diverse topics like voting behaviour and media influence, the median correlation (r) is around 0.14, with most effects falling between 0.10 (small) and 0.30 (medium to large in this field). This means even highly significant findings (e.g., $p < 0.001$) often reflect modest real-world impacts, particularly in large samples—providing context for the stronger associations observed in our study.

Our regressions reveal the strongest effects in how media habits are associated with values, with progressive outlets like The Conversation yielding large effect sizes (r up to 0.69 for nature stewardship, 0.60 for First Nations recognition, and 0.53 for fragile nature and environmental crisis), indicating a strong link between respondents with these media habits and environmental and First Nations-oriented worldviews. Results on the same dimensions for media habits that include the *ABC* and *Guardian Australia* are also strong ($r > 0.40$). In fairness judgements derived from values, we observe moderate effect sizes with strong negative associations emerging for prioritising water for agriculture over the environment and for First Nations having the same role as other stakeholders ($r > 0.2$). Fairness judgements from voting patterns mirror this, showing large effect sizes with the strongest negative associations for Green votes on water for agriculture over the environment and First Nations roles equivalent to other stakeholders ($r > 0.4$), alongside positive associations for Liberal/One Nation votes ($r = 0.30$).

*Power considerations in the analysis

With our large representative general population sample (n=1825), the analysis achieves very high statistical power (≥0.99) for detecting effects in OLS regressions of factorial survey results (e.g., $r \geq 0.15$) and quasibinomial logistic regressions of dichotomised outcomes (e.g., OR ≥ 1.7 at $p < 0.001$, assuming balanced outcomes). Linear approximations of logistic models confirmed these thresholds, ensuring strong confidence in associations between values and fairness judgements.

Key messages for policy makers

- Fairness judgements in water policy are associated with individuals' underlying values, worldviews, and identities. These factors shape perceptions of fairness and influence whether policies are accepted or rejected. Such judgements are likely to remain stable over time.[23] Stability may also be reinforced by motivated reasoning and identity-driven cognition, through which individuals selectively interpret or favour information that aligns with their existing beliefs and identities.[24]
- Media habits likely play a role in reinforcing fairness perceptions by influencing and reinforcing values, worldviews and identities. People likely seek out media sources that reflect their existing values and identities, which in turn reinforce and amplify these views, creating "reinforcement spirals".[25] Policy makers should recognise that individuals are more likely to consume media that aligns with their group identities, with the potential intensifying and entrenching existing fairness divides.
- Principled negotiation should guide policy development. Because values and identities often underpin conflicts over water allocation fairness, approaches that emphasise underlying shared interests (e.g., stewardship of natural resources, community wellbeing) rather than rigid positions are more likely to achieve broadly acceptable outcomes. Explicit negotiation of trade-offs and transparent communication of these choices can mitigate perceptions of unfairness.[26]
- Technical or top-down policy approaches have significant limitations. Appeals to "the science says", "policy requirements", or attempts to merely enhance "water literacy" often fail to address underlying values and identity-driven resistance. Such strategies are unlikely to foster acceptance or a genuine sense that decisions are fair.[27]
- Engagement and deliberation on policy decisions should be inclusive and tailored to diverse audiences. Given the strong variation in fairness views found in this study, co-developing policies with stakeholders and ordinary citizens is more likely to recognise the full range of values, knowledge, and local realities, which can improve policy legitimacy.
- Policy makers should reflect on their own values, beliefs, and identities. While we were not able to include policy makers in our samples, it is unlikely that policy makers' values, identities and worldviews do not influence their own perceptions of fairness. Explicitly acknowledging these influences and reflecting upon them is likely to improve transparency, enhance legitimacy, and facilitate genuine stakeholder engagement and dialogue.

Boost group results

Key themes

Targeted boost groups show distinct fairness preferences. Analysis of boost sample results, including First Nations, regional and remote residents, Murray–Darling Basin (MDB) residents, and researchers and experts, revealed divergences from the general population, offering valuable, but indicative, insights.

- **First Nations respondents** showed stronger support for prioritising environmental water and distinct First Nations leadership roles. However, more than a third considered it fairer to prioritise water for agriculture over the environment and over two-thirds viewed prioritising water for First Nations over environmental needs as unfair or very unfair.
- **Regional and remote residents** were more likely than the general population to judge it both fair, and unfair, to allocate water to agriculture over the environment. This is a result of a smaller proportion of undecided respondents, although the swing towards agriculture was larger. They were also much more likely to judge policy change and the influence of local community viewpoints, or those of the most affected, on policy decisions as fairer than the general population.
- **Murray–Darling Basin residents** showed similar fairness preferences to regional and remote residents but with a stronger emphasis on agricultural allocations and local community influence on policy making. Yhis sample exhibited a clear division in responses between major city and regional residents, which likely reflects the influence of respondents from Canberra.
- **Experts and researchers** prioritised environmental outcomes and First Nations leadership by substantially greater margins than the general population. They were also significantly less likely to consider local community influence in policy making as fair. In both cases, their views significantly diverge from the general public's, highlighting potential challenges in expert-driven policy making's ability to be perceived as fair.

Our findings are not fully generalisable. Unlike the general population sample, boost sample results are best viewed as complementary perspectives, highlighting specific group priorities rather than providing precise, generalisable conclusions. Small sample sizes for some groups also meant some approaches taken with the general population sample would have been under-powered with boost groups with the result that our analysis is more limited in its focus.

Introduction

In addition to our general population results, we gathered insights from targeted boost samples, including First Nations respondents, regional and remote residents, Murray–Darling Basin (MDB) residents, and policy and research experts. These boost groups offer valuable perspectives, yet their smaller sample sizes limit the statistical confidence we can place in complex analyses, especially when detecting typical or smaller associations. To avoid over-interpreting the data, we present straightforward frequencies — such as the percentage agreeing or disagreeing on key fairness items. These results highlight group-specific priorities and viewpoints, offering useful context and nuance beyond our nationally representative sample. However, the results are indicative rather than broadly generalisable, and should be considered complementary to our robust general population findings.

Fairness perspectives among First Nations respondents

First Nations respondents (n = 254) often differed substantially from the general population, especially in prioritising water for First Nations communities and emphasising distinct First Nations leadership roles. The next sections present straightforward frequencies—such as the percentage agreeing or disagreeing with these key fairness items—to highlight these differences clearly. Given smaller sample sizes, these results should be viewed as indicative insights rather than representative estimates; yet they offer valuable perspectives from First Nations respondents regarding what fairness demands in water policy decisions.

Figure 13 (p.32) maps a subset of First Nations' choices from our factorial survey experiment. Each respondent's views are positioned along two fairness choice dimensions:

- It's fairer to prioritise water for agriculture over water for the environment (horizontal axis)
- It's fairer to prioritise water for First Nations over water for the environment (vertical axis)

The largest group of First Nations respondents (40%) sits within the "Environment fairer than all other options" quadrant (bottom-left), indicating that for this group fairness is most strongly associated with prioritising environmental water over both agriculture and First Nations allocations. About 28% of respondents judge water for agriculture as fairer than for the environment and water for the environment as fairer than for First Nations (bottom-right quadrant), suggesting a notable preference for agricultural allocations over environmental water and environmental water ahead of First Nations water claims.

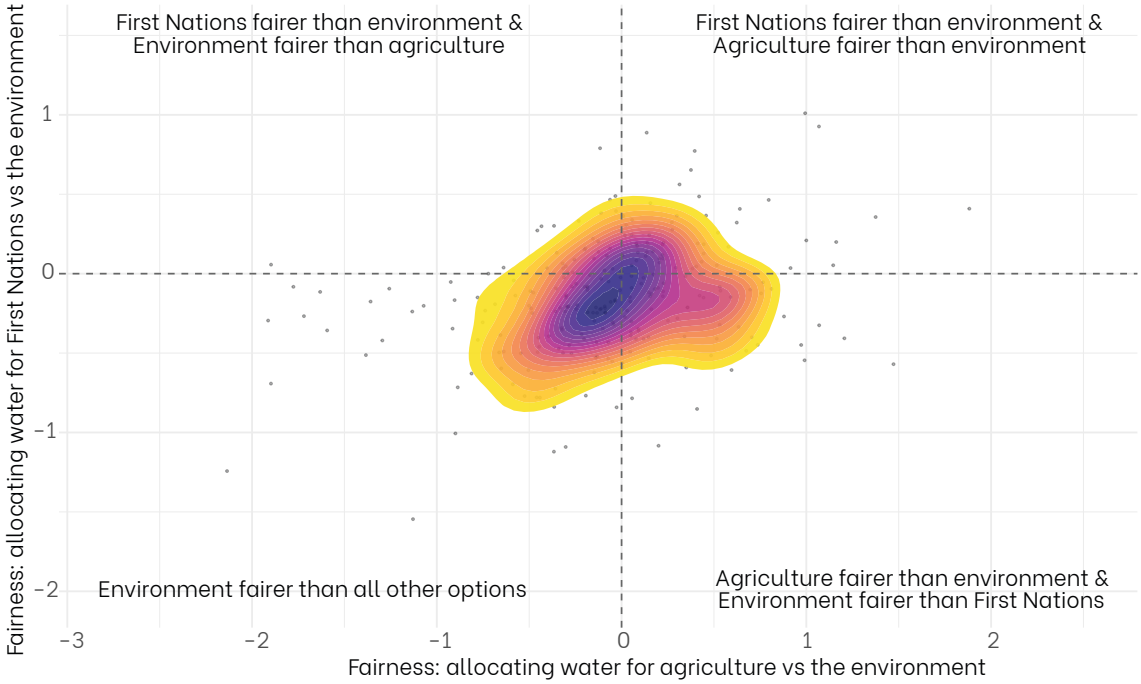


Figure 13: Density plot of First Nations' respondents fairness judgements about water allocation

Figure 13 notes: Distribution of First Nations respondents' (n = 254) fairness judgements about water allocation trade-offs. Each point represents one respondent. Coloured contours indicate density, with darker areas showing higher densities of respondent fairness judgements. The largest group (40%) sees water for the environment as fairer than all other options; the next largest group (28%) sees water for agriculture as fairer than for the environment and water for the environment as fairer than for First Nations; 19% of respondents believe fairness requires prioritising water for agriculture over the environment and water for the environment over First Nations; the smallest group (10%) judge fairness requiring water for First Nations over the environment and water for the environment over agriculture.

