14 August 2016

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Hon Robert Brown LCM
General Purpose Standing Committee No 5
Parliament House
6 Macquarie Street
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By upload: www.parliament.nsw.gov.au

Dear Honourable Members,

UNSW LAW SOCIETY SUBMISSION TO THE INQUIRY INTO THE AUGMENTATION OF WATER SUPPLY FOR RURAL AND REGIONAL NEW SOUTH WALES

The University of New South Wales Law Society welcomes the opportunity to provide a submission to the Legislative Council inquiry into the augmentation of water supply for rural and regional New South Wales.

The UNSW Law Society is the representative body for all of the students in the UNSW Faculty of Law. Nationally, we are one of the most respected student-run law organisations, attracting sponsorship from prominent national and international firms. We seek to develop UNSW Law students academically, professionally and personally.

The UNSW Law Society is proud to celebrate a rich diversity of students with a multiplicity of aims, backgrounds and passions, including many students who have come from regional and rural NSW. As young Australians, we are concerned with the State's management of water resources and urge the government to make all decisions consistent with the principle of intergenerational equity.

The submission below reflects the varied opinions of the students of the UNSW Law Society. It addresses the following terms of reference:

(f) examine social, economic and environmental aspects of water management practices in New South Wales and international jurisdictions, including the following case studies:
  (i) Broken Hill town water supply/Menindee Lakes system …
(g) the efficiency and sustainability of environmental water being managed by different State and Federal Government departments and agencies
(h) the management, appropriateness, efficiency and reporting of: …
  (ii) conveyance and loss water

In respect of sub-paragraph (f)(i) of the terms of reference, the submission's key findings are that:

- the setting of the sustainable diversion limits should be made in line with the best available scientific knowledge in order to reduce water use to environmentally sustainable levels;

- long term environmental outcomes should be given precedence over short term socio-economic outcomes; and
- drawing from the example of the Senegal River Basin in West Africa, the government should favour an optimal 'uses-based' approach to water distribution, as opposed to volumetric withdrawals.

In respect of sub-paragraph (f) more generally, the submission's key findings are that:

- incentives are required to effectively encourage adoption of efficient and sustainable practices by individual households and local governments to establish an economy based on environmental sustainability; and
- an example drawn from Germany demonstrates how incentivising local governments and households can be used to alleviate the pressures on water supplies, along with promoting other environmental and economic benefits.

In respect of sub-paragraph (g) of the terms of reference, the submission's key findings are that:

- given the changes in water availability brought about by climate change, the preservation of a federal regime of water management is paramount; and
- an amendment of the *Australian Constitution* should be considered to give the Commonwealth legislative power to regulate water resources and to protect long-term, evidence-based environmental management from unilateral policy changes at a state level.

In respect of sub-paragraph (h)(ii) of the terms of reference, the submission's key findings are that:

- current criteria for determining critical human water needs are appropriate;
- current determinations of conveyance water loss are appropriate; and
- the three-tiered water sharing agreements and the dual reporting system are suitable to managing water resources in regional and rural New South Wales.

We thank you for considering our submission and should you require further information, please do not hesitate to contact us.

Yours faithfully,

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Term of Reference (f)

Examine social, economic and environmental aspects of water management practices in New South Wales and international jurisdictions, including the following case studies:

(i) Broken Hill town water supply/Menindee Lakes system …

I Menindee Lakes System Case Study

This case study will focus on the Menindee Lakes System and the current management practices, particularly the *Basin Plan* and whether it upholds the provisions of the *Water Act 2007* (Cth). It will also explain the principles of best practice water management in an international jurisdiction – the Senegal River basin in West Africa. We submit that the NSW government should adopt the principle of stronger and more effective collaboration with the Commonwealth government in managing water augmentation of the Menindee Lakes System.

For years, the Menindee Lakes System has been the source of water supplied to Broken Hill and other parts of the Darling and Murray Rivers.[1] At full capacity, the system is capable of storing over three times as much water as Sydney Harbour.[2] Over the last decade, both water quality and quantity has drastically declined causing a water shortage in Broken Hill.[3] This has largely been attributed to past mismanagement of the lake in an unsustainable manner leading to economic, social and environmental issues.[4]

A Current Management: The *Basin Plan*

The *Water Act* was drafted in an attempt to control water supply problems and improve the environmental conditions across the Murray-Darling Basin.[5] It includes the establishment of an 'independent expertise-based statutory agency', the Murray-Darling Basin Authority ('MDBA'),[6] to

1 Water NSW, *Menindee Lakes* (11 August 2015) <http://www.waternsw.com.au/supply/visit/menindee-lakes>.

2 Ibid.

3 Department of Primary Industries, 'Management Menindee Lakes 2015/16' (Community Information Communique No 19, NSW Government, 22 October 2015) 4–6 <http://www.water.nsw.gov.au/__data/assets/pdf_file/0003/581943/communique-19-management-of-menindee-lakes-2015-16.pdf>.

4 Aboriginal and Torres Strait Islander Social Justice Commissioner, *Native Title Report 2008*, Report No 2 (2009) 272.

5 *Water Act 2007* (Cth) s 3(c)–(e).

