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The Contested Politics of Drought, Water Security and Climate Adaptation in Australia's Murray-Darling Basin

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ABSTRACT: Droughts are intensifying in many mid-latitude river basins due to climate change; therefore understanding the influence of droughts on water policy is crucial. This study of the politics of water reforms in Australia's Murray-Darling Basin (MDB) analyses contrasting discourses of water security during the Millennium Drought (1996-2010). The paper traces the historical evolution, mobilisation and effects of three discourses defined as 'drought-proofing', 'higher value use' and 'river restoration'. These are broadly aligned with engineering, economics and ecological perspectives, and while all discourses were integrated into government responses to the drought, the resurgence of drought-proofing significantly altered policy settings intended to shift MDB water management onto a more sustainable path. The paper illustrates the political and physical conditioning of water policy, placing drought responses in their historical context. The analysis demonstrates how policy actors used discourses of water security to define normative goals and legitimise policies, particularly when climatic extremes provide opportunities to influence policy outcomes. The paper provides three key insights for water governance and climate adaptation: first, drought responses can have far-reaching effects for water governance and policy trajectories; second, droughts pose challenges to positive climate adaptation when they revitalise heroic drought-proofing initiatives; and third, understanding the historical roots of contemporary drought responses is vital for effective climate adaptation.

KEYWORDS: Water security, water politics, drought, climate change adaptation, discourse, Murray-Darling Basin, Australia

INTRODUCTION

Concerns about water security are growing as the global water cycle intensifies under climate change, and the impacts of drought are increasing (IPCC, 2021). Analysis of climatic and hydrological extremes and associated disasters typically focus on biophysical, technical and socio-economic factors such as water scarcity, infrastructure, and social and environmental impacts. Interdisciplinary scholarship inspired by political ecology and the hydrosocial cycle, however, demonstrates that cultural conditions such as the relative cultural resonance and strategic power of different discourses – for example, the competing interpretations of 'water security' – are core determinants of water governance outcomes. Such discourses and their relative dominance are, in turn, influenced by sociophysical conditions such as drought.

In this paper, we examine policy responses to the Millennium Drought (1996-2010) in Australia's Murray-Darling Basin (MDB) in order to understand the discursive dynamics of water policy and its implications for climate adaptation. With more intense and frequent droughts projected for the MDB (CSIRO, 2012) and other mid-latitude river basins (Palmer et al., 2008; Sylla et al., 2018), critical

examination of Australia's experience in developing and reforming policy under extended drought conditions may offer insights of international relevance.

The paper is structured as follows. The next section describes the MDB context and outlines our theoretical perspective on the analysis of water security discourses. The subsequent section traces the historical evolution, mobilisation, and effects on policy development of three water security discourses: drought-proofing, highest value use, and river restoration. That section reviews the campaigns that were used to promote the ideals arising from these discourses during Australia's Millennium Drought and also examines the lasting legacy of the reforms initiated, particularly the Commonwealth Government's attempt to 'save' rivers and irrigation from the 'merciless' drought (Howard, 2007). The concluding section discusses the insights and implications arising from the analysis.

GOVERNANCE, CLIMATE AND WATER SECURITY

Murray-Darling Basin governance and drought

The Murray-Darling Basin is a politically defined hydrosocial territory (Boelens et al., 2016) that extends across four states in South Eastern Australia (Figure 1). Its polycentric system of governance depends on aligning local- and regional-scale governing entities such as local councils, irrigation trusts and catchment boards with broader scales of governing (Marshall et al., 2013). This alignment depends on a general consensus about rules, policies and values, because "multiple overlapping interests, responsibilities, and powers" mean that no single entity is in charge (Abel et al., 2016).

Extended drought periods are typical of South Eastern Australia's fluctuating climate (van Dijk et al., 2013). On two occasions, decadal droughts helped define the Australian nation's relationships with the rivers of the Murray-Darling Basin. Late in the 19th century, just before Australia became a federation in 1901, severe economic depression and the Federation Drought (1896-1905) had caused widespread poverty that energised the ideal of uniting the separate states into a fairer 'commonwealth' (Brett, 2017). However, the establishment of the Federation of Australia almost stalled as the states fought over the Murray River, but they resolved their disputes through coming to an agreement to establish the River Murray Commission with its planned mandate of joint management and consensus-based governance (Connell, 2007). The MDB's consensus-based governance model survived until early in the 21st century when, during the Millennium Drought (1996-2010), Australia's Commonwealth Government intervened to fundamentally alter these intergovernmental arrangements (which we describe below at more length) (Wanna, 2007).[1]

Both droughts elevated debates about the MDB to the nation's parliaments. Thus, agreement-making about the MDB during major droughts has a formative place in the nation's emergence and remains a central concern of the Federation. While the climatic circumstances provide context for these decisions, they alone are insufficient to explain significant policy decisions involving principles, politics and popularism. This paper seeks to explain how values, norms and beliefs, expressed in discourse, contribute to these decisions that shape institutional models of water governance.

Hydrosocial relations, weather and climate

Political ecology scholarship, including work on the hydrosocial cycle, emphasises the indisputable roles of cultural and environmental factors in shaping governance dynamics. This is because the hydrosocial cycle "is a dynamic historical and geographical process, meaning that the assemblage that gives rise to a particular kind of water and a particular socio-political configuration is always changing" (Linton and Budds 2014: 176). The recursive co-production of hydrosocial relations means that "any change in the physical presence of water, in institutional arrangements, in discursive constructions of water, or in the

[1] Dates of Australia's extended droughts are sourced from CSIRO (2012).

uses to which water are directed, has the potential to shift constellations of socio-nature towards a different set of relations" (Linton and Budds 2014: 174).

Figure 1. Map of the Murray-Darling Basin.

Source: Goesch et al. (2020).

One driver of shifts in hydrosocial relations is climate change (IPCC, 2021); it is helping "to produce new hydrosocial arrangements over space and time" (Budds et al., 2014). While many studies mention human-induced climate change as a future-oriented concern with social and political effects, few studies account for its influence in the present and for the ways that weather, climatic and related biophysical factors contribute to shaping socionatural hybrids (Rickards et al., 2017). During extreme periods, weather and climatic conditions draw attention from scholars and from the wider society; Closas (2020), for example, describes how water politics intensify during droughts in Barcelona. It is useful, however, to place climatic and hydrological extremes in their longer-term context because focusing on extreme conditions and disasters as bounded 'events' implicitly backgrounds longer-term climate change trends.