A meaningful proportion (approximately 19%) of First Nations' respondents felt fairness required prioritising both First Nations' water and agricultural water above environmental allocations (top-right quadrant). The smallest group (10%) saw fairness as putting First Nations' water above the environment, while still placing environmental water as fairer than water for agriculture (top-left quadrant).

Figure 14 (p.33) shows that First Nations respondents were somewhat less likely than the general population to judge prioritising agriculture over the environment as fair. However, a significant proportion (36%) still considered it fair to prioritise water for agriculture over the environment. Prioritising water for First Nations over environmental needs was viewed as fairer by First Nations respondents than by the general population. However, over two-thirds of First Nations respondents still viewed this as unfair or very unfair, a proportion not significantly different from the general population.

First Nations respondents were more inclined to view holding a distinct leadership role over a special advisory role as fair compared to the general population's view (Figure 15, p.33). Similarly, First Nations respondents saw equivalent stakeholder roles over special advisory roles as nearly twice as unfair than the general population, highlighting clear differences in expectations of their role in policy processes and potentially a view that First Nations' are not a "stakeholder" at all, but a distinct people with pre-existing rights and responsibilities for Country.

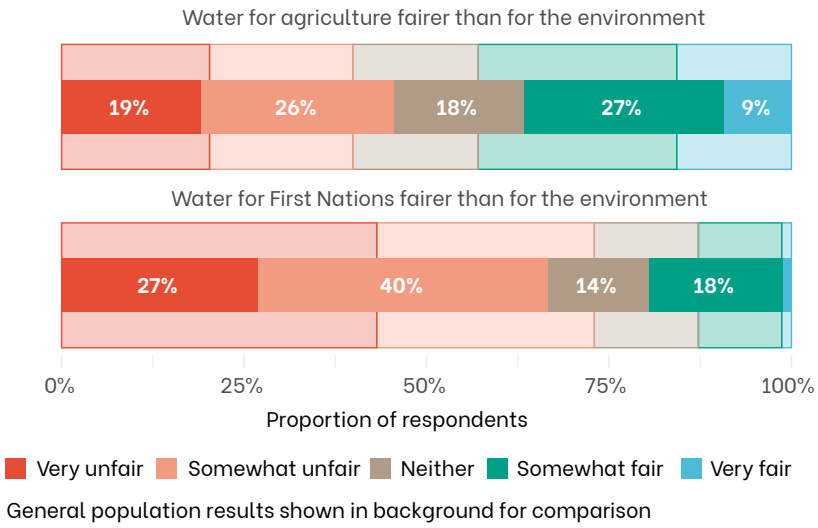


Figure 14: Distribution of First Nations respondents' fairness judgements on water allocations.

Figure 14 note: The shaded larger bars in the background show the general population sample responses for comparison.

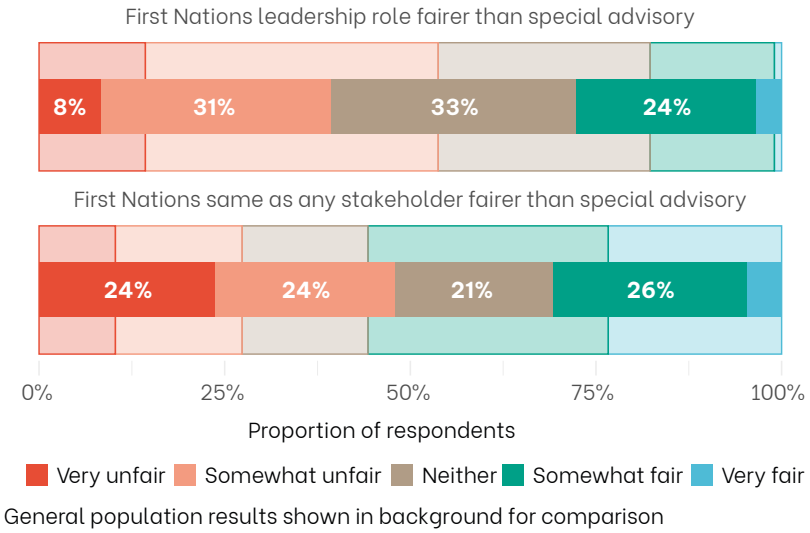


Figure 15: First Nations respondents' fairness judgements on First Nations roles in policy decisions.

Figure 15 note: The shaded larger bars in the background show the general population sample responses for comparison.

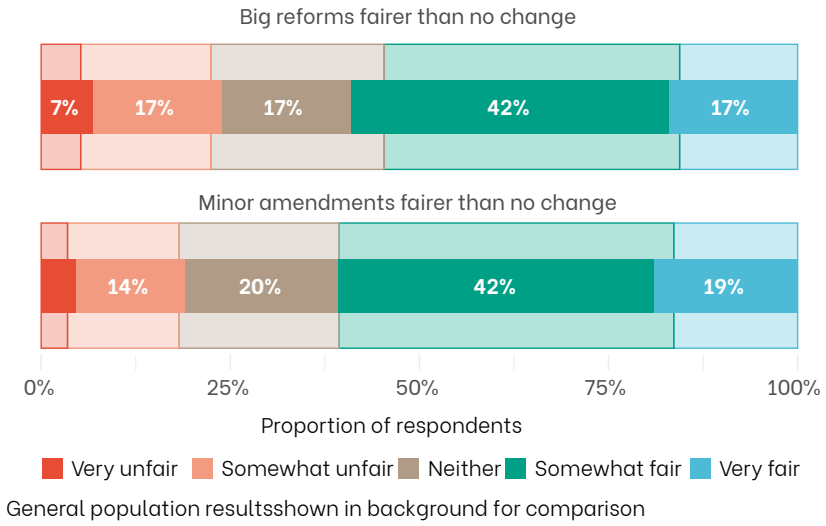


Figure 16: First Nations respondents' fairness judgements on the pace and kind of policy change.

Figure 16 notes: The shaded larger bars in the background show the general population sample responses for comparison.

A majority of First Nations respondents, like the general population, considered incremental change or big reforms as fairer than the status quo. They held big reforms to be more fair than no change at a slightly higher rate than the general population (Figure 16).

First Nations had a greater confidence that experts and researchers influence in policy decisions was fair than the general population and were almost twice as likely to see the influence of the majority of Australians over experts as very unfair. They were more likely than the general population to see the influence of those most affected by a decision over experts as very unfair, fair and very fair illustrating a significant division of opinion on this issue (Figure 17).

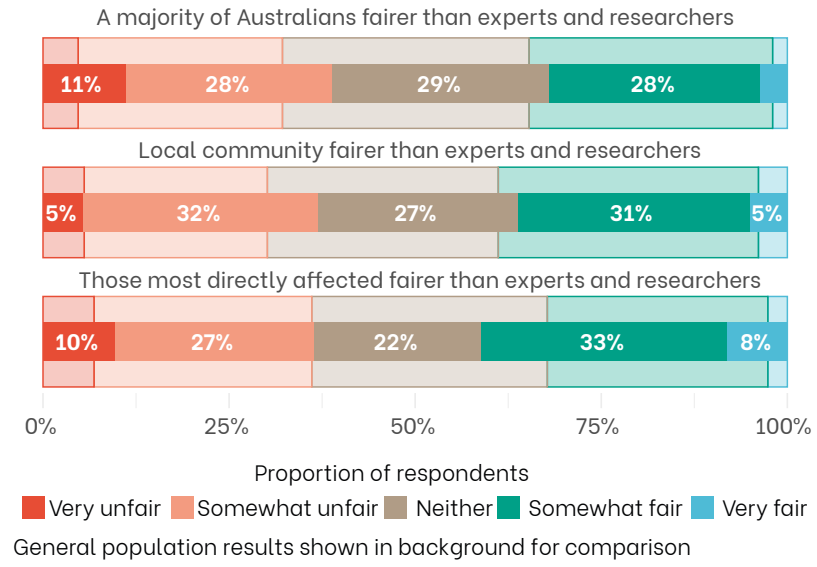


Figure 17: First Nations respondents' fairness judgements on whose knowledge and views should be most influential in policy decisions.