6 Murray-Darling Basin Authority, *About Us* (9 October 2015) <http://www.mdba.gov.au/about-us>; see *Water Act 2007* (Cth) pt 9.

facilitate the effective management of water resources. Under the Act, the MDBA's primary responsibility is to develop and implement an integrated water management system known as the *Basin Plan*.[7]

The integrated approach, supports collaboration between state and federal governments to place the management of the Murray-Darling Basin in a central authority to act in the 'national interest',[8] whilst ensuring the States retain their ownership of the land and their influence over the decisions being made. The *Basin Plan* is to give effect to the objectives of the *Water Act*. This raises questions regarding the extent to which the current *Basin Plan* is carrying out its objectives, particularly in two aspects:

1 In giving effect to the 'relevant international agreements'[9] Australia has ratified, specifically the *Convention on Wetlands of International Importance, Especially as Waterfowl Habitat* ('*Ramsar Convention*')[10] and the *Convention on Biological Diversity* ('*Biodiversity Convention*').[11]

2 In optimising the economic, social and environmental outcomes through the use and management of the Murray-Darling Basin.[12]

1 Giving Effect to International Conventions

The current *Basin Plan* fails to give full effect to Australia's international obligations under the *Ramsar* and *Biodiversity Conventions*, which promote the 'wise' usage of wetlands to preserve their ecological character,[13] and conservation of biological diversity through sustainable use of resources.[14]

The Murray-Darling Basin contains 16 of Australia's Ramsar-listed wetlands and its past mismanagement has compromised its biodiversity and resources. The *Water Act* and the *Basin Plan* adopted from it, implement the *Conventions* through management of the Murray-Darling Basin. The *Basin Plan* does this by setting 'sustainable diversion limits' ('SDLs') reductions, which decrease the

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7 *Water Act 2007* (Cth) pt 2 div 1.
8 *Water Act 2007* (Cth) s 3(a).
9 *Water Act 2007* (Cth) s 20(a).
10 Opened for signature 2 February 1971, 996 UNTS 245 (entered into force 21 December 1975). Regarding the status of Australia's ratification, see: at 246. Cf Department of Foreign Affairs and Trade (Cth), *Convention on Wetlands of International Importance Especially as Waterfowl Habitat* (5 June 2004) <http://www.info.dfat.gov.au/Info/Treaties/Treaties.nsf/AllDocIDs/8341AA6D907E9D3FCA256B48007CED70>.
11 Opened for signature 5 June 1992, 1760 UNTS 79 (entered into force 29 December 1993).
12 *Water Act 2007* (Cth) s 20(d).
13 *Ramsar Convention* art 3.
14 *Biodiversity Convention* art 1.

consumptive use of surface water, to be implemented in 2019.[15] The reductions are currently set at 2750 GL/year, with allowance for variation between 2100 and 3200 GL/year, and will be adjusted according to 'supply' and 'efficiency' measures.[16]

However, studies have shown that even the maximum reduction of 3200 GL/year is not sufficient to conserve the biodiversity and resources within the basin and allow for its sustainable development in a short or long term context.[17] Hence, the provisions of the *Water Act* in relation to giving effect to 'relevant international agreements' are not being satisfied as the *Basin Plan* does not fulfil the requirements established in the *Ramsar* and *Biodiversity Conventions*.

2 Optimisation of Economic, Social and Environmental Outcomes

The purpose of the *Basin Plan* is to reform management of the Murray-Darling Basin so as to reduce levels of water extraction to meet 'environmentally sustainable levels', whilst optimising social and economic outcomes.[18] Though it considers socio-economic outcomes, the primary focus of the *Water Act* remains reaching 'benchmark environmental outcomes' founded on 'best available scientific knowledge'.[19] These outcomes are not fixed and the Plan follows an adaptive management approach aiming to protect and restore water-dependent ecosystems to guarantee they can withstand climate change and other risks based on a scientific criteria.

However, the 'adjustment mechanism' included in the current plan restricts the range of the SDLs and goes against the scientific evidence provided, blocking the appropriate adoption of an adaptive management scheme. CSIRO's review of MDBA's modelling of the 2800 GL/year scenario concluded that it would fail to meet numerous 'specified hydrologic and ecological targets' which the MDBA has set.[20]

Furthermore, the implementation of a maximum reduction amount (3200 GL/year) will not be able to adapt where a greater reduction amount is needed to meet hydrologic and ecological needs.[21] A

15 *Basin Plan 2012* (Cth) ss 6.04, 6.05.
16 *Basin Plan 2012* (Cth) s 7.09 and Notes.
17 Emma Carmody, 'The Silence of the Plan: Will the Convention on Biological Diversity and the Ramsar Convention Be Implemented in the Murray-Darling Basin?' (2013) 30 *Environmental and Planning Law Journal* 56, 56, 72–3.
18 *Water Act 2007* (Cth) s 3.
19 *Water Act 2007* (Cth) s 21(4)(b); *Basin Plan 2012* (Cth) s 7(d).
20 Young WJ et al 'Science Review of the Estimation of an Environmentally Sustainable Level of Take for the Murray-Darling Basin' (Final Report, CSIRO, November 2011) 29–31.
21 Emma Carmody, 'The Silence of the Plan: Will the Convention on Biological Diversity and the Ramsar Convention Be Implemented in the Murray-Darling Basin?' (2013) 30 *Environmental and Planning Law Journal* 56, 58.

scientific report released by the MDBA also indicates that consumptive use needs to be reduced by between 3856 and 6983 GL/year for the restoration of the health of water-dependent ecosystems.[22] Thus the range from which the SDLs are to be determined is not in line with the 'best available scientific knowledge' and clearly does not meet the standards imposed by legislation as it is not capable of reducing water use to 'environmentally sustainable levels'.

Clearly, in the implementation of the *Basin Plan*, the MDBA is giving significant weight to the social and economic repercussions of reducing the extraction of water for consumptive use. It is also apparent that the social and economic growth of future generations is dependent upon sustainable management of present resources. The capping of the SDLs may lessen the socio-economic burden in the short term, but would cause great damage to the system in the long-run. Hence, policy considerations should be made to allow the shift to sustainable management in a socially and economically viable manner without limiting further sustainable development in the future.