Droughts can be seized as windows of opportunity to catalyse positive policy change (as Berbel and Esteban, 2019, assert happened during droughts in Spain and Australia). Alternatively, reactive disaster responses can alter the hydrosocial assemblage, shaping interactions with future climatic events (Hoolohan and Browne, 2018) in maladaptive ways that entrench inequality and systemic vulnerability to

future stresses (Barnett and O'Neill, 2010). This leads to questions about how positive changes can be ushered in during droughts.

Co-evolving institutions and discourses

This paper draws on theories of governmentality (Dean, 2010) and critical institutionalism (Cleaver and de Koning, 2015) to help interpret how certain sets of meaning (expressed as discourses) combine with shifting physical conditions and other factors to influence Australia's water policies. Critical institutionalism emphasises the relationships between historical and modern arrangements, including the power relationships that animate formal and informal institutions (Cleaver and de Koning, 2015). These institutions build on their historical antecedents to reinforce the normative and cognitive frames that shape water governance (Hassenforder and Barone, 2018). Governmentality emphasises that governing depends on the production of consensus about accepted conduct, logics and normative frameworks (Dean, 2010; Cleaver and Franks, 2008). Discourses are central to the processes of producing the consensus needed for the generation and execution of policies. Discourse, here, refers to both communication (in various mediums including written, oral, visual, digital and symbolic) and the broader prioritisation of certain values and knowledge within a specific historical context (Foucault, 2002; Dean, 2010). Discourses legitimise policy directions, define normative goals, and prescribe what is considered to be valid knowledge (Allouche et al., 2019). They are central to the messy iterative processes of governing, with their competition for legitimacy and resources (Fuller, 2012; Nightingale, 2017).

Core to the study of discourses is attending to wider contexts and the way cultural values change over time. Applying this approach to water scholarship, Mollinga (2019) underlines the need to understand how different circumstances and causal mechanisms "at work in a given water situation combine and interact to produce particular logics and outcomes". He emphasises that discourses reflect the political utility of wider imaginaries for policy actors at particular points in time, including periods of crisis. Understanding water governance as "politically conditioned" in this way, points to the need for discourse analysis (Fairclough and Fairclough, 2012). This analysis needs to be politically attuned, cross-disciplinary, and historically informed. It also needs to incorporate shifting cultural imaginaries (such as those intertwined with nationalistic identities), climatic conditions and water flows, alongside proximate factors such as existing policy mechanisms and the power of political interest groups.

The spatial scale and complexity of water governance further highlight the need for an expansive, cross-disciplinary approach. Governing on the scale of river basins, like the Murray-Darling Basin as discussed in this paper, involves institutions that seek to regulate water and human affairs within multiscaled assemblages of technological, cultural and natural resources (McFarlane, 2009; Dittmer, 2013; Biggs, 2014). While governing institutions tend to be relatively stable at a macro level, in periods of flux they become entangled in shifts in values and imaginaries that determine the mainstream consensus that underpins policies (Meijerink and Huitema, 2010). These shifts can occur during periods of climate-driven crises, such as droughts, when political discourse and climatic conditions interact more potently. As we discuss below, at such times contrasting approaches to water security become more influential in policy debates.

Water security discourses

Water security is a contested 'master discourse' that emerged in the 1990s and proliferated early in the new millennium. There is substantial literature contesting the meaning of 'water security' that describes how different versions have contrasting effects (for example, Fischhendler, 2015; Pahl-Wostl et al., 2016; Varady et al., 2021). With the proliferation of water security discourses under accelerating climate change, more research needs to attend to "the contextual variables that trigger the use of such discourse; the way in which securitization is institutionalized; and its impacts on the decision-making process" (Fischhendler, 2015).

While water security is context specific and interpreted widely, it is possible to discern from the international literature three discourses that loosely reflect different disciplinary lenses. First is the *water engineering discourse,* which responds to fear of scarcity with supply-side measures (Gerlak et al., 2018). This dominant framing of water security is embedded within the 'hydraulic mission' of technocratic water agencies (Molle et al., 2009) and is commonly expressed in calls to 'drought proof' an industry, region, city or nation (Williams, 2019). Such thinking is intertwined with concerns about the nexus of water, food and energy security, which are increasingly used to justify interventions like large-scale infrastructure, land and water grabbing, and other 'climate proofing' projects and policies (Mehta et al., 2012; Allouche et al., 2019).

Second is the neoliberal *water economics discourse*, which reinforces the commodification, marketisation and sometimes privatisation of water and water services. This discourse frames water security as a matter of ensuring reliable flows of water and capital to purported 'higher value uses' and reflects the broader global trend towards neoliberalisation and financialisation of nature and natural resources (Sullivan, 2013). Under the logics of this discourse, policy objectives shift away from securing water per se towards securing the water market (Budds, 2020) in ways that supplant state-oriented development goals with borderless financial objectives that are focused on the resilience of business activities that water supports (Schmidt and Matthews, 2018).

The third variant is the *socio-ecological discourse*, with its many permutations that stem from ecological and social science, Indigenous scholarship and activism, and place-based struggles. This discourse emphasises the multiplicity of water and its values and benefits, expanding the meanings of security to encompass people and other living things (Tickner et al., 2017). This discourse frequently challenges asocial and apolitical readings of water security, instead acknowledging multiple needs, values, viewpoints and framings of water, and advocating for environmental and cultural flows (for example, Magdaleno, 2018; Tickner et al., 2020).

Droughts elevate water security debates and – as we illustrate in this paper – the multiple discourses associated with it become more contested. We turn now to a discussion of these discourses in the Australian context during the Millennium Drought – a period of rapid evolution in hydrosocial relations. We begin by describing the historical importance of drought in shaping the nation's identity.