Figure 17 notes: The shaded larger bars in the background show the general population sample responses for comparison.

Fairness perspectives among policy experts and researchers

We also surveyed a boost sample of water policy experts and researchers (n = 105) who provide valuable indicative insights. Experts and researchers in our sample hold markedly different views from the general population regarding what fairness requires in water allocation. However, these findings should be interpreted cautiously due to the potential for sampling bias and limited statistical power.

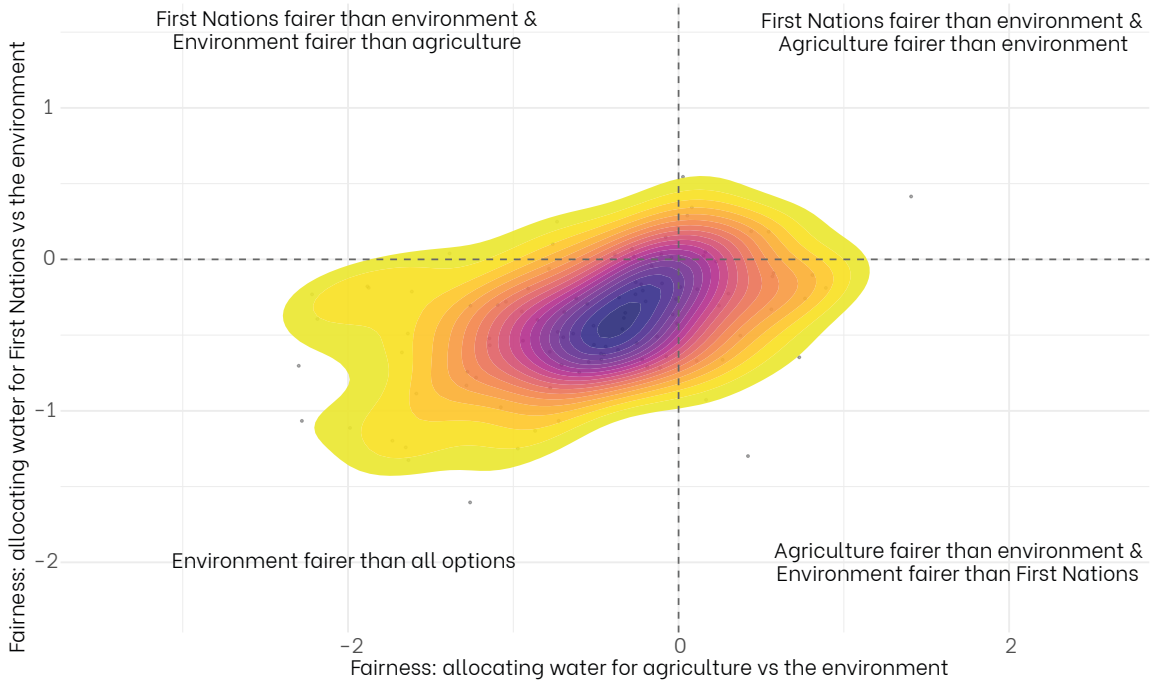


Figure 18: Density plot of expert and researcher respondents' fairness judgements about water allocation.

Figure 18 notes: Distribution of experts and researcher respondents' (n = 105) fairness judgements about water allocation trade-offs. Each point represents one respondent. Coloured contours indicate density, with darker areas showing higher densities of respondent fairness judgements. The largest group (63%) sees water for the environment as fairer than all other options; the next largest group (19%) sees water for agriculture as fairer than for the environment and water for the environment as fairer than for First Nations; 10% of respondents believe fairness requires prioritising water for agriculture over the environment and water for the environment over First Nations; the smallest group (8%) judge fairness requiring water for First Nations over the environment and water for the environment over agriculture.

Figure 18 maps a subset of experts' and researchers' choices from our factorial survey experiment. Each respondent's views are positioned along two fairness choice dimensions:

- It's fairer to prioritise water for agriculture over water for the environment (horizontal axis)
- It's fairer to prioritise water for First Nations over water for the environment (vertical axis)

Most experts (63%) judged prioritising water for the environment over both agricultural and First Nations water claims as fairest – nearly double the proportion found in the general population (33%). In contrast, less than one-fifth (19%) considered prioritising agriculture over the environment and the environment over First Nations to be fair, half that of the general population (41%).

Very few experts and researchers judged it fairer to prioritise water for First Nations over the environment as well as water for agriculture over the environment (10%). A similarly small proportion judged it fairer to prioritise water for First Nations over the environment and water for the environment over agriculture (8%), providing a more even distribution between the top two quadrants compared to the general population. These results underline a pronounced expert emphasis on environmental priorities as central to fairness, diverging significantly from the general public's stronger emphasis on agricultural interests.

The distinct gap between expert views and those of the general population underscores a key challenge for policy makers. Policies informed predominantly by expert advice may not align with public perceptions of fairness, potentially increasing resistance or undermining legitimacy. This mismatch highlights the importance of engaging in inclusive and deliberative processes to bridge gaps between technical recommendations and broader community values.

Experts and researchers are considerably less likely than the general population to see prioritising agriculture over the environment as fair, with nearly three-quarters viewing this as unfair or very unfair (Figure 19). They are also less likely than the general population to see prioritising First Nations water needs over the environment as fair, with four-fifths viewing this as unfair or very unfair.

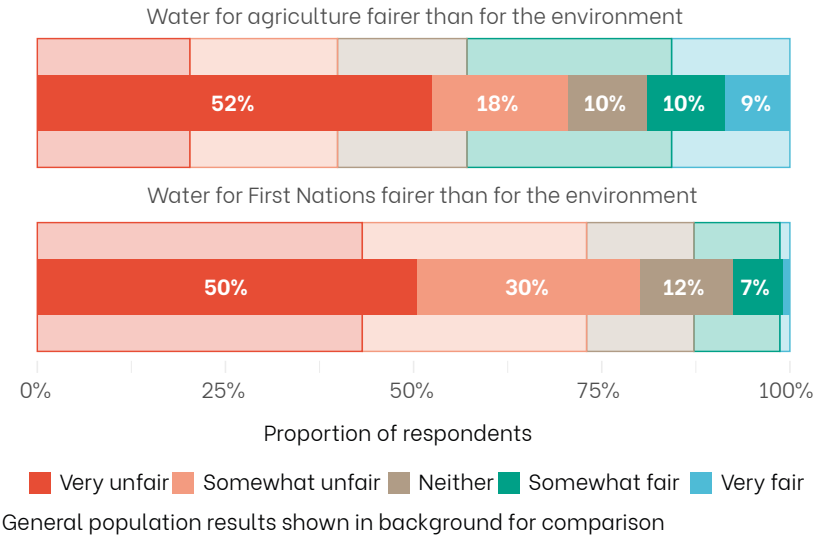


Figure 19: Expert and researcher respondents' fairness judgements on water allocation.

Figure 19 notes: The shaded larger bars in the background show the general population sample responses for comparison.

Experts and researchers in our sample are strong supporters of differentiated roles for First Nations in policy making. Experts were more than twice as likely than the general population to see First Nations holding a distinct leadership role in water policy as fair (Figure 20, p.37). They were also much more likely than the general population to consider First Nations having a role like any other stakeholder in policy processes as unfair, with almost half rejecting this view.

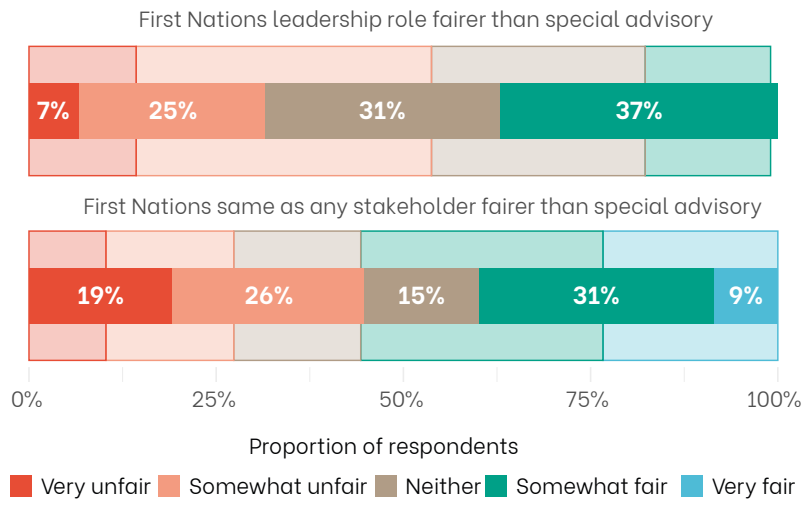


Figure 20: Expert and researcher respondents' fairness judgements on First Nations' roles in policy decision making.

Figure 20 notes: The shaded larger bars in the background show the general population sample responses for comparison.

Experts and researchers were much more likely than the general population to consider big reforms and minor amendments as fairer than no change, with nearly three-quarters seeing big reforms as fairer than no change (Figure 21) and close to four-fifths holding minor amendments fairer. This strong appetite for reform among experts parallels their strong views on environmental water and First Nations rights.