3 Menindee Lakes System

Poor management of the Murray-Darling Basin plan in the form of an inadequate *Basin Plan* has led to critically low surface water levels in the Menindee Lakes System, which is now only being managed to meet local needs. The depletion and disruption of the water supply in the system has impacted the:

1 Economy, due to the number of farmer's dependent on the water supply for livelihood;[23]
2 Community, as the lakes are Broken Hill's primary water source and have cultural significance for local indigenous peoples;[24] and
3 Environment, as the disruption of the natural wetting and drying cycles of the lakes has impacted the range of flora and fauna.[25]

The NSW government is currently working with the MDBA on a short-term plan which involves sourcing water from shallow bores and a long-term plan to source water from deeper bores until there

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22 Murray Darling Basin Authority, *Guide to the Proposed Basin Plan* (2010) vol 2, 113–15.

23 Bill McCormick, 'Murray-Darling Basin Management' in *Briefing Book: Key Issues for the 44th Parliament* (Parliamentary Library, Parliament of Australia, 2013) 90 <http://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/BriefingBook44p/MurryDarlingBasin>.

24 Water NSW, *Sustainability and Cultural Heritage* (18 August 2015) <http://www.waternsw.com.au/projects/menindee/sustainability-and-cultural-heritage>.

25 Murray-Darling Basin Commission, 'Health of the River Murray: Menindee River Lakes, the Lower Darling River and the Darling Anabranch' (Information Paper No 10, 2004) 8–10<http://www.mdba.gov.au/sites/default/files/archived/mdbc-tlm-reports/525_menindeelakesdarling.pdf>.

is sufficient surface water supply.[26] These plans assume that effective planning and management of the Murray-Darling Basin will facilitate the eventual replenishment of overused water supplies. But this will only be possible when long-term environmental outcomes are given precedence over short-term socio-economic outcomes through the adjustment of the *Basin Plan*.

B A Prime Management Example: The Senegal River Basin

The Senegal River drainage basin stretches across four countries; Senegal, Mauritania, Mali and Guinea. The water obtained from the river a vital resource for energy, farming and human consumption given that drought, poverty and underdevelopment are widespread in these regions.[27] An investigation of Senegal River drainage basin management practices offers insights that can be applied to the Murray-Darling basin. Both river systems have large populations, spread across multiple jurisdictions, that are dependent on them for water supply.

In 1972 two Conventions were formed between the countries bordering the Senegal River drainage basin, to form the Senegal River Basin Development Organisation ('OMVS') to manage the Senegal Basin.[28] The *OMVS Convention* regulates the organisation's structure and clarifies important guidelines for the distribution of water rights amongst states and sectors and briefly touches upon aspects of dispute resolution.[29]

The *Senegal River Convention* facilitates the collaboration of member states to 'rationally exploit resources of the Senegal River' to provide food and economic security.[30] The Convention is not without flaws. For example, it permits changes to the characteristics of the River's flora and fauna, if all parties consent to the damage.[31] These deficiencies have been recognised and addressed by the

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26 Water NSW, 'Broken Hill and Menindee Water Security Project: Current Projects' (Fact Sheet, 18 June 2015) 2 <http://www.waternsw.com.au/__data/assets/pdf_file/0011/64793/Fact-Sheet-1-Current-projects.pdf>.

27 World Water Assessment Programme, *Water for People Water for Life: The United Nations World Water Development Report* (UNESCO, 2003) 450–61.

28 *Convention Concerning the Status of the Senegal River*, Guinea–Mali–Mauritania–Senegal, signed 11 March 1972 ('*Senegal River Convention*'); *Convention Establishing the Organization for the Development of the Senegal River*, Guinea–Mali–Mauritania–Senegal, signed 11 March 1972 ('*OMVS Convention*'). Guinea did not fully participate in the management of the basin until after the initial agreements were formed.

29 Amidou Garane and Teslim Abdul-Kareem, 'West Africa' in Flavia Rocha Loures and Alistair Rieu-Clarke (eds) *The UN Watercourses Convention in Force: Strengthening International Law for Transboundary Water Management* (Routledge, 2013) 97, 103.

30 Ibid 104.

31 Ibid.

Senegal River Waters Charter,[32] which considers environmental protection in more detail in determining the means by which water is to be collected and distributed.[33]

However, the distinguishing feature in the water management plan of the Senegal River is the allocation of water resources, based on 'uses as a function of possibilities', as opposed to volumetric withdrawals. Such uses include fish farming, livestock raising, hydroelectricity production, and so on. This is coupled with the establishment of a Permanent Water Commission ('PWC') to oversee that management decisions effectively use the water without harming the environment, and an Environmental Impact Alleviation and Follow-up Programme ('PASIE'),[34] which guarantees the population is able to safely benefit from the resources whilst trying to achieve sustainable development of the Basin. This demonstrates how a balance can be achieved in reaching economic and environmental outcomes.

In the over 30 years in which the OMVS has been active, it has proven to be effective as a collaborative management body of the Senegal Basin, as it has increased economic revenue and lifted water shortages.[35] This can be attributed to three key factors:

1 Effective collaboration between member nations;
2 Water distribution centred on 'optimal distribution to users' as opposed to volumetric withdrawals; and
3 Improving socio-economic outcomes without compromising sustainability of resources and environment through establishment of bodies such as PWC and PAISE.

We urge the government to further investigate and favour a 'uses-based' approach to water augmentation in regional and rural NSW. We believe that if similar propositions were to be adopted it would ensure sufficient water resources for the present and the future.