THE MILLENNIUM DROUGHT AND THE EMERGENCE OF COMPETING WATER SECURITY DISCOURSES IN THE MDB

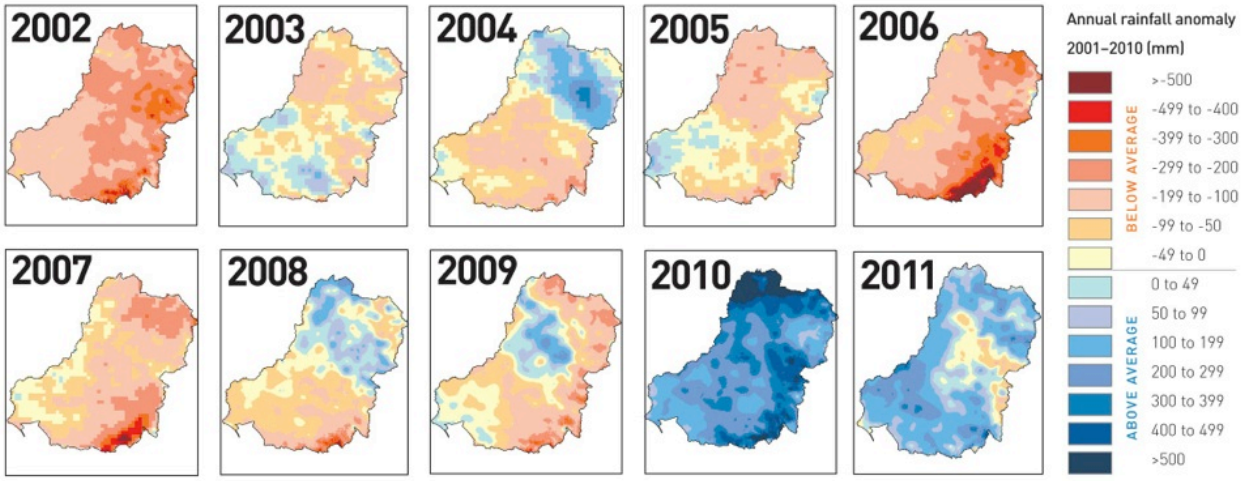
Drought and Australia's settler-colonial identity

Climate science explains that the continent's recurrent drought – flood oscillations are caused by fluctuating conditions in the surrounding oceans and their influence on rain-bearing weather systems (CSIRO, 2012; Kiem and Verdon-Kidd, 2013). While such systems are changing in complex ways under climate change – altering long-term trends and variability – Australia's 'climate normal' (Hulme et al., 2008) is still typically defined with reference to an instrumental record of approximately 125 years (CSIRO, 2012). Decadal droughts are prominent in this – and in the pre-instrumental – record (Gallant and Gergis, 2011; Gergis et al., 2012), yet meteorological droughts are identified as 'anomalous' periods of low rainfall relative to the statistical averages derived from the instrumental record (Figure 2).

Droughts, however, are far more than the climate statistics that are used to define them. Culturally and politically powerful, droughts have helped shape Australia's settler-colonial identity (Hayman and Rickards, 2013), albeit in contradictory ways. On the one hand, for non-Indigenous Australians droughts are valorised as a source of national pride, memorialised in a famous poem entitled *My Country* (Mackellar, 1908) that favourably contrasts Australia as a "land of drought and flooding rain" relative to Britain's (once) stable climate. This perspective implies that Australians are distinctively tenacious as proven by how they thrive in such a harsh environment (Rickards et al., 2017). On the other hand,

droughts are "creeping disasters" (Lake, 2008) and "slow catastrophes" (Jones, 2017) that cause widespread suffering and hardship.

Figure 2. Annual rainfall anomalies during the Millennium Drought, 2002-2010.



Source: MDBA (2011).

Many official documents imply that Australia is a desiccated and deficient place that requires drought-proofing (Arthur, 2003). Cathcart (2009) traces these attitudes to the time of British penal settlements when governors, convicts and marines who were steeped in Britain's moisture experienced the country as dry and hostile; for them this was a cultural shock that led to obsessive "water dreaming". According to Howden et al. (2014) and Gergis (2018), droughts threatened the survival of early British settlements. The threats, however, were more than climatic. During the Frontier Wars, colonial settlements were under attack from Indigenous warriors (Connor, 2002) [2] who were resisting colonisers' efforts to dispossess them of their territorial lands and waters. During dry periods, "guerrilla fighters" skilfully used fire to destroy crops and settlements, successfully disrupting squatters' attempts to occupy the land (Kerkhove, 2015).[3] These events embedded a deep fear of drought conditions in the settler-Australian psyche.

For the Indigenous people of the MDB, the consequences of their loss of access to ancestral territories were exacerbated by droughts (Abel et al., 2006) after governments granted farmers and pastoralists the legal rights to the vast majority of land and water resources (Hartwig et al., 2020). Governments also supported settler occupation with subsidies and natural disaster funding during recurrent drought periods (Commonwealth, 1990; Howden et al., 2014). Drought subsidies thus helped secure the colonial occupation against a variable climate, supporting agricultural and pastoral pursuits in climatically and economically marginal regions. In the 20th century, these subsidies became deeply normalised, even as their impacts and rationale became more heavily questioned (Commonwealth, 1990). These historical processes established the enduring settler-colonial regimes that enabled the territorialisation of the continent's lands and waters. The resultant development patterns – centred on natural resource exploitation – underpin many of the policy dilemmas in the MDB.

[2] Connor (2002) defines these wars as extending from 1788 to 1938.
[3] Squatters were British settlers who 'squatted' on vast areas beyond the official boundaries of the colonial settlements in order to graze sheep and cattle; many were engaged in the violent dispossession of Indigenous people (Connor, 2002).

The Millennium Drought and water security

The Millennium Drought stimulated intense debate about drought and water policies. As the drought persisted through the last years of the 20th century and into the new millennium (Figure 2), different groups drew on pre-existing discourses to promote their agendas about water security (Wentworth Group of Concerned Scientists, 2002; Bell and Moller, 2006; Vanclay, 2010). These discourses – which we define as drought-proofing, highest value use, and river restoration – are Australian variants of the discourses outlined above. Each discourse influenced the trajectories of the reforms to Australia's fragmented water governance, shaping the country's first national water legislation (Commonwealth, 2007) and the programmes implementing it (Grafton, 2019). In the following sections, we describe each discourse and interpret its history, effects and influence on water policy.

Water security 1: The 'river restoration' discourse

During the Millennium Drought, a great sense of foreboding extended from rural areas to the capital cities. Vast areas of floodplain forests died and the acidification of the Murray's Ramsar-listed Lower Lakes became an ecological crisis that gained international attention (Kingsford et al., 2009). The scale of the ecological damage was taken as a sign of the insecurity of Australia's water resources and the vulnerability of the entire MDB, triggering a wake-up call for the nation about water management. Improving water security by restoring environmental flows – and thereby nurturing river systems' life-giving, water-generating capacity – became central to calls for reform (Wentworth Group of Concerned Scientists, 2002).

This discourse in Australia originated in the 1980s, when environmental NGOs and civil society groups – including the Snowy River Alliance, the Inland Rivers Network, and the Australian Conservation Foundation – began actively promoting environmental flows (Johnson and Rix, 1993; Alexandra and Fisher, 1995; Watson, 2005). Australian academics also began publishing on the ecological impacts of river regulation (for example, Walker, 1985; Day, 1989). The Snowy River Alliance, which pursued Australia's first major campaign on returning flows (Watson, 2005), emerged out of communities that were angered at the Snowy Scheme. This grand nation-building endeavour diverted the waters of the Snowy River inland to the MDB, and deprived downstream communities of up to 99% of the river's flow (Erskine et al., 1999). The environmental flow campaigns marked an inflexion point in the nation's water policy, with public interest claimants calling for the rebalancing of extractive and environmental water use, recognition of Indigenous interests, and the needs of iconic rivers and of their native fish such as Murray Cod (Alexandra and Fisher, 1995).