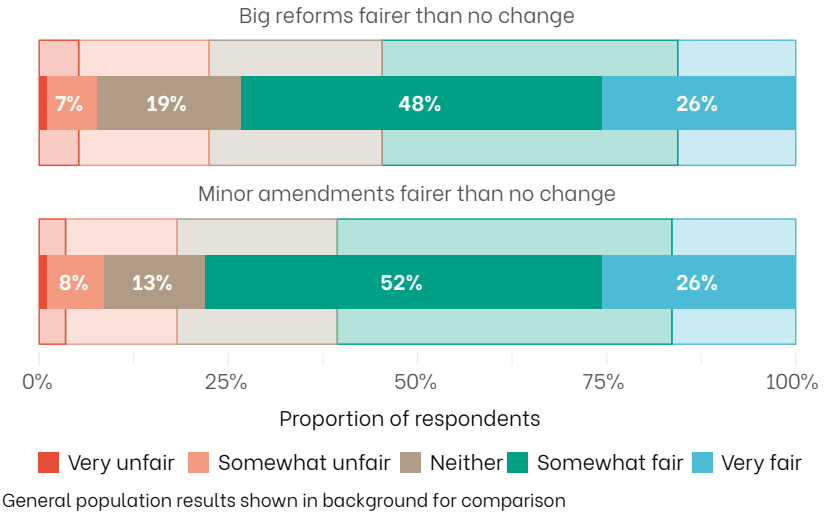


Figure 21: Expert and researcher respondents' fairness judgements on the pace and kind of policy change.

Figure 21 notes: The shaded larger bars in the background show the general population sample responses for comparison.

However, experts and researchers were less likely than the general population to see local community or majority view influence over policy as fair compared with expert influence. They were more likely to see the influence of those most affected by a decision as fairer than experts and researchers (Figure 22).

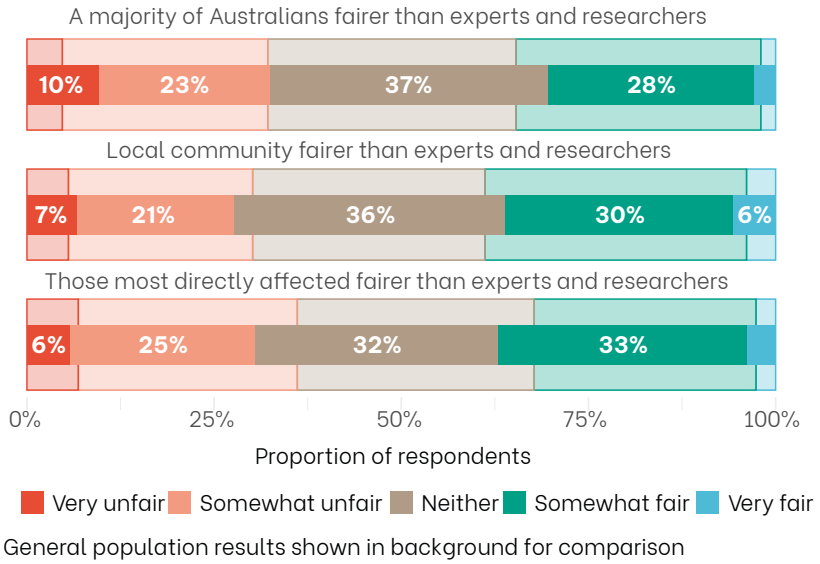


Figure 22 notes: The shaded larger bars in the background show the general population sample responses for comparison.

Figure 22: Expert and researcher respondents' fairness judgements on whose knowledge and views should be most influential in policy decisions.

Fairness perspectives among outer regional and remote respondents

Outer regional and remote respondents (n = 308) were recruited from ABS-classified outer regional, remote and very remote areas (see Figure 23). Their fairness judgements on water allocation broadly align with those of the general population on some issues. However, there are notable differences in emphasis and differences with other boost groups. Such divergences are an important consideration for policy makers aiming to develop broadly supported water policies. Given the modest sample size, these results should be viewed as indicative insights rather than precise estimates.

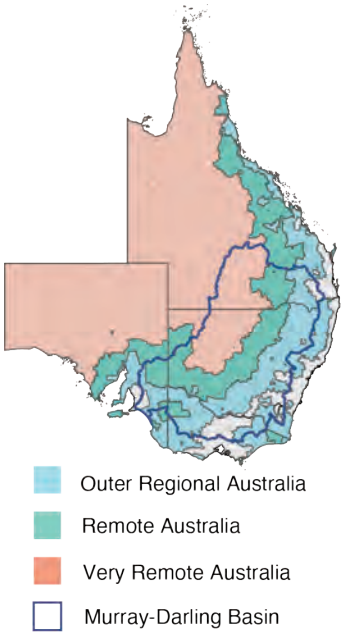


Figure 23: ABS outer regional, remote and very remote areas

Our respondents for this boost sample resided in one of these three areas. (The remaining light grey areas are ABS inner regional and major city areas.)

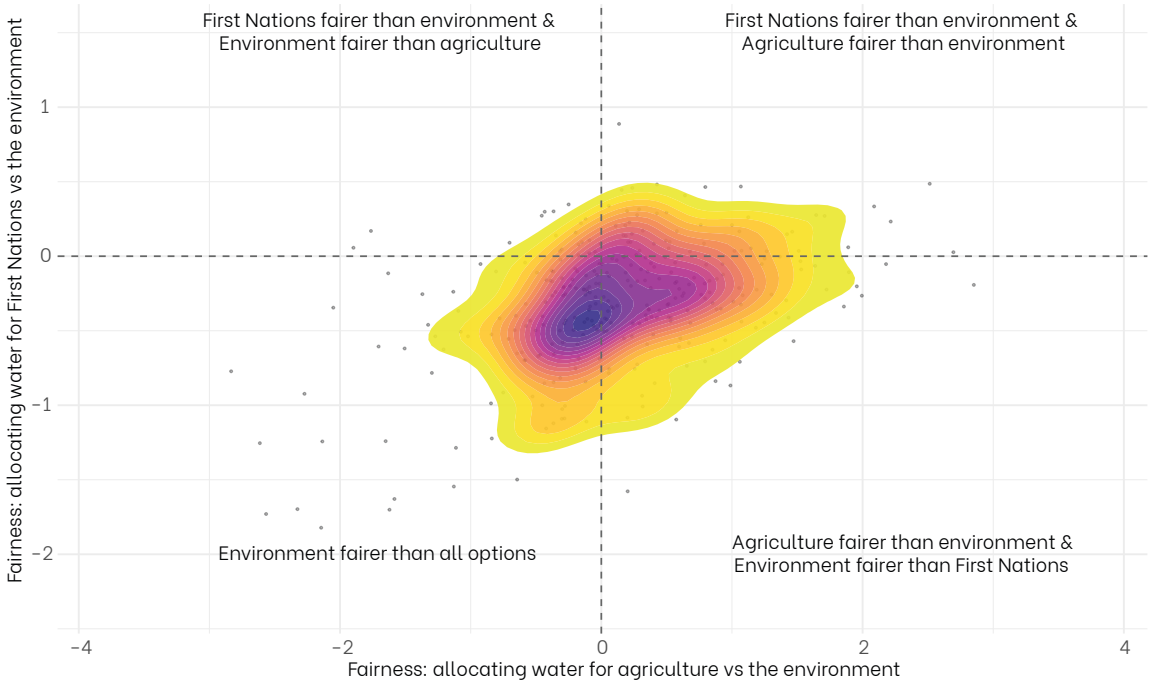


Figure 24: Density plot of regional and remote respondents fairness judgements about water allocation

Figure 24 notes: Distribution of regional and remote respondents' (n = 308) fairness judgements about water allocation trade-offs. Each point represents one respondent. Coloured contours indicate density, with darker areas showing higher densities of respondent fairness judgements. The two largest groups (39% and 38%) judge water for the environment as fairer than all other options and water for agriculture as fairer than water for the environment and water for the environment as fairer than for First Nations respectively; 17% of respondents believe fairness requires prioritising water for agriculture over the environment and water for the environment over First Nations; the smallest group (4%) judge fairness requiring water for First Nations over the environment and water for the environment over agriculture.

Figure 24 maps a subset of outer regional and remote respondents' choices from our factorial survey experiment. Each respondent's views are positioned along two fairness choice dimensions:

- It's fairer to prioritise water for agriculture over water for the environment (horizontal axis)
- It's fairer to prioritise water for First Nations over water for the environment (vertical axis)

Regional and remote respondents were about equally likely as the general population to judge it fair to prioritise water for the agriculture over the environment and water for the environment over First Nations (38%). However, they are somewhat more likely than the general population to judge it fair to allocate water for the environment over all other options (39%). They are about as likely to judge it fairer for water to be allocated to First Nations over the environment and agriculture over the environment (17%). However, they are only about half as likely to judge it fair to allocate water to First Nations over the environment and the environment over agriculture (4%).