32 *Senegal River Waters Charter*, Mali–Mauritania–Senegal, signed 28 May 2002.
33 Amidou Garane and Teslim Abdul-Kareem, 'West Africa' in Flavia Rocha Loures and Alistair Rieu-Clarke (eds) *The UN Watercourses Convention in Force: Strengthening International Law for Transboundary Water Management* (Routledge, 2013) 97, 104.
34 World Water Assessment Programme, *Water for People Water for Life: The United Nations World Water Development Report* (UNESCO, 2003) 458–9.
35 Ibid 460.

II *Incentives and Water Augmentation*

A Introduction

The UNSW Law Society submits that incentives are required to effectively encourage adoption of efficient and sustainable practices by individual households and local governments. The effective application of government incentives to establish an economy based on environmental sustainability is arguably most readily seen in Germany. The example drawn from the German model demonstrates how incentivising local governments and households can be used to alleviate the pressures on water supplies, along with promoting other environmental and economic benefits.

B Declining Water Supply from Traditional Sources

With declining groundwater in Australia, innovative solutions for water augmentation are required to ensure adequate water supply for future decades. An international study released by NASA indicated worldwide declines in groundwater resources.[36] Australia is a very dry country and has increasingly relied on groundwater in recent years.[37] The Gravity Recovery and Climate Experiment ('GRACE') satellites used by NASA identified that almost all surface waters, such as lakes and rivers, were lost within the first two years of the Millennial Drought in Australia.[38] Even after the drought subsided, the GRACE data showed a continued decline in groundwater storage.[39] This evidence suggests that a significant response is required to overcome the challenges posed by declining groundwater supplies and now is the time for innovative solutions to deal with the decreasing groundwater supply.

C Existing Regulation

Current regulations, such as water restrictions mandatory rain water tanks, and water savings targets have all been used in an attempt to increase water supply.[40] The South Australian model required new housing developments after July 2006 to have rainwater tanks.[41] This requirement has meant that 46%

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36 Alexandra S. Richey, et al, 'Quantifying Renewable Groundwater Stress with GRACE' (2015) 51(7) *Water Resources Research* 5217.

37 Derek Eamus, 'Declining Groundwater Is a Big Problem for Australia' (online) 18 June 2015 <http://www.abc.net.au/news/2015-06-18/eamus-declining-groundwater-is-a-big-problem-for-australia/6556586>.

38 Ibid.

39 Ibid.

40 Sydney Water, *Water Restrictions* <http://www.sydneywater.com.au/SW/water-the-environment/what-we-re-doing/water-restrictions/>

41 Government of South Australia, *Building Code of Australia: Mandatory Plumbed Rainwater Tanks for Class 1 Buildings* (at June 2006)

of households in South Australia used water from a rainwater tank in 2013, which was the highest proportion of households across all Australian jurisdictions, though the requirement may simply be indicative of existing value placed on rainwater tanks by South Australian home owners.

By comparison, the figure rainwater tank use in NSW was 19%, which was better only than Western Australia and the Australian Capital Territory, despite seeing a great increase in the proportion using water tanks from 2007–13.[42] However, NSW regulations require new developments to meet a mains water saving target of 40% in line with the Building Sustainability Index ('BASIX') benchmarks.[43] This regulation is framed as a mandatory requirement for a rainwater tank but it offers some scope for innovation for other solutions.

D The German Model

The successful implementation of green roofs and water management in Germany is based on a comprehensive approach to the development of an environmentally sustainable economy.[44] By looking at the German model, the NSW government should take note of the following concepts: first, the need for environmentally sustainable procedures that stem from incentives directed at individual households; and second, the way that local councils are encouraged to experiment with solutions to environmental problems, including the need for water augmentation.

1 *Incentives for Households*

Creating a culture of sustainability means that environmental issues can be addressed readily at a localised level. Legal requirements can provide a foundation for community awareness of water usage and treatment. In the 1970s, German households began to be charged for stormwater services depending on an estimation of the stormwater burden for that particular household.[45] Stormwater management fees were reduced based on whether households had taken measures such as installing a green roof or paving a driveway, which encouraged sustainable land-use decisions.[46]

<https://www.sa.gov.au/__data/assets/pdf_file/0005/22766/Mandatory_plumbed_rainwater_tanks_for_class_one_buildings.pdf>.

42 Australian Bureau of Statistics, *Sources of Water and its Uses* (Catalogue No 4602.0.55.003, 30 October 2013) <http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/4602.0.55.003main+features3Mar%202013>.

43 See *Environmental Planning and Assessment Regulation 2000* (NSW) cl 164A; *State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004* (NSW) cl 3(3); NSW Government, *Water*, BASIX <https://www.basix.nsw.gov.au/iframe/basix-help-notes/water.html>.

44 Ralph Buehler et al, 'How Germany Became Europe's Green Leader: A Look at Four Decades of Sustainable Policymaking' (2011) 2(5) *Solutions Journal* 51, 59–60.

45 Ibid 59.

46 Ibid.

This model of legislative encouragement for sustainable water management is not alien to Australian policy thinking. As noted above, NSW mandates a 40% saving in mains water usage for new dwellings and South Australia mandates rainwater tanks for new dwellings. Drawing from the German stormwater example, NSW policies should redouble incentives for existing and new dwellings. This could be done by substantially rewarding homes who reduce their reliance on the mains water supply. By encouraging sustainable and effective water management decisions in the community, the government will decrease the pressures on the distribution of scarce water resources.

2 *Incentives for Local Government*

The second aspect evident in the German example is role of the centralised system of government in implementing innovative solutions. This was most important in the German economic model to encourage local city councils to experiment with the implementation of sustainable technologies. If such implementation is seen to be successful, then it can be more widely adopted. A 1996 survey by Germany's Gardening Central Association found that 50% of German cities offered incentives for building owners who installed green roofs.[47]

With the recent amalgamations of many city councils in NSW,[48] perhaps now is the opportunity to direct funding to encourage innovative water augmentation solutions. In adopting such an approach, better outcomes could be achieved compared to stand-alone federal or just local regulations.