In 1991, public attention turned to the precarious condition of Australia's rivers because of a toxic freshwater algal bloom on a thousand kilometres of the Darling River (Johnson and Rix, 1993). This blue-green algal bloom that amplified concerns about river health coincided with a major conference on environmental flows (Pigram and Hooper, 1992) and with a national inquiry into water sector reforms (Industry Commission, 1992). Formalising environmental flows was one of the key goals of a 1994 intergovernmental agreement on water reforms (COAG, 1994). Governments' commitments to environmental flows helped institutionalise the natural flows paradigm (Poff et al., 1997), which argues that the closer a river is to its 'natural' or 'undisturbed' flow regime, the healthier it will be. While a complete return to natural flows is impossible for highly regulated rivers, under this paradigm, flow planning should aim to mimic natural flows as closely as possible.

In addition to opposition from industries that depend on water extraction, the natural-flows approach to healthy rivers faced (and continues to face) inherent challenges. First, it relies on an imaginary of rivers without people. This essentialist naturalism is an ecohydrological equivalent of wilderness that reinforces the myth of terra nullius, yet Australian rivers, wetlands and catchments co-evolved with Indigenous people over millennia and are therefore nature – culture hybrids (Taylor et al., 2017). Awareness of this is catalysing calls for greater recognition of Indigenous peoples' rights to participate in governing water

and waterways (Taylor et al., 2017; Hartwig et al., 2020). The second challenge is that, in practice, the natural-flows approach relies on modelling natural flow benchmarks and contrasting these with current flow regimes, using techniques that often render water-policy decisions technical and apolitical (Allouche et al., 2019), thus obscuring the complex value choices and socially determined objectives involved (Bouleau, 2014). Third, a rapidly changing climate challenges the validity of 'natural' flow ideals, raising questions about whether ecological restoration is appropriate or feasible under Anthropocene conditions (Ross et al., 2015).

Advocacy for environmental flows increased during the Millennium Drought as severe ecological stress became evident throughout the Basin and concerns about river health intensified (Wentworth Group of Concerned Scientists, 2002; Kingsford et al., 2009). The Wentworth Group of Concerned Scientists was formed in response to fears that drought-proofing initiatives would unleash a new wave of dam construction (Vanclay, 2010). The Group argued that the nation must learn to live within the continent's climatic constraints instead of attempting to "engineer away drought". It recommended establishing a natural resource commission and adopting a new national plan for "improving the health of our damaged rivers, protecting our remaining healthy rivers and improving water-use efficiency across Australia" (Wentworth Group of Concerned Scientists, 2002).

Healthy rivers and water-use efficiency were discursive constructions with political appeal. In 2004, Australia's governments agreed to a new National Water Initiative and the Commonwealth established a National Water Commission to oversee water reforms (Connell, 2007). However, as the drought progressed, its visceral impacts intensified frustration about the slow pace of implementation of water reforms, and pressure for political action mounted (Bell and Moller, 2006). An unprecedented window of opportunity for Commonwealth intervention opened, and it used the drought-induced water crisis to wrest a significant degree of control of the MDB from the states (Wanna, 2007). Responding to the impact of the drought "on struggling farmers, proud gardeners and a thirsty landscape", Prime Minister Howard (2007) announced an ambitious National Plan for Water Security, asserting that the crisis proved the failure of cooperative federalism and "that the old way of managing the Murray-Darling Basin has reached its use-by date". The Commonwealth legislated for greater control over the MDB through the Water Act (Commonwealth, 2007); it justified its interventions on the basis of the nation's international treaty obligations under the Ramsar Convention on Wetlands and the Biodiversity Convention (Wanna, 2007).[4]

The Water Act's objectives included restoring the Basin's water-dependent ecosystems through formalising environmental flows and reducing extractive water use. Determining the difference between natural and post-development flows became the conceptual basis of the modelling used for the new Murray-Darling Basin Plan, and increasing environmental flows became the primary policy prescription (Commonwealth, 2012; Alexandra, 2020).

These changes were pursued under the policy slogan of 'healthy working rivers' – a discursive construction that encapsulates the grand ambition of balanced policy decisions. Difficult to pin down, the deliberately ambiguous notion of healthy working rivers wove together the river restoration discourse with the one we now turn to, highest value use.

Water security 2: The 'highest value use' discourse

The slogan 'healthy working rivers' moderated the river restoration discourse to appeal to a broader constituency. Underpinned by a classical economics assumption that humans and nature are separate realms, it reflects a supposed trade-off and compromise between the needs of nature and those of humans. These concepts were neatly summarised by Prime Minister Howard's (2007) appeal that "we

[4] Under Australia's constitution, states retain legal power over land and water, but the Commonwealth has international responsibilities, including international treaty obligations. Ironically, the Howard government had frequently stated its opposition to international treaties.

must strike a sustainable balance between the demands of agriculture, industry and towns on the one hand and the needs of the environment on the other".

Industry needs are the most prominent in the second variant of water security: the idea of redistributing water through markets to its highest value uses. The logic at work in this discourse is that enabling market-based water flows secures capital flows, which in turn secures economic growth. It reflects the realignment of Australia's policy and governance models along neoliberal, market-based lines (McCarthy and Prudham, 2004; Curran and Hollander, 2002) and the financialisation of natural resources (Sullivan, 2013; Allouche et al., 2019).

Like river restoration, the highest value use discourse originated in changes that were underway before the Millennium Drought. In the early 1990s, a discourse coalition (Hajer, 2005) of the government's economic agencies and environmental advocates emerged, which was intent on modernising natural resource policies (Johnson and Rix, 1993). Pressure for water sector reform increased due to poor financial management, the cost of replacing ageing infrastructure, and degraded rivers (Industry Commission, 1992). In 1994, all Australian governments committed to full cost recovery, to ending subsidies for water infrastructure, and to reforms enabling water markets and environmental flows (COAG, 1994, 1995). The Commonwealth also proposed substantive reforms to drought policy that would end inefficient subsidies and ensure that farm businesses assumed greater responsibility for risk management (Commonwealth, 1990; Howden et al., 2014). These reforms were part of Australia's microeconomic reform agenda, known as the National Competition Policy, which was largely neoliberal in its logic and prescriptions (Curran and Hollander, 2002). Australia's reform agreements optimistically proclaimed that they provided the policy architecture for modernising water and agricultural policies and achieving ecological sustainability and economic accountability; however, they were open to widely different interpretations due to their hybridisation of neoliberalism and sustainable development (Edwards, 2015; Alexandra, 2018; Baldwin et al., 2019).