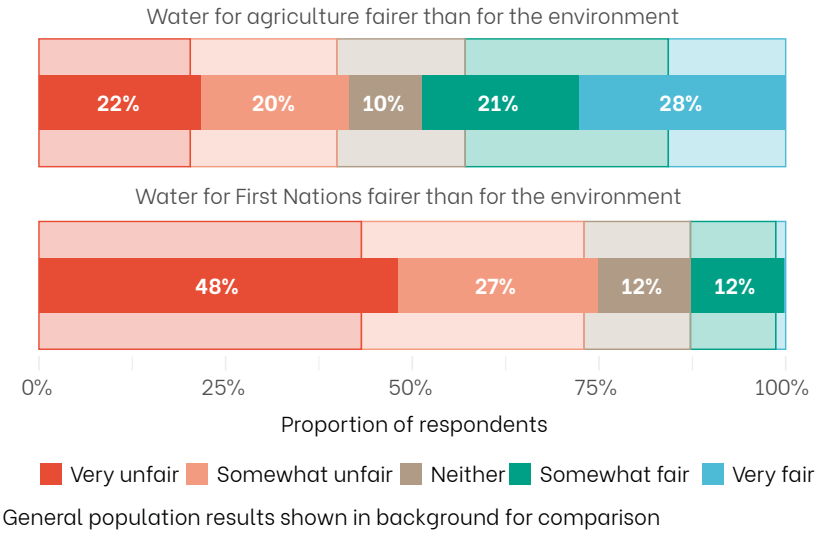


Figure 25: Regional and remote respondents' fairness judgements on water allocation.

Figure 25 notes: The shaded larger bars in the background show the general population sample responses for comparison.

Figure 25 shows that regional and remote respondents were also more likely to see water for First Nations over the environment as very unfair and unfair, and less likely to see it as very fair.

Figure 26 shows that despite their views on water allocations to First Nations, regional and remote respondents were more likely than the general population to consider First Nations holding a distinct leadership role in water policy as fair and less likely to see this as unfair. Their views on First Nations having an equivalent role to any other stakeholder in policy making were similar to the general population, with a majority seeing this as fair or very fair.

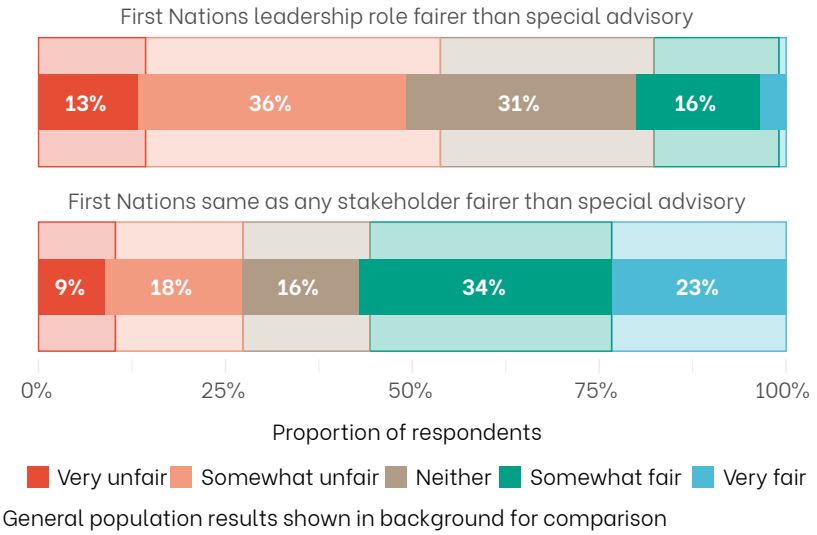


Figure 26: Regional and remote respondents' fairness judgements on First Nations' roles in policy decision making.

Figure 26 notes: The shaded larger bars in the background show the general population sample responses for comparison.

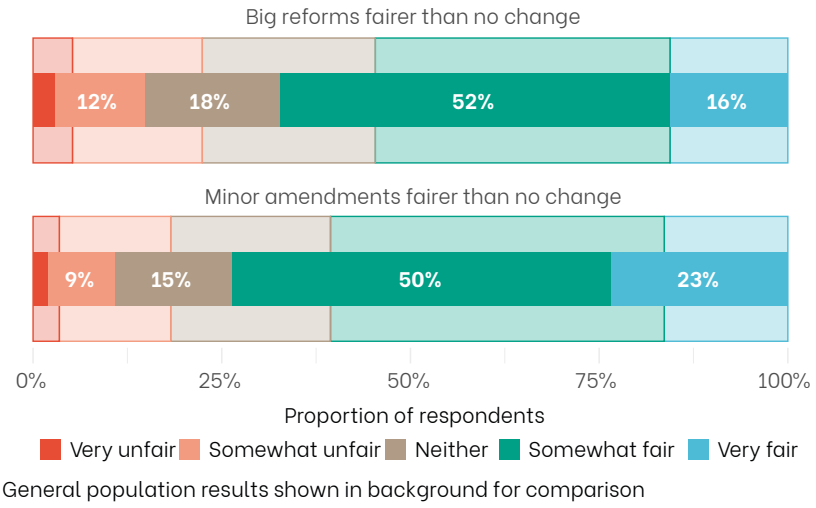


Figure 27: Regional and remote respondents' fairness judgements on the pace and kind of policy change.

Figure 27 notes: The shaded larger bars in the background show the general population sample responses for comparison.

Regional and remote respondents were considerably more likely than the general population to consider big reforms and minor amendments as fairer than no change (Figure 27), potentially reflecting regional concerns about the impacts of current policy settings.

Leadership roles in influencing policy for local communities or those most affected by a decision were seen as much fairer by regional and remote respondents than by the general population (Figure 28).

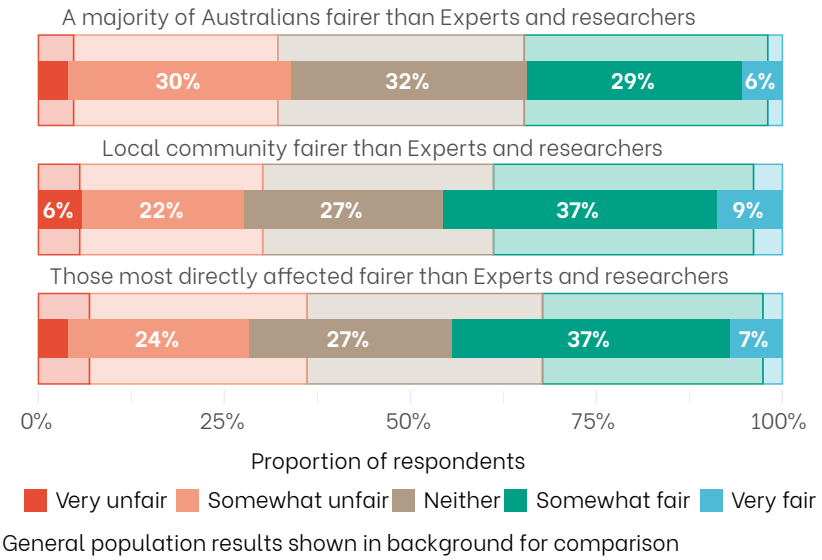


Figure 28: Regional and remote respondents' fairness judgements on whose knowledge and views should be most influential in policy decisions.

Figure 28 notes: The shaded larger bars in the background show the general population sample responses for comparison.

This preference for local voices and expertise in influencing water policy decisions likely reflects concerns with what is perceived as centralised decision-making happening by governments removed from the realities of outer regional and remote communities. These insights highlight how direct local experiences and proximity to water policy implementation influence residents' fairness priorities and judgements.

Fairness perspectives among Murray–Darling Basin residents

Respondents living in the Murray–Darling Basin (MDB, n = 963) show a marked divergence in some responses along location lines (major city/regional). The larger sample size for MDB residents allows for relatively greater confidence in these indicative findings. However, as with other boost groups, results are less robust than for our representative general population sample.

Figure 29 maps a subset of MDB residents' choices from our factorial survey experiment. Each respondent's views are positioned along two fairness choice dimensions:

- It's fairer to prioritise water for agriculture over water for the environment (horizontal axis)
- It's fairer to prioritise water for First Nations over water for the environment (vertical axis)

The split between the lower two quadrants is essentially even, with a larger proportion and stronger views in the environment fairer than all other options quadrant. Strong views in this quadrant are correlated with major city residence suggesting the influence of the ACT in particular whose residents are significantly more likely to see environmental water as fairer than agricultural water. A smaller proportion of MDB respondents are located in the top left quadrant (First Nations fairer than environment and environment fairer than agriculture compared with the general population.

Figure 29 notes: Distribution of regional and remote respondents' (n = 308) fairness judgements about water allocation trade-offs. Each point represents one respondent. Coloured contours indicate density, with darker areas showing higher densities of respondent fairness judgements. The two largest groups (39% and 38%) judge water for the environment as fairer than all other options and water for agriculture as fairer than water for the environment and water for the environment as fairer than for First Nations respectively; 17% of respondents believe fairness requires prioritising water for agriculture over the environment and water for the environment over First Nations; the smallest group (4%) judge fairness requiring water for First Nations over the environment and water for the environment over agriculture.