E Conclusion

The existing NSW measures have laid a foundation towards achieving sustainable and effective water augmentation outcomes. However, by looking at successful strategies in other countries, such as Germany, it is evident that a greater emphasis on incentives directed at individual households and local governments could be used to replicate their success in encouraging societal appreciation of the need for effective management of water supplies.

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47 University of Hawaii, 'Feasibility Study of Green Roof Technologies in Urban Districts in Hawaii' (Report No SR-86, Hawaiian Legislature, December 2006) 27.

48 Department of Premier and Cabinet (NSW), *New Councils* (12 May 2016) Stronger Councils <https://www.strongercouncils.nsw.gov.au/new-councils/>; Sarah Gerathy, 'NSW Council Amalgamations: 19 New Local Bodies Created under Forced Mergers', *ABC News* (online), 12 May 2016 <http://www.abc.net.au/news/2016-05-12/new-councils-created-under-forced-mergers-across-nsw/7408152>.

Term of Reference (g)

The efficiency and sustainability of environmental water being managed by different State and Federal Government departments and agencies …

I *Introduction*

The management of the water resources in multi-jurisdictional river and aquifer systems can be more appropriately regulated by the federal government than by individual state governments. However, the Commonwealth currently has limited constitutional power to regulate water resources. This means that the continuance and expansion of environmental sustainability measures under the *Water Act* are dependent on the continued willingness of all States concerned to refer their legislative power to the Commonwealth.[49]

We submit that in light of the flexible and drastic measures that may be required to confront the changes in water availability brought about by climate change, the preservation of a cohesive federal regime of water management is paramount. Further, constitutional amendment should be considered to give the Commonwealth legislative power over water resources to protect long-term, knowledge-based environmental management from disruption due to unilateral policy-changes at a state level.

II *Current Constitutional Framework*

The *Australian Constitution* was drafted in a context which prioritised certain functions of water in a manner which is inappropriate in modern Australia. The only reference to the management of water in the *Constitution* comes from section 100, which states that the Commonwealth cannot legislate with regard to trade or commerce in a way which impedes the right to reasonable use of water. This section was included so that water security would be ensured against the competing aims of commerce in the Murray-Darling Basin.[50] However, providing only a restriction on how the Commonwealth could legislate on matters that may impact water supply, and granting no power to the Commonwealth to

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49 While the law is unsettled, it is likely that a Commonwealth law will become invalid to the extent it operates in a jurisdiction that withdraws its referral: see Andrew Lynch, 'After a Referral: The Amendment and Termination of Commonwealth Laws Relying on s 51(xxxvii)' (2010) 32 *Sydney Law Review* 363, 380–7. Further, as argued in response to term of reference (f) above, the scheme under the *Water Act* arguably does not implement, Australia's international treaty obligations, and may therefore not be supported by the s 51(xxix) external affairs power: see *Victoria v Commonwealth* (1996) 187 CLR 416, 487 (Brennan CJ, Toohey, Gaudron, McHugh and Gummow JJ).

50 Dominic Skinner and John Langford, 'Legislating for Sustainable Basin Management: The Story of Australia's Water Act (2007)' (2013) 15 *Water Policy* 871, 875–6.

legislate for the purposes of environmental sustainability, has proven challenging in a modern Australia which faces the challenge of climate change.[51]

Many of Australia's water sources, most notably the Murray-Darling Basin, cross state jurisdictions. As a result, Commonwealth legislation has been an integral element of attempts to prevent the degradation of water quality and to ensure water security for each state that depends on a particular river to supply its water.[52] However, as a result of the failure of the *Constitution* to give the Commonwealth power to legislate on the management of water resources under section 51, the ability of the Commonwealth legislature to achieve sustainable and effective water management is largely contingent on the agreement of relevant states to refer their legislative power to the Commonwealth.

For any legislation in this area to be passed or amended, it requires the agreement of every state affected. This process has been criticised in the past for being excessively slow, which has an especially unacceptably marked impact in times of drought when water security is needed urgently.[53] The difficulty and lack of expediency associated with this process is especially notable when Commonwealth governments have been required to broker these agreements with State governments of an opposing party, as occurred in June 2007 when the Victorian Government, then Labor controlled, refused to refer power to the Liberal Commonwealth.[54]

If the States are unwilling to refer the necessary power however, the Commonwealth is able to rely on the external affairs power instead, implementing the *Convention on Biodiversity Convention* and the *Ramsar Convention*.[55] This is what occurred following the refusal of the Victorian Government to refer power in 2007.[56] However, the resulting legislation was circumscribed by the limited powers offered to the Commonwealth in legislating under the external affairs power, as the *Water Act* had to fall within the provisions of the international legislation relied upon to retain its validity.[57] As a result, the Commonwealth had very limited flexibility in setting environmental objectives in its allocation of water under the Act, as they were required to adhere to the generalised target figures provided in

51 Ibid 873–4.

52 Paul Kildea and George Williams, 'The Constitution and the Management of Water in Australia's Rivers' (2010) 32 *Sydney Law Review* 595, 595.

53 Dominic Skinner and John Langford, 'Legislating for Sustainable Basin Management: The Story of Australia's Water Act (2007)' (2013) 15 *Water Policy* 871, 878.

54 Paul Kildea and George Williams, 'The Constitution and the Management of Water in Australia's Rivers' (2010) 32 *Sydney Law Review* 595, 605.