In the early 1990s, irrigator groups lobbied for legally secure water 'property rights' and greater resource security in response to campaigns for increased environmental flows (Johnson and Rix, 1993; Marshall and Alexandra, 2016). In the Council of Australian Governments (COAG) agreement, governments made commitments to making water entitlements transferable 'property rights' (COAG, 1994, 1995) and subsequently agreed to provide compensation for any entitlements that were reallocated to meet environmental goals (COAG, 2004). Far-reaching water market reforms in the late 1990s and early 2000s securitised water entitlements (COAG, 1995; Grafton et al., 2011; Rankin, 2012).[5] These reforms altered the foundational premise of Australia's water laws, which – since the introduction of the 1886 Victorian Irrigation Act by Alfred Deakin[6] – had enshrined state control over all freshwater to avoid it being captured by vested interests (Brett, 2017; Rankin, 2012).

Enabling water markets became a key tenet of Australia's water reforms and was one of the policy mechanisms used for transferring water resources between irrigation and the environment (Marshall and Alexandra, 2016; Grafton, 2019). During the Millennium Drought, water markets were also identified as being promising climate adaptation instruments, given their responsiveness to variable climatic conditions and their ability to ensure the productivity and survival of high value, permanent horticultural and viticulture crops during periods of low water availability (Connor et al., 2009).

Water markets are intended to redistribute water resources to those with more purchasing power (Budds, 2004), with the view that this purchasing power reflects the value of their activities. Markets are agnostic to users. Given the intentional flexibility of market-based allocations, high value users can include mining, manufacturing and electricity production. However, in Australia, where agriculture is increasingly financialised, those with the greatest water-purchasing power are generally larger farmers

[5] Asset securitisation is the process of converting a pool of illiquid assets into tradable securities, as occurred with the conversion of water entitlements that were affixed to land titles into tradable entitlements.

[6] Deakin later became premier, prime minister, and one of the founders of the Australian Federation (Brett, 2017).

and agribusiness corporations (Wheeler et al., 2020). In the MDB, this power is illustrated by the growth in cotton and almond production, which is fuelled by international financial and commodity markets (Mallawaarachchi et al., 2020). Shifting significant water decisions from state control into a regime of market exchange has, however, resulted in severe consequences for rivers and communities (Jackson and Head, 2020).

As the drought wore on, water scarcity and the plight of many rural communities became increasingly severe (Rickards, 2012). Those promoting drought-proofing ideals made the plight of farmers more visible and nationally prominent (Bell and Moller, 2006), as we discuss below.

Water security 3: The 'drought-proofing' discourse

The Millennium Drought strongly revitalised the supply-oriented discourse of drought-proofing, despite several decades of water policy reform that had been intended to increase the efficiency and sustainability of water governance (Crase et al., 2009). As with the other two variants of water security, this discourse also had a pre-drought history. Indeed, as indicated above, experiences and consequent fear of drought had stimulated 'water dreaming' since early colonial settlement. Williams (2019) argues that the myth of drought-proofing is "burned into the Australian psyche" and that each drought reanimates grandiose engineering proposals to conquer the continent's aridity.

The political resonance of the drought-proofing discourse reflected its established position as Australia's dominant water security model. Governments had used irrigation development to pursue national ideals of inland settlement, economic self-sufficiency and triumph over a treacherous, unreliable climate (Gibbs, 2009; Lines, 1994, Strange and Bashford, 2008). Throughout the 20th century, successive governments had mobilised state powers to "make the deserts bloom", leading to the damming of most rivers in the MDB (Figure 3).[7]

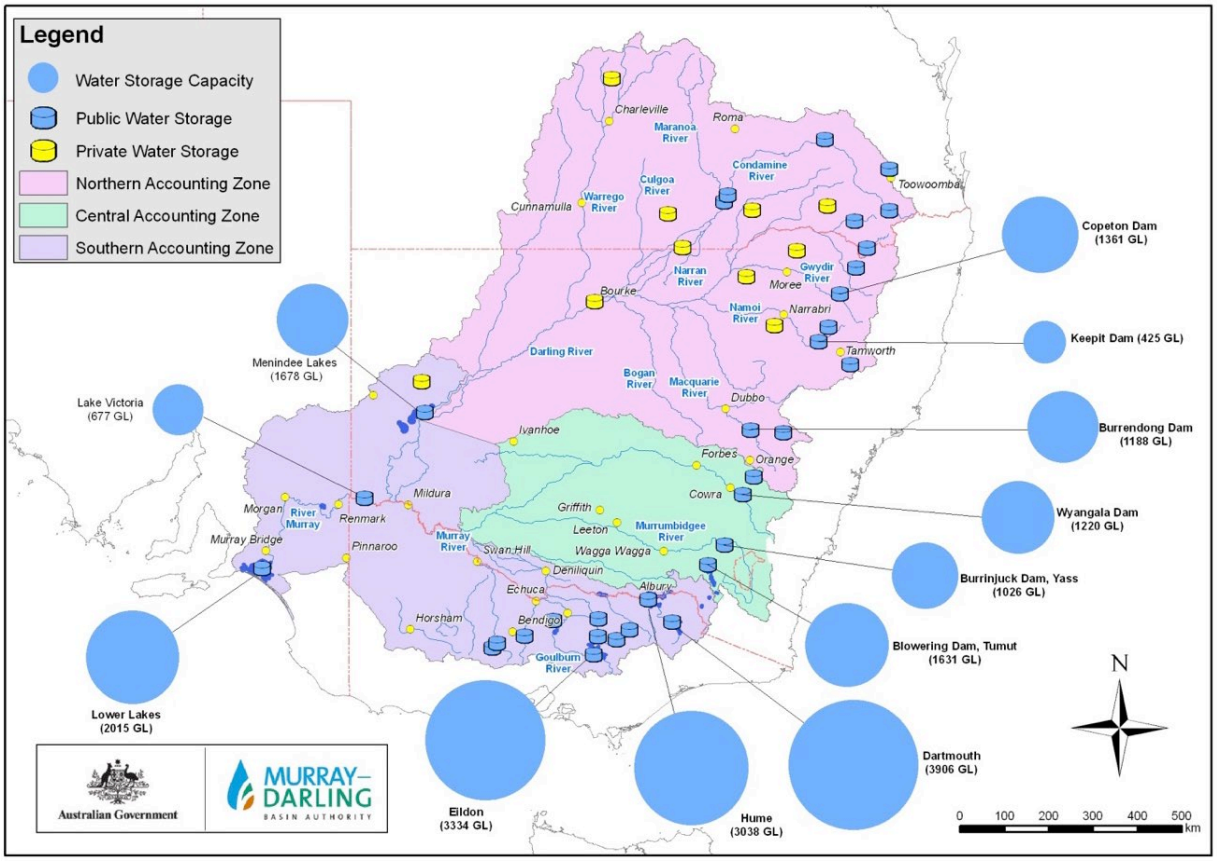
Ambitious irrigation schemes and other heroic nation-building water infrastructure combined large-scale physical and social engineering (Mercer et al., 2007; Berry and Jackson, 2018). After World War I, governments sponsored soldier settlement schemes that subsidised thousands of former servicemen to farm small irrigation blocks (Fry, 1985). Motivated by flawed agrarian visions and the ruling elites' fear of an armed, socialist revolution, these schemes dispersed returned soldiers from the cities (ibid). The schemes resulted in extreme hardship and the economic failure of thousands of farms (and are arguably partially responsible for the widespread hardship of many debt-ridden farmers during the Millennium Drought); this reinforced the framing of farmers as 'Aussie battlers' toughing it out in the bush and deserving of large-scale government protection (Watson, 2014).[8]