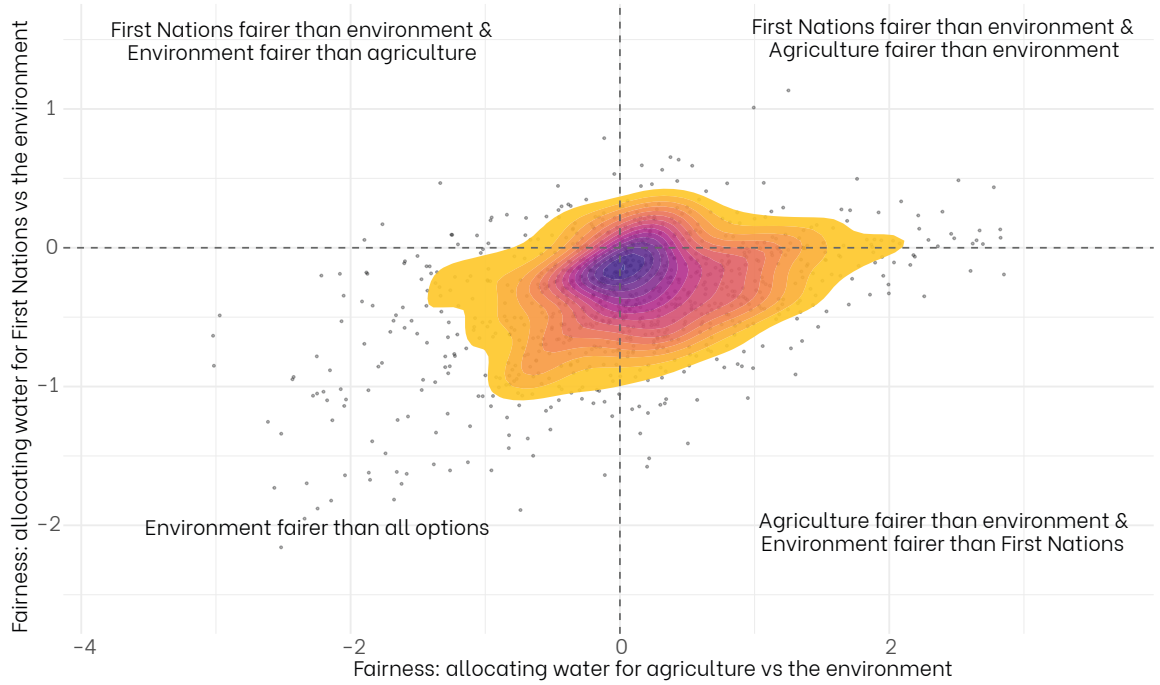


Figure 29: Density plot of MDB resident respondents' fairness judgements about water allocation.

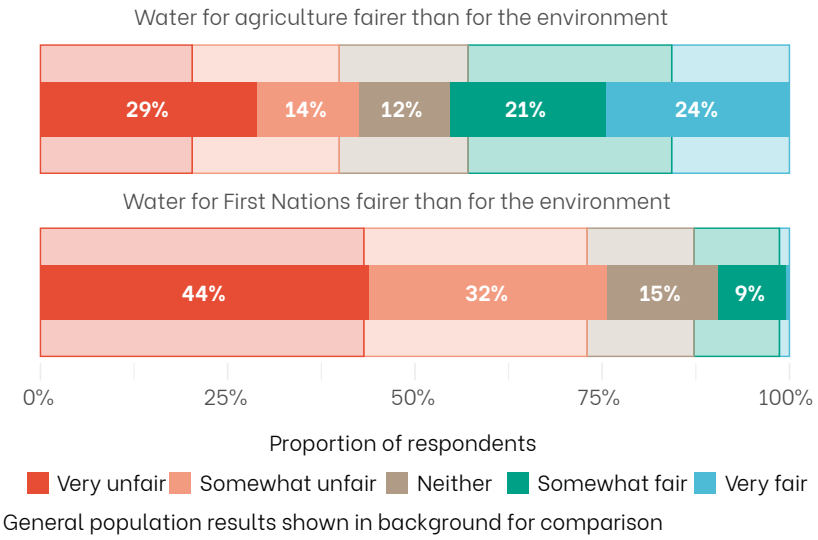


Figure 30: MDB resident respondents' fairness judgements on water allocation.

Figure 30 notes: The shaded larger bars in the background show the general population sample responses for comparison.

Like the outer regional and remote sample, MDB residents are more likely to consider water for agriculture over the environment as fair, and unfair, compared with the general population. MDB residents are also more likely to hold stronger fairness views on this issue compared with the general population and there are fewer respondents with neutral views. MDB residents are also slightly more likely than the general population to see water for First Nations as unfair (Figure 30).

In contrast, MDB residents are less likely than the general population to consider First Nations leadership roles in water policy making as unfair and slightly more likely to see such roles as fair. Their response on the fairness of First Nations holding equivalent roles in water policy making to other stakeholders are not significantly different from the general population (Figure 31, p.43).

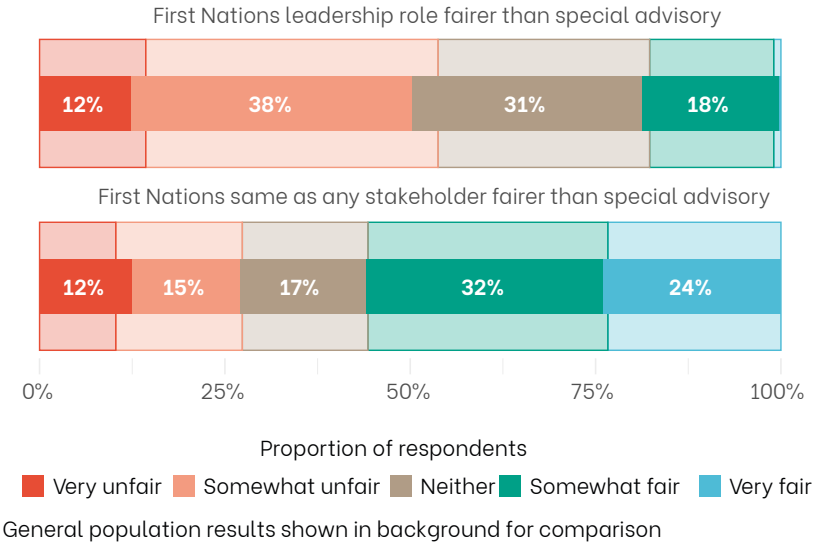


Figure 31: MDB resident respondents' fairness judgements on First Nations' roles in policy decision making.

Figure 31 notes: The shaded larger bars in the background show the general population sample responses for comparison.

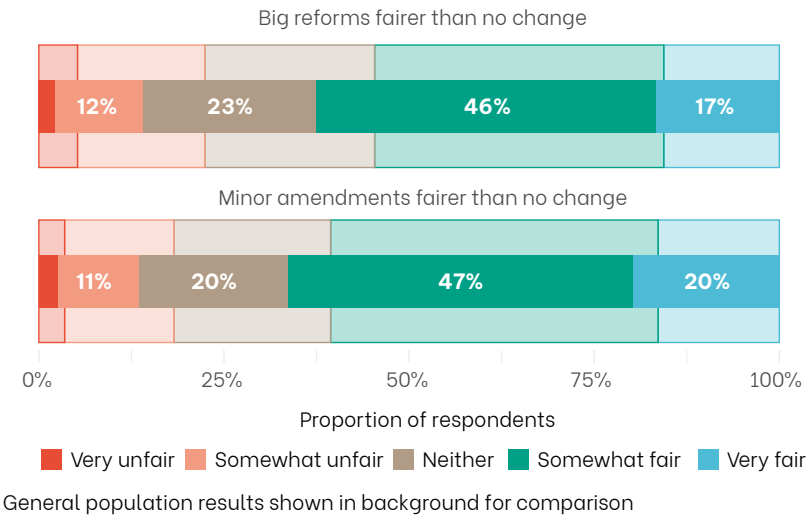


Figure 32: MDB resident respondents' fairness judgements on the pace and kind of policy change.

Figure 32 notes: The shaded larger bars in the background show the general population sample responses for comparison.

Basin residents are significantly more likely than the general population to see reforms and amendments as fairer than no change, with nearly three-quarters of respondents supporting minor amendments over no change and over two-thirds supporting big reforms over no change (Figure 32). This strong appetite for change among Basin residents likely reflects greater awareness of the ongoing challenges and controversies surrounding water policy in the region.

Like regional and remote respondents, Basin residents are more likely than the general population to see local communities and those most affected by a decision as fairer than experts and researchers in influencing policy decisions (Figure 33). This shared preference for local voices over expertise in shaping and influencing water policy should be noted by policy makers.