55 Robyn Briese, Alice Kingsland and Robert Orr, 'Swimming in New Waters: Recent Reforms to Australian Water Law' (Legal Briefing No 90, Australian Government Solicitor, 21 July 2009) <http://www.ags.gov.au/publications/legal-briefing/br90.htm>.

56 Paul Kildea and George Williams, 'The Constitution and the Management of Water in Australia's Rivers' (2010) 32 *Sydney Law Review* 595, 605.

57 Dominic Skinner and John Langford, 'Legislating for Sustainable Basin Management: The Story of Australia's Water Act (2007)' (2013) 15 *Water Policy* 871, 880.

international legislation regardless of the suitability of these for Australia, the driest inhabited continent on earth.[58] Furthermore, the limited scope provided by the external affairs power complicated the ability of the Commonwealth to effectively balance economic, social and environmental factors, as power was limited largely to the environment.[59]

III *Future Directions in Effective Water Management*

An examination of recent past attempts to manage Australia's water resources makes it apparent that an effective legislative framework requires the expediency and reduced politicisation facilitated by the ability of the Commonwealth to legislate on water management without requiring the consent of all States. Such speed and efficiency is especially necessary in Australia, where droughts can occur frequently and have a dramatic effect on Australia's agriculture industry.[60]

This impact is especially notable when taking into account the impacts that climate change will continue to have on the frequency and severity of Australia's droughts.[61] Furthermore, the external affairs power has proven an insufficient alternative to referral of power, as this does not allow for specific environmental targets to be set which directly respond to Australia's unique conditions. Additionally, the external affairs power largely confines the application of legislation to the environment, not allowing legislators to take into account the required balance between social and economic factors such as the necessity for water security.

Therefore, only two options present themselves as remaining alternatives. The first is a full referral of legislative power from the states to the Commonwealth, particularly with regards to transboundary rivers. However, failing this, a constitutional change, as suggested by Kildea and Williams and by the Liberal Party in 2010, must be considered to ensure that Australia can respond to issues in water management in a specific and timely manner.[62] While this may be drastic, in the face of increasingly frequent and long droughts,[63] it may be the only option to address the failures of the current system.

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58 Ibid 873, 881.

59 Ibid 881.

60 Will Steffen, *Thirsty Country: Climate Change and Drought in Australia* (Climate Council of Australia, 2015) i–ii.

61 Ibid.

62 Tony Abbott, 'Address to the Sydney Institute' (Speech delivered at the Sydney Institute, Sydney, 14 January 2010) < http://www.theaustralian.com.au/archive/politics/full-text-of-tony-abbotts-address-to-the-sydney-institute/story-e6frgczf-1225819327681>; Paul Kildea and George Williams, 'The Constitution and the Management of Water in Australia's Rivers' (2010) 32 *Sydney Law Review* 595, 615–16.

63 Will Steffen, *Thirsty Country: Climate Change and Drought in Australia* (Climate Council of Australia, 2015) i–ii.

Term of Reference (h)(ii)

The management, appropriateness, efficiency and reporting of: … conveyance and loss water

I *Introduction*

While the people living in the Murray-Darling Basin constitute less than 10% of Australia's population,[64] the industrial and household use of water from the Murray-Darling Basin accounts for about 60% of Australia's total water consumption.[65] As such, sustainable water usage in the Murray-Darling Basin (and alternatively its mismanagement) has a significant social, economic and cultural impact on a national scale. In response to sub-paragraph h(ii) of the Committee's Terms of Reference, we will assess the regulatory framework governing conveyance and loss water in the Murray-Darling Basin, to achieve sustainable water conveyance in the River Murray System.

Under statute, 'conveyance water' is the 'water in the River Murray System required to deliver water to meet critical human water needs ['CHWN'] as far downstream as Wellington in South Australia'.[66] CHWN is statutorily defined as the minimum amount of water, provided from Basin water resources that is required for (a) core human consumption, as well as (b) core non-human consumption that a failure to satisfy would cause 'prohibitively high social, economic or national security costs'.[67]

As such, there is a relationship between CHWN and conveyance water requirements. However, a significant difference exists between the two values, with the conveyance water required being a substantial deal greater than the volume of CHWN. This is because the volume of conveyance water

64 The population of the 119 shires within the Murray-Darling Basin (excluding Canberra) was estimated to be about 1.85 million people in 2013–14: Murray-Darling Basin Authority, *Understanding the Effects of Water Reform on Basin Communities and Industries* (19 November 2015) <http://www.mdba.gov.au/socio-economic-profile-murray-darling-basin>; the population of Canberra in the same period reached approximately 386 000, while the total population of Australia reached 23.5 million: Australian Bureau of Statistics, 'Regional Population Growth, Australia, 2013–14' (Catalogue No 3218.0, 31 March 2015) <http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/3218.0Main+Features12013-14?OpenDocument>.

65 Total diversion, including for the water supply industry, from the Murray-Darling Basin was 11 278 GL: Murray-Darling Basin Authority, *Annual Report 2013–14* (2014) 65; total Australian water consumption was 18 644 GL: Australian Bureau of Statistics, 'Water Account, Australia, 2013–14' (Catalogue No 4610.0, 26 November 2015).

66 *Water Act 2007* (Cth) s 86A(4).