Examples of the political will to protect farmers were visible during the Millennium Drought, during which many farming families and rural communities suffered from the compounding stresses of high temperatures and heatwaves, severe storms, large wildfires, and changes in the seasonality of rainfall (Rickards, 2012). Despite successive reviews recommending the end of inefficient subsidies (Commonwealth, 1990; Howden et al., 2014), after the exceedingly dry year of 2006 when social hardship became especially apparent, Prime Minister Howard offered drought-affected irrigators 'Exceptional Circumstances Relief Payments' and urged "Australians to pray for rain as hard-hit agricultural regions face zero water allocations" (The Age, 2007). The Howard government's responses to drought continued a long history of mutuality between farmers and governments and agrarianism or "country mindedness" alongside neoliberalism (Cockfield and Botterill, 2012).

[7] See Davidson's (1969) critique of irrigation expansion and Taylor's (1940) warnings that the continent's aridity would drive the population to coastal regions; see also Strange and Bashford (2008).

[8] *The bush* is the generic name given to rural areas beyond the cities (Watson, 2014).

Figure 3. Map of Murray-Darling Basin with major water storages.



Source: MDBA (n.d.).

Although the soldier settlement schemes mentioned above were generally failures (Fry 1985), irrigation eventually supported relatively reliable and valuable agricultural production in the MDB. Its beneficiaries promoted the virtues of using government funds, power and capabilities to expand. Securing further government commitments to new dams and developing certain regions at the taxpayers' expense (despite questionable economic benefits) became politically entrenched as a kind of 'cargo cult' (Davidson, 1969). Governments provided organisational and physical infrastructure and irrigators shared a common nation-building purpose with the states' water resource agencies. An unstated social compact was consummated, with governments providing the irrigation systems while farmers advanced the national interest by producing exportable commodities (Connell, 2007). The shared dependence of irrigators on governments strengthened their sense of group identity and their political influence as lobbyists (Marshall and Alexandra, 2016; Grafton and Williams, 2019).

Pro-irrigation lobbying intensified in 2002 when high-profile businesspeople formed the Farmhand Foundation in order to campaign for the victims of "a major national crisis brought about by drought" (Sydney Morning Herald, 2002). This well-orchestrated campaign saturated the media with the established narratives of the drought-proofing discourse, advocating that the worst drought in 100 years demanded government attention (Sydney Morning Herald, 2002). Calls for urgent government action were accompanied by confronting images of desperate, drought-affected farming families in barren, dusty paddocks (Bell and Moller, 2006), which many farm families found extremely aggravating and humiliating (Rickards, 2008).

The Farmhand Foundation campaign resurrected the Bradfield Scheme to divert coastal rivers inland, an ambitious plan that had been first proposed in the 1930s. There were calls for major water infrastructure programmes to be funded from the complete privatisation of the nation's telecommunications company, Telstra, a sale consistent with the government's neoliberal agenda (Gratton, 2002).[9] Prominent radio commentator Alan Jones called for AUD $10 billion from the Telstra sale "to water Australia", and promised to "continue to pursue that matter with the Prime Minister of watering Australia with Telstra money" (ABC, 2002; Sydney Morning Herald, 2002). Critical commentators argued that the campaign's purpose was simply a way to 'buy' rural politicians' votes to support Telstra's privatisation, and that is was not motivated by any genuine concern for farmers (Gratton, 2002).

The idea of watering Australia with Telstra money neatly encapsulated the campaign's drought-proofing proposals. These skilfully linked together two networked infrastructures historically provided by governments at a time when the privatisation of Australia's state-owned enterprises was already well advanced (Abbott and Cohen, 2014). While the private sector coveted Telstra as a strategic business asset for the digital age, the campaign portrayed drought-proofing as a pressing government responsibility.

The Farmhand Foundation campaign revitalised the nations drought-proofing ambitions (Gratton, 2002) and appears to be the proximate origin of Howard's Plan for Water Security. The truth, however, may never be revealed and it therefore remains a matter of speculation as to whether the Farmhand campaign directly inspired the AUD $10 billion commitment or if it arose from a political deal struck about Telstra's privatisation. Regardless of the Plan's origins, the government 'rained' money on the bush – or more precisely on irrigation businesses in the MDB – which by 2019 had each received, on average, infrastructure subsidies worth AUD $400,000 (Grafton and Williams, 2019).

The AUD $10 billion Water Security Plan avoided cabinet and parliamentary scrutiny by using the proceeds of the Telstra privatisation, which were held in a special-purpose financial vehicle called the Natural Heritage Trust.[10] Australia's Treasury Secretary, Ken Henry, lambasted the move, arguing that it set a dangerous precedent by eroding parliamentary oversight of significant policy decisions (Australian Parliament, 2007). To strengthen its limited constitutional powers and minimise the risk of legal challenges, the Commonwealth offered states significant 'bribes' to refurbish their irrigation infrastructure (Wanna, 2007). This funding contradicted the COAG agreement on ending subsidies (COAG, 1994), but there was no opposition because reducing water wastage had become an accepted social norm due to the widespread urban water restrictions necessitated by the drought conditions (Head and Muir, 2007; Crase et al., 2009).