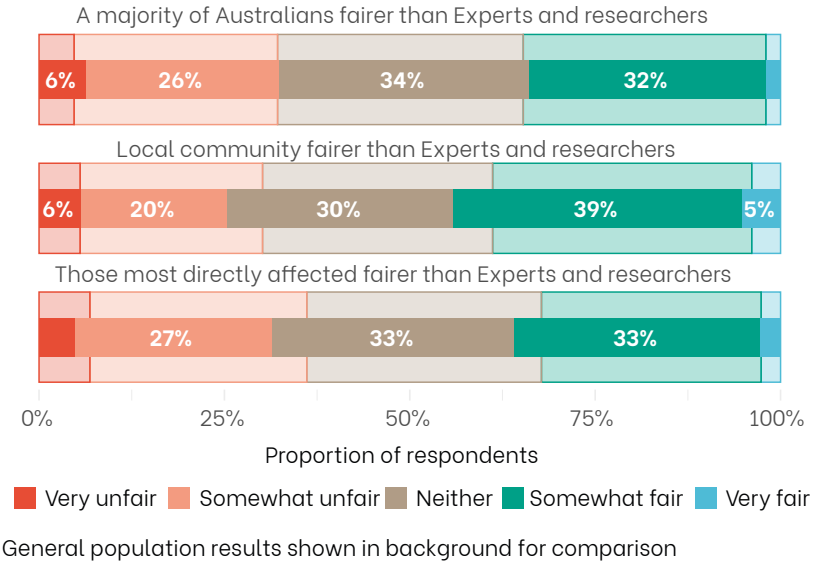


Figure 33: MDB resident respondents' fairness judgements on whose knowledge and views should be most influential in policy decisions.

Figure 33 notes: The shaded larger bars in the background show the general population sample responses for comparison.

Boost groups and values

The general population sample offers a cautious baseline for comparing responses on the values indices: roughly half endorse procedural fairness norms, local autonomy and nature stewardship. Views on First Nations recognition are evenly split around a neutral group. More of the sample disagrees than agrees with *fragile nature and ecological crisis*, but the difference is not great (Figure 34).

First Nations respondents are substantially different from the general population on their own recognition. They show stronger agreement with *fragile nature*, *local autonomy* and *nature stewardship*, with clear majorities backing all three. Their enthusiasm for *fairness process norms* trails the general public's.

Experts diverge most sharply from the general population and other boost groups: overwhelming majorities champion *fairness process norms*, *First Nations recognition*, *nature stewardship*, and *fragile nature and ecological crisis*, while almost uniformly dismissing *local autonomy*.

Figure 34 notes: The shaded larger bars in the background show the general population sample responses for comparison. While all groups diverge somewhat from the general population sample, the expert and researchers group diverges most markedly from the general population and the other boost groups. Any generalisation from boost group responses should be approached cautiously as they are not as representative as the general population sample.

General population results shown in background for comparison

Figure 34: Comparison of values index distributions across boost groups

Murray–Darling Basin resident and regional and remote respondents are closest to each other and to the general population sample. They both show substantial majorities agreeing with *nature stewardship*, though with a notable absence of strong agreement. They are more likely to resonate with *fragile nature and ecological crises*, however, there are substantial minorities who disagree with this view. They are close to, or more positive on *First Nations recognition* than the general population sample and considerably more likely to agree with *fairness process norms*.

Key messages for policy makers

- Different groups hold distinct, stable, and deeply held views about fairness in water policy. Policy makers need to explicitly acknowledge these differences in fairness conceptions, recognising that policies perceived as fair by one group may not be considered fair by another.
- Significant divergences between expert views and public perspectives can pose challenges for policy legitimacy. Policy makers must bridge the gap between technical expertise (strongly aligned with environmental outcomes) and community priorities (often agricultural and locally-focused) through genuine engagement and inclusive dialogue.
- Expert-driven water policies typically prioritise environmental outcomes, while public views, especially among regional and agricultural communities, lean toward balancing environmental concerns with agriculture and local community priorities. Acknowledging this divergence is critical for designing policies that resonate with, rather than alienate, communities.
- First Nations respondents prioritise distinct leadership and special advisory roles, underscoring the need for culturally appropriate, differentiated policy responses. However, such differentiated roles are likely to be seen as unfair by a substantial proportion of key stakeholders and the general public, highlighting the need for careful consideration of how First Nations' rights and roles are framed in policy discussions.
- Regional, remote, and MDB residents strongly emphasise local decision-making, reflecting lived experiences and scepticism toward centralised or expert-driven processes. Policy makers must prioritise meaningful local engagement, giving communities a clear voice in shaping water decisions to achieve legitimacy and fairness.
- Boost sample insights highlight the importance of treating policy development as a negotiation between competing, legitimate fairness claims. Policy makers should identify their own values and identities, particularly if they differ from those of key stakeholders, and adopt principled negotiation approaches—identifying shared interests, openly discussing trade-offs, and transparently addressing competing fairness priorities.

Technical summary

Fairness is pivotal for policy success, fostering public trust, legitimacy, and compliance in democratic systems—particularly in resource domains like water, where inequities can provoke backlash and undermine governance. Our study employed a factorial survey experiment with constrained trade-offs, supplemented by value indices and demographic questions, to map fairness perceptions across a representative sample and boosts, revealing value-driven divides without assuming uniformity.

Fieldwork spanned February 28 to March 26, 2025, with a 15-minute survey optimised for engagement. The general population sample used a blended online panel (Ipsos iSay, Octopus, PureProfile) with quotas for age, gender, and location, weighted to 2021 ABS Census benchmarks on five dimensions for representativeness. Boosts provided indicative insights via purposive sampling, with dual weighting for sub-analyses; government employees were under-represented, warranting future targeted research.

Policy experts and researchers were recruited from the Fellows and Friends of the Peter Cullen Trust and extensive citation searches for highly-cited researchers publishing on Murray-Darling Basin water policy and management topics. Three-quarters of our experts and researchers were from Science, Technology, Engineering, and Mathematics (STEM) disciplines, with the remaining quarter from Humanities, Arts, and Social Sciences (HASS) disciplines. Murray-Darling Basin and outer regional and remote respondents were recruited using Ipsos panels supplemented with the University of Canberra's regional wellbeing survey panel. First Nations respondents were primarily recruited from Ipsos iMob panels supplemented from the University of Canberra's regional wellbeing survey panel

Generalisability is strong for the weighted general sample but limited for boosts due to size and non-probabilistic recruitment, though blending reduces single-source bias. Limitations include potential under-representation of low-internet-access groups and cognitive demands from complex vignettes, potentially triggering heuristic responses.

The factorial experiment featured five factors (e.g., allocation priorities, First Nations roles) with 3-4 levels each, yielding a balanced orthogonal design of 72 scenarios (D-efficiency 98.1% post-adjustment to remove implausible combinations). Randomised blocks presented 12 vignettes per respondent as narratives, rated on a 5-point fairness Likert scale. Hierarchical Bayes Regression (HBREG) modelled individual utilities, enabling predictions for all 324 combinations.

Factorial survey

We varied five policy dimensions ("factors") within the vignettes, each with the following set of outcomes:

Water allocation

- water for agricultural, economic and community benefit despite any negative environmental impacts.
- water for environmental protection and restoration despite any negative economic impacts for businesses and communities
- water for First Nations Peoples despite any impacts on water allocations for other interests

Role of First Nations Peoples in decision-making

- a leadership role
- a special advisory role
- the same role as any other stakeholder

Government leading consultation

- local government
- a state government
- federal government

Whose knowledge and views has policy influence

- knowledge and views of the local community
- knowledge and views of experts and researchers
- knowledge and views of those most directly affected
- views of a majority of Australians

Policy change and reform

- the decision is final and there will be no changes for the foreseeable future
- decision makers will make minor amendments periodically as required
- decision makers will continue making big reforms.

Values indices

We constructed five values responses to the following groups of statements drawn from well-used indices like the New Ecological Paradigm[6] or prior qualitative interviews. Likert responses were rescaled to 0-100 then z-scored for comparability, with reverse-coding to avoid cross-index artefacts. Each index was validated via classical and modern reliability analysis (α ranges 0.59 to 0.86; ω ranges 0.63 to 0.87, four of five indices $\omega > 0.7$; with factor analysis confirming unidimensionality and no cross-loadings).

Fragile nature & ecological crisis index

- When humans interfere with nature it often produces disastrous consequences.
- If things continue on their present course, we will experience a major ecological catastrophe.
- Nature is strong enough to cope with the impacts of modern societies. (reverse-coded)
- Humans have the right to modify the natural environment to suit their needs. (reverse-coded)

Stewardship index

- The environment's health is vital for our country's future prosperity.
- Australian farmers have a responsibility to manage their land in ways that impact the environment as little as possible.
- We owe it to future generations to protect the environment
- The environment should be protected for future generations, even if it cannot be fully restored.

First nations recognition index

- The wellbeing of First Nations communities is connected to the health of rivers and the environment.
- First Nations people have a right to access water for cultural, economic, and environmental purposes.
- We must address the historical exclusion of First Nations people from water ownership and decision-making.
- The Basin Plan must deliver positive and fair outcomes for Aboriginal communities.

Local autonomy index

- All sections of the community should have an equal opportunity to have a say in how Australia's natural resources are allocated.
- Local communities have better knowledge of their region than governments and experts.
- Decisions about water reform should be made by people who understand local realities, not distant policymakers.
- Investors and speculators should not be able to own water.

Fairness norms index

- Water reform policies should balance the needs of upstream and downstream communities equally.
- A consistent and transparent approach to water reform is the fairest way forward.
- Finding common ground among water users is important, even if it doesn't make everyone happy.
- Water policy is a complex problem, and there are no simple solutions.