67 *Water Act 2007* (Cth) s 86A(2).

is equal to the expected volume of 'loss water', which are the water losses in an operator's network (or specific river system) through processes such as evaporation and seepage.[68]

II *Management and Appropriateness*

Conveyance and loss water in the Murray-Darling Basin is monitored and managed by the Murray-Darling Basin Authority ('MDBA'), which implements the *Basin Plan 2012* (Cth), as stipulated by the *Water Act 2007* (Cth).[69] The *Basin Plan* guides government, regional authorities and communities on issues of sustainable water use and management in the Basin to give greater certainty for future water availability.[70] The *Basin Plan* manages conveyance water by expressly stating the CHWN of each of the referring states in the River Murray System,[71] and the total amount of conveyance water required.[72]

A Critical Human Water Needs

The *Basin Plan* identifies the amount of water required to meet the CHWN of the communities dependent on the River Murray System within a particular State.[73] On an annual basis:

- NSW requires 61GL;
- Victoria requires 77GL; and
- South Australia requires 204 GL.[74]

The criteria relied upon in calculating CHWN for each State is elusive, defined in neither the *Basin Plan* nor the *Water Act*. However, the MDBA's *Guide to the Proposed Basin Plan* establishes four general criteria upon which the quantity is determined:

1 assumed average daily community use per person (including community services and commercial use);

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68 Australian Competition and Consumer Commission, *Water Market Rules*, Final Advice to the Minister for Climate Change and Water (2008) 40–1.

69 *Water Act 2007* (Cth) ss 86B–86E.

70 Preceding the *Basin Plan* being signed into law, then Prime Minister Julia Gillard emphasised its effect on sustainable water use, announcing it would 'provide greater certainty for future water availability ensuring all those dependant on a sustainable river system can face the future with greater confidence': Department of the Prime Minister and Cabinet, 'Returning the Murray-Darling Basin to Health' (Media Release, Transcript ID 18 865, 26 October 2012) <http://pmtranscripts.dpmc.gov.au/release/transcript-18865>. See also Murray-Darling Basin Authority, *Basin Plan* (5 November 2015) <http://www.mdba.gov.au/basin-plan>.

71 *Basin Plan* s 11.03.

72 *Basin Plan* s 11.04.

73 *Water Act 2007* (Cth) s 86B(1)(a); *Basin Plan* s 11.03.

74 *Basin Plan* s 11.03. These are the required amounts per 'water accounting period' which is defined to be the 12 months following 1 June of a given year: at s 11.02.

2 an allowance for extraordinary circumstances;

3 consideration of alternate water supplies; and

4 allowance for distribution losses from River Murray System to point of supply.[75]

These criteria are appropriate and effective gauges of CHWN for two primary reasons. Firstly, Connell and Grafton state that 'the best [water resource] plans are those that are developed with the inputs of scientists and modelers using reliable data'.[76] This can be seen to apply to the above criteria, with criteria 1 and 2 supported by extensive modelling and statistical analysis conducted by CSIRO.[77] Similarly, criterion 3 has been a topic of extensive research for government organisations, such as through the 'Water for the Future' initiative, which has a multi-faceted approach to securing alternative water supplies.[78]

Second, the generality of the criteria affords a flexible approach in determining CHWN. The Bureau of Meteorology and CSIRO have projected that average rainfall within the Murray-Darling Basin will decrease, with a likely increase in both the frequency and severity of droughts as a direct consequence of global warming.[79] As such, we argue that a flexible approach is vital for river models integrating the effect of climate change and changing water-use patterns in order to support the monitoring of the system with water allocations.[80] These propositions are further supported by Collen and Grafton, who urge that 'plans should also be flexible to climactic variability … and also new information and understandings'.[81] In response to changing environmental conditions, an appropriately flexible regulatory framework is required to mediate an holistic approach to sustainability.

However, this non-prescriptive approach gives States the express authority to manage the needs of their own community and determine which uses of water are, or are not, included within the definition

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75 Murray Darling Basin Authority, *Guide to the Proposed Basin Plan* (2010) vol 2, 240.

76 Daniel Connell and R Quentin Grafton, 'Water Reform in the Murray-Darling Basin' (2011) 47(12) *Water Resources Research* W00G03, 5.

77 Neville D Crossman et al, 'Status of the Aquatic Ecosystems of the Murray-Darling Basin and a Framework for Assessing the Ecosystem Services They Provide' (Interim Report to the Murray-Darling Basin Authority, CSIRO, 28 November 2011) 39–42.

78 Department of Sustainability, Environment, Water, Population and Communities (Cth), 'Water for the Future' (Fact Sheet, October 2010) <https://www.environment.gov.au/system/files/resources/7d4c4922-9374-4e19-bf8a-5b5c152ac6bb/files/water-future.pdf>.

79 Bureau of Meteorology and CSIRO, 'State of the Climate 2014' (Report, 2014) 15.

80 See also KA Robinson et al, 'A Flexible Approach for Integrating Climate Change Projections with Changes in Human Water Use on River Systems' in EM Valentine et al, *Proceedings of the 34th World Congress of the International Association for Hydro-Environment Research and Engineering: 33rd Hydrology and Water Resources Symposium and 10th Conference on Hydraulics in Water Engineering* (Engineers Australia, 2011) 1490.

81 Daniel Connell and R Quentin Grafton, 'Water Reform in the Murray-Darling Basin' (2011) 47(12) *Water Resources Research* W00G03, 5.

of CHWN.[82] This is because water management was historically conducted at a State level,[83] which, in the present day, has led to different priorities in each State and reduced cooperation between jurisdictions.[84]

B Conveyance and Loss Water

The *Basin Plan* stipulates the amount of conveyance water required to deliver the water to satisfy the CHWN as established above is 1596 GL per year.[85] This amount is based on observed losses from major storages and the River Murray itself.[86]

The *Guide to the Proposed Basin Plan* provides further explanation of this calculation, breaking the 1596GL figure into three components:

1 150 GL/y for evaporation and seepage from the major storages;

2 750 GL/y for evaporation and seepage in the River Murray between the major storages and the South Australian border; and