The Millennium Drought also heightened concerns about climate change among Australia's urbanised population. Instead of a future threat, climate change impacts were made tangible by restrictions on household water use (Tranter, 2015). At national elections, Australians voted in a new Labor Government in what *The Guardian* (Glover, 2007) claimed was the world's first climate change election. It argued that, after a decade of Howard pouring "scorn on the idea of global warming", "the trees are dying, the crops are failing and the rivers are drying up" (Glover, 2007). The Howard government had endured more than a decade of drought, but the AUD $10 billion Plan had failed to restore the population's faith in their leadership. Climatic events proved to be powerful actors in the nation's affairs.

In opposition, Labor had criticised Howard's Water Security Plan as profligate and undisciplined spending (Australian Parliament, 2007); however, once in government, they rebadged the programme 'Water for the Future' and increased the budget to AUD $13.4 billion, with about two-thirds allocated to irrigation efficiency measures and one-third to purchasing entitlements for environmental water (Grafton, 2019). These programmes and the Water Act reforms were pitched to the public as bold

[9] Telstra is Australia's national telecommunications company. Initially a publicly owned government enterprise, it was first partially, and then fully, privatised.

[10] Using the proceeds of Telstra's privatisation, the Commonwealth established the Natural Heritage Trust to fund environmental initiatives.

initiatives directed towards fixing big problems, with both the definitions of the problems and their solutions becoming accepted as 'statutory facts' (Beasley, 2021).

Discursive dynamics during and after the drought

The Millennium Drought ended abruptly with widespread, damaging flooding in 2010/11; however, the governance and policy changes initiated during the drought have left a lasting legacy. They remain heavily contested and controversial, with many deficiencies exposed through numerous official inquiries and critical research (Grafton and Williams, 2019; Grafton et al., 2020; Beasley, 2021; Colloff et al., 2021).

Overall, policy responses to the Millennium Drought reinforced and legitimised three existing, overlapping, but competing goals: restoring riverine ecosystems through environmental flows, increasing water efficiency and transfers through markets, and increasing supply security for agriculture. Howard's 2007 National Plan for Water Security wove together these competing objectives, using policy mechanisms such as markets and infrastructure to serve contrasting agendas. However, the water governance reforms not only integrated these objectives; they altered the relative priority afforded to them, shifting the trajectory of Australia's water policies. Before the drought, the COAG reforms of 1994 had aimed to increase economic and ecological accountability, reduce industry assistance, and impose user-pays policies on water users. The inconsistencies between earlier policy commitments (COAG, 1994, 2004) and those that were actually delivered gained limited attention. During the drought, rural hardship, sophisticated campaigns, and political opportunism undermined these policy goals. The Commonwealth expended many billions of dollars on reconfiguring irrigation systems (Crase et al., 2009; Grafton, 2019) and on farm household welfare and business support (Cockfield and Botterill, 2012). In these ways, governments revitalised and prioritised the drought-proofing ideals that were rooted in the long, deep path of settler-colonial history and in 20th century developmentalism that had established inland settlements dependent on water-intensive agricultural systems.

The length and conditions of the drought provided multiple opportunities for policy manoeuvring and for the layering of contradictory approaches. Water scarcity added pressure on governments; it increased water agencies' reputational risks, challenged their core competencies in ensuring reliable water supplies, and justified political interventions. With elected governments held accountable for the political risks of water system failures, drought conditions offered opportunities to gain increased funding for supply augmentation projects at times when the usual economic discipline about project cost-effectiveness were bypassed (Productivity Commission, 2011). Drought responses demonstrated a renewed enthusiasm for supply-side engineering that could provide "concrete solutions" to water scarcity (Crase et al., 2009). Most state governments commissioned desalination plants to 'climate proof' metropolitan water supplies (Elmahdi and Hardy, 2015). Ferguson (2014) estimates their combined life-cycle costs to be between AUD $25 and $32 billion. Urban water users will pay for these energy-intensive installations through higher user charges, raising concerns about efficiency and equity (Productivity Commission, 2011; Pittock et al., 2013).

The drought did not trigger a new wave of large dam construction, as had been repeatedly proposed, because most of the Basins' rivers were already dammed (Figure 3); however, the Commonwealth committed many billions of dollars to irrigation infrastructure refurbishment, despite previous commitments to phase out subsidies and introduce user-pays regimes (COAG, 1994, 2004). The subsidies for rebuilding or reconfiguring irrigation systems resulted from successful rent-seeking by irrigators (and their lobbyists), who promoted politically opportune schemes (Crase et al., 2009).

The scale of the subsidies is significant and indicates that the underlying purpose of the funding programmes was to subsidise irrigation. The AUD $13.4 billion allocated by the Commonwealth is roughly equal to the capital value of 80% of all water entitlements in the MDB when valued using water market

prices (Productivity Commission, 2017).[11] Through direct purchases and efficiency measures, the Commonwealth has acquired approximately 20% of MDB water entitlements for environmental uses. However, actual gains to the environment may be illusionary, because the claimed water savings generated from efficiency measures may be dubious (Grafton and Wheeler, 2018) and some of the entitlements purchased by the government are low security, 'sub-prime assets', which will yield little actual water (Moore et al., 2020). Also, Wheeler et al. (2020) document a significant rebound effect, finding that many irrigators who received efficiency subsidies increased total water use. Given the serious doubts about the efficacy of entitlement buybacks (Moore et al., 2020) and efficiency measures (Grafton and Wheeler, 2018), there are risks that the Commonwealth's 'river of funding' only results in a "trickle of achievement" (Lee et al., 2009). While the government has become the 'proprietor' of the nation's largest portfolio of entitlements (holding approximately 20% of all MDB entitlements for environmental uses), flows in rivers have not increased proportionately (Grafton and Wheeler, 2018; Wentworth Group of Concerned Scientists 2020). There are significant concerns about the probity, legality and effectiveness of the MDB reforms (Grafton and Williams, 2019; Grafton et al., 2020; Beasley, 2021); nevertheless, the government repeatedly dismisses proposals for a comprehensive water audit to assess the impacts of the water reform programmes (Grafton, 2019; Grafton et al., 2020).

Overall, raining money on the water problems has not reduced the fundamental tensions, and MDB policies remain highly conflicted, with waning confidence in the reform outcomes (Grafton and Wheeler, 2018; Alexandra, 2019; Grafton and Williams, 2019). Also with a drying climate, the prospects of successfully restoring the Basin's riverine ecosystems are receding (Alexandra, 2020).