Forced-choice A|B questions probed trade-offs (e.g., crisis vs. resilience), mitigating symbolic bias by mirroring real constraints, though potentially suppressing nuance—defensible for revealing hierarchies amid motivated reasoning and likely identity-protective cognition.

Exploratory factor analysis (EFA) with Promax (an oblique rotation) modelled the shared variance in respondents' value and fairness-preference data. Two conceptually coherent factors emerged—one contrasting agriculture versus environmental water allocation, the other capturing First Nations' decision-making roles. Partial Least Squares regression (PLS) subsequently validated the predictive power and substantive relevance of these latent dimensions for explaining fairness judgements. This integrated EFA–PLS approach ensures methodological robustness, interpretative clarity, and improved explanatory insight relative to Principal Component Analysis (PCA), which inflated the salience of certain outcomes due to distributional artefacts.

Bivariate OLS and logistic regression focused on the factors identified by EFA and PLS examining direct associations between underlying values, identities, and beliefs and respondents' fairness judgements. This simple modelling approach reduces multicollinearity risk arising from correlated demographic variables such as age, income, or occupation. Existing research supports the premise that values and political identities predominantly shape fairness perceptions, typically mediating rather than being driven by demographic characteristics. Our factorial survey design further mitigated potential confounding through randomisation.

Robustness checks incorporating demographic controls (age, sex, income, occupation) verified whether these factors substantially altered key associations. Controls produced minimal changes (typically <10%) in effect sizes and no changes in statistical significance. For example, associations between environmental values and judgements prioritising environmental water remained strong after demographic adjustments. This reinforces the conclusion that values and identities are the primary drivers of observed variation in fairness judgements.

Using DBSCAN,[28] a density-based clustering algorithm, we analysed UMAP-reduced, standardized utility scores and values indices to identify participants (n = 325) with unstable attitudes (noise) through 1,000 iterations of consensus clustering. Unlike k-means or latent class analysis, which force data into partitions, DBSCAN effectively detects unstable responses and flags them as noise. Consensus clustering enhances result robustness by aggregating multiple clustering outcomes.[29] Removing respondents with unstable views significantly increased regression effect sizes while preserving statistical power. We report results for the full sample here without removing participants with unstable or noisy viewpoints. Notably, the presence of respondents with unstructured or unstable views is not unusual but reflects a common characteristic of democratic publics.[35]

References

1 Auspurg, K. and Hinz, T., 2014. Factorial survey experiments (Vol. 175). Sage Publications.

2 Hainmueller, J., Hangartner, D., Yamamoto, T., 2015. Validating vignette and conjoint survey experiments against real-world behavior. Proc. Natl. Acad. Sci. U.S.A. 112, 2395–2400.

3 Barnes, L., Blumenau, J. and Lauderdale, B.E., 2022. Measuring attitudes toward public spending using a multivariate tax summary experiment. American Journal of Political Science, 66(1), pp.205-221.

4 Kölln, A.K. and Wlezien, C., 2024. Measuring public preferences for government spending under constraints: a conjoint-analytic approach. Journal of Elections, Public Opinion and Parties, 34(2), pp.375-386.

5 J. Hainmueller, D. Hangartner, & T. Yamamoto, 2015. Validating vignette and conjoint survey experiments against real-world behavior, Proc. Natl. Acad. Sci. U.S.A. 112 (8) 2395-2400.

6 Johnson, C.Y., Bowker, J.M., Cordell, H.K., 2004. Ethnic Variation in Environmental Belief and Behavior: An Examination of the New Ecological Paradigm in a Social Psychological Context. Environment and Behavior 36, 157–186.

7 Vishwanath, A. (2025) 'The Impact of Values on Issue Stances: Evidence from Panel Studies', British Journal of Political Science, 55, p. e50.

8 Achen, C.H. and Bartels, L.M., 2016. Democracy for realists: Why elections do not produce responsive government. Princeton University Press.

9 Mason, L. and Wronski, J., 2018. One tribe to bind them all: How our social group attachments strengthen partisanship. Political Psychology, 39, pp.257-277.

10 Giampaolo Bonomi, Nicola Gennaioli, Guido Tabellini. 2021. Identity, Beliefs, and Political Conflict, The Quarterly Journal of Economics, Volume 136, Issue 4, 2371–2411.

11 Slater, M.D., 2007. Reinforcing spirals: The mutual influence of media selectivity and media effects and their impact on individual behavior and social identity. Communication theory, 17(3), pp.281-303; Slater, M.D., 2015. Reinforcing spirals model: Conceptualizing the relationship between media content exposure and the development and maintenance of attitudes. Media psychology, 18(3), pp.370-395.

12 Kertzer, J.D., Powers, K.E., Rathbun, B.C. and Iyer, R., 2014. Moral support: How moral values shape foreign policy attitudes. The Journal of Politics, 76(3), pp.825-840.

13 Williams, D., 2023. The marketplace of rationalizations. Economics and Philosophy 39, 99–123.

14 Slater, M.D., 2007. Reinforcing spirals: The mutual influence of media selectivity and media effects and their impact on individual behavior and social identity. Communication Theory, 17(3), pp.281–303; Slater, M.D., 2015. Reinforcing spirals model: Conceptualizing the relationship between media content exposure and the development and maintenance of attitudes. Media Psychology, 18(3), pp.370–395.

15 Williams, D., 2023. The marketplace of rationalizations. Economics and Philosophy 39, 99–123.

16 Slater, M.D., 2007. Reinforcing spirals: The mutual influence of media selectivity and media effects and their impact on individual behavior and social identity. Communication Theory, 17(3), pp.281–303; Slater, M.D., 2015. Reinforcing spirals model: Conceptualizing the relationship between media content exposure and the development and maintenance of attitudes. Media Psychology, 18(3), pp.370–395.

17 Hames, S., and Marsh, R.. 2025. Equity, Fairness and Justice Concepts in Public Inquiry Submissions and Social Media. Canberra: Watertrust Australia

18 Kulachai, W., Lerdtomornsakul, U. and Homyamyen, P., 2023. Factors influencing voting decision: a comprehensive literature review. Social Sciences, 12(9), p.469.

19 Saavedra Cisneros, A., Carey, T. E., Rogers, D. L., & Johnson, J. M. 2022. One size does not fit all: core political values and principles across race, ethnicity, and gender. Politics, Groups, and Identities, 11(4), 793–812.

20 Vishwanath, A., 2025. The Impact of Values on Issue Stances: Evidence from Panel Studies. British Journal of Political Science, 55, p.e50.

21 Larsen, E. G. 2022. "Effect sizes in political science", online, https://erikgahner.dk/2022/effect-sizes-in-political-science/. Accessed 15 July 2025.

22 Converse, P. E. 1964. "The Nature of Belief Systems in Mass Publics." Critical Review, 18(1–3), 1–74.

23 Alwin, D.F. and Krosnick, J.A., 1991. Aging, cohorts, and the stability of sociopolitical orientations over the life span. American Journal of Sociology, 97(1), pp.169–195.

24 Kahan, D.M., Peters, E., Dawson, E.C., Slovic, P., 2017. Motivated numeracy and enlightened self-government. Behavioural Public Policy, 1, pp.54–86.

25 Slater, M.D., 2007. Reinforcing spirals: The mutual influence of media selectivity and media effects and their impact on individual behavior and social identity. *Communication Theory*, 17(3), pp.281–303; Slater, M.D., 2015. Reinforcing spirals model: Conceptualizing the relationship between media content exposure and the development and maintenance of attitudes. *Media Psychology*, 18(3), pp.370–395.

26 Ansell, C. and Gash, A., 2008. Collaborative governance in theory and practice. Journal of Public Administration Research and Theory, 18(4), pp.543–571.

27 Kahan, D.M., 2015. Climate-science communication and the measurement problem. Political Psychology, 36(S1), pp.1–43.

28 Ester, M., Kriegel, H.P., Sander, J. and Xu, X., 1996, A density-based algorithm for discovering clusters in large spatial databases with noise. KDD Vol. 96, No. 34, pp. 226-231.

29 Monti, S., Tamayo, P., Mesirov, J. et al. 2003. Consensus Clustering: A Resampling-Based Method for Class Discovery and Visualization of Gene Expression Microarray Data. Machine Learning 52, 91–118.

30 Chiu, D.S., Talhouk, A. 2018. diceR: an R package for class discovery using an ensemble driven approach. BMC Bioinformatics 19, 11.

31 Mitchell, A et al. 2014. *Political Polarization & Media Habits.* Pew Research Centre.

32 Piketty, T. 2018. *Brahmin Left vs Merchant Right: Rising Inequality and the Changing Structure of Political Conflict*. WID.world WORKING PAPER SERIES 2018/7.

33 Piketty, T. 2020. *Capital and ideology*. (Trans. Arthur Goldhammer). Harvard University Press.

34 Gethin, A, Martínez-Toledano, C and Piketty, T. 2022. Brahmin Left Versus Merchant Right: Changing Political Cleavages in 21 Western Democracies, 1948–2020. The Quarterly Journal of Economics. 137 (1): 1–48.

35 Achen, C.H. and Bartels, L.M., 2016. Democracy for realists: Why elections do not produce responsive government. Princeton University Press.

Watertrust Australia Ltd