These problems were highlighted between 2017 and 2020, when the MDB experienced another intense drought. Again, this drought was defined as an unprecedented crisis that required urgent political action. Governments again offered prayers and financial subsidies to assist farmers, and again drought responses demonstrated the resilience of the drought-proofing ideals, with many prominent calls for the construction of more irrigation dams. This drought also demonstrated the political nature and impacts of water allocation policies that preferentially distributed water to irrigation while marginalising other interests, including downstream communities (Jackson and Head, 2020). Persistent problems stem from how the securitisation of water entitlements increased resource security for those with entitlements (or the money to buy them), but decreased security for others, including many small communities. The reforms exacerbated power imbalances, reinforced historical patterns of resource ownership, and further marginalised Indigenous peoples in the MDB (Hartwig et al., 2018; Hartwig et al., 2020).

These enduring issues affect the MDB and its governance. A substantive unfinished reform agenda is emerging around issues of water justice, including recognising Indigenous water rights, and citizens' democratic rights to greater involvement in water governance. Growing concerns about the efficacy and equity of Australia's water reforms are stimulating fundamental questions about the kinds of democratic institutions needed to effectively manage the nation's waters in a changing climate (Alexandra, 2019). Amnesia about Australia's policy settings and their history is hampering the capacity to address these concerns. Australia's government suffers from institutional amnesia, eroding its ability to understand the context and rationale of previous policy decisions (Tingle, 2015). This institutional memory loss contributes to the regulatory capture plaguing Australia's water governance (Grafton and Williams, 2019) and distracts attention from repeated reform failures (Connell, 2014; Grafton et al., 2020). Reforms to institutional structures and processes for accountability are therefore required (Alexandra, 2019), as is more critical, longer-term analyses of MDB reforms.

[11] The Productivity Commission's (2017) estimate of water entitlement values uses market prices at the time of the study. Entitlements would have been worth substantially less in 2007 when the government committed the funding, because the public funding of irrigation upgrades relieved irrigators of the cost of infrastructure refurbishment.

INSIGHTS FOR RESEARCH AND CLIMATE CHANGE ADAPTATION

This paper traces the historical origins of three discourses of water security – drought-proofing, highest value use, and river restoration – and describes their impacts and evolution during Australia's Millennium Drought. This drought was defined as an unprecedented national crisis, heightening fears about water insecurity and environmental degradation. Campaigns blending ambitious drought-proofing schemes with the privatisation of the nation's telecommunications system intensified contestation about water policies and revealed starkly different agendas, values and expectations of governments.

The analysis provided in this paper points to fundamental challenges for water governance under climate change. It demonstrates that climatic events can influence national affairs and illustrates the influence that these events can have on policy and society. With climate change, we should expect an increase in the political impacts of extreme climate events. Given that dominant discourses frame feasible policy options for dealing with these challenges, we wish to highlight three insights about drought, climate adaptation, and water governance.

First, during droughts, water security concerns become elevated in policy debates. Choices about policy responses, however, have important implications that extend beyond the scope of typical water policy considerations. During the Millennium Drought, crisis conditions were used to advance multiple non-water goals, including advancing the agenda of privatising public services and fundamentally altering some of the established structures, processes and principles of cooperative governance of the MDB. The upshot is that water policy becomes a powerful vehicle for promoting wide-ranging agendas during crisis periods like droughts. Policy statements that were carefully crafted for popular appeal, and, crucially, a degree of ambiguity and manoeuvrability, supported these agendas. They strategically and opportunistically repurposed existing discourses and implementation mechanisms, enabling fundamental shifts in policy directions. These statements drew on accepted disciplines and discursive elements for their legitimacy, providing an example of what Mollinga (2019) defines as political conditioning, that is, the process of selection, retention and consolidation that enables specific imaginaries and sets of meaning to become accepted as the logical basis of policies and thereby causal in society.

Second, the challenges droughts present for climate change adaptation stem from their policy and political effects, not only their physical, economic and social ones. Crises that are driven by extreme conditions can provide windows of opportunity for positive policy change and learning; however, outcomes depend on how such conditions are represented, managed and utilised, and on the actual changes instigated. In particular, droughts can increase concern about climate change, but crisis responses can generate path dependencies, with long-term implications for climate adaptation and water policy (Marshall and Alexandra, 2016). As the MDB case illustrates, incumbents can take advantage of crisis periods to consolidate their power and influence. Drought periods provide opportunities for advocates of heroic, hard engineering responses to water scarcity to promote their 'drought-proofing' schemes. There is risk that supply-side approaches to water security will be repeatedly revitalised as climate change progresses and droughts recur. Among the implications of this prospect are that the introduction of more systemic approaches requires policy development work *between* droughts. In addition, there is a need for more research into the social and political effects and agency of climatic extremes and the discursive legacies, power plays and path dependencies in play.

Third, the political discourse evident during the Millennium Drought, and during similar crisis periods, includes claims that the situation is exceptional and that new thinking is needed. This claim obscures the origins of the discursive resources that are reworked during such periods, reducing the capacity for critical scrutiny. Although climate change means that climatic extremes are changing in character and severity, it is crucial to recognise how policy responses generally draw on *existing* conceptual and discursive resources. If the historical origins of these discourses (for example, the drought-proofing discourse) are not recognised, then the capacity to understand and critically scrutinise them is reduced. As this paper

illustrates, policy responses deemed feasible and appropriate in a given context are historically, physically and politically conditioned through extended struggles that shape dominant discourses. These discourses co-evolve with 'natural' and technological water systems, long-term settlement patterns, institutions and governance regimes, social identities, and power relations. These factors in turn help determine whether a meteorological drought translates into a water scarcity crisis, with its attendant social and political problems.

CONCLUSIONS

Given that droughts and drought impacts are becoming more frequent and intense under climate change, we need more research into the hydrosocial relationships that determine how we handle climate-driven water crises. While reforms to policies and institutions will inevitably build on contemporary arrangements and their historical antecedents, this study illustrates that during contested reforms policy actors act strategically to set agendas, influence policies, and reinforce policy preferences. These discursive contestations are central to controlling water and other resources and to the processes of governing them.

In the complex political ecology of water, implicit and explicit arguments are mobilised to legitimise particular policies and strategies (Swyngedouw, 2009), while the impact of these arguments depends on realpolitik and on the asymmetric power imbalances involved in governing (Nightingale, 2017). In any water situation, complex sociopolitical relationships frame the legal, political, administrative and institutional control of water. Certain ideologies, imaginaries and sets of understanding become dominant, defining normative goals and legitimising policies (Schmidt, 2017; Mollinga, 2019). This paper illustrates how these sets of understandings do not just emerge; they are cultivated and reinforced, politically and economically. Critical social science research focusing on both the past *and* the future is more important than ever. For researchers interested in hydrosocial dynamics and climate change adaptation, this underlines the need to take a broad, long-term view of the changing physical, institutional and discursive contexts.

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