3 696 GL/y for dilution in the River Murray between the South Australian border and Wellington.[87]

We believe that this approach is appropriate and effective as the criteria accounts for the fundamental role evaporation and seepage play in water loss due to the Murray-Darling Basin flowing through a semi-arid climate. Historically, it was estimated that up to 95% of the artesian water in NSW (a significant contributor to surface-flow in most physiographic and climatic settings)[88] was lost through evaporation and seepage.[89] Additionally, the average annual loss of surface water and artesian water in the Murray-Darling Basin since 2001 amounts to 20 km^3, which equates to approximately 150% of total water usage in the Murray-Darling Basin under 'normal conditions'.[90] As such, evaporation and

82 Murray Darling Basin Authority, *Guide to the Proposed Basin Plan* (2010) 240.

83 Daniel Connell and R Quentin Grafton, 'Water Reform in the Murray-Darling Basin' (2011) 47(12) *Water Resources Research* W00G03, 1.

84 Jennifer M McKay, 'Australian Water Allocation Plans and the Sustainability Objective – Conflicts and Conflict-Resolution Measures' (2011) 56 *Hydrological Sciences Journal* 615, 616.

85 *Basin Plan* s 11.04 and Note 1.

86 The 1596 GL is based on observed losses from the major storages and the River Murray upstream of the South Australian border during years of low water availability: ibid.

87 Murray Darling Basin Authority, *Guide to the Proposed Basin Plan* (2010) 242.

88 The USGS Water Science School, *Rivers Contain Groundwater* (2 May 2016) US Geological Survey <http://water.usgs.gov/edu/rivers-contain-groundwater.html>.

89 Kathryn Wells, *Australian River Catchments and the Great Artesian Basin* (24 March 2016) Australian Government <http://www.australia.gov.au/about-australia/australian-story/austn-river-catchments>.

90 Marc J Leblanc et al, 'Basin-scale, Integrated Observations of the Early 21st Century Multiyear Drought in Southeast Australia' (2009) 45(4) *Water Resources Research* W04408, 9.

seepage are the predominant causes of conveyance water loss which is reflected in the emphasis in the criteria above.[91]

C Three-Tiered Approach

We also voice our support for the three-tiered water sharing arrangements which apply to conveyance water in the River Murray System. These are a response to the Millennium Drought which catalysed water regulation reform, culminating in the *Basin Plan*.[92]

The *Basin Plan* sets out the relevant Tier 2 and Tier 3 arrangements, as opposed to the normal Tier 1 arrangements. In particular, they establish triggers and cessation protocols for the periods of very low water availability (Tier 2) or extreme and unprecedented conditions (Tier 3).[93] Due to the pre-emptive nature of these triggers, the tiered approach is an appropriate (although yet untested) safety mechanism in times of extreme drought. It speaks to the common position of the Commonwealth and Basin States that CHWN and conveyance water are of the highest priority in the River Murray System.[94]

The introduction of the conveyance water provisions of the *Basin Plan* and the three-tiered system has been a change in the management of CHWN that provides assurance for communities in the case of emerging critical water shortages, during which these dependent communities will be given the highest priority.[95] The conveyance water provisions and the tiered system is therefore an appropriate regulatory framework.

D Mechanisms of Reporting

The *Basin Plan* establishes an extremely robust and effective dual method of reporting on matters relating to CHWN and conveyance water.

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91 Murray Darling Basin Authority, *Guide to the Proposed Basin Plan* (2010) 242.

92 The Millennium Drought was experienced predominantly in the southern region of the Murray-Darling Basin, and ended in 2010. It was classified the most severe drought in the past 114 years: ibid 239; Daniel Connell and R Quentin Grafton, 'Water Reform in the Murray-Darling Basin' (2011) 47(12) *Water Resources Research* W00G03, 1.

93 *Basin Plan*, s 11.09–16.

94 The MDBA has stressed that 'water for critical human needs must be given the highest priority for the communities that are dependent on Basin water resources and that conveyance water will receive first priority in the River Murray system': Murray Darling Basin Authority, *Guide to the Proposed Basin Plan* (2010) 239.

95 Anna Vidot, 'Water Flows into the Murray-Darling System Now Equal to 2002, Fifth-Driest Year on Record' *ABC Rural* (online), 23 October 2015 <http://www.abc.net.au/news/2015-10-23/murray-darling-inflows-on-par-with-2002/6879280>.

The *Basin Plan* establishes that the 'prioritisation of critical human water needs' is to be reported on an annual basis.[96] The report focuses on the commencement of Tier 2 or Tier 3 water sharing arrangements, as they are the principle mechanism for managing CHWN and conveyance water.[97] The assessment is based on two indicators:

1 the number of days that Tiers 1, 2 and 3 water sharing arrangements have been applied; and

2 details of the processes and action(s) taken in response to a Tier 2 or 3 event.[98]

Furthermore, section 13.05 requires holistic evaluations of the effectiveness of the *Basin Plan* in reference to the entirety of the matters in schedule 12, including CHWN. This evaluation is published in the MDBA Annual Report, and addresses the efficiency of key processes in the River Murray System.[99]

As such, there exists a dual reporting mechanism that operates on an annual basis, providing an extensive report on the operation of conveyance water within the Murray-Darling Basin. This approach has strong support, with the National Water Commission stating that thorough reporting is 'critical for the transparency and accountability of water planning'.[100] Similarly, the Planning Institute of Australia endorses 'monitoring and reporting' as one of the fundamental requisites in planning for water quality and management.[101]

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96 *Basin Plan* ss 13.14(1), 13.13 (definition of 'reporting period'), sch 12 item 20.

97 *Basin Plan* sch 12 item 13.

98 Murray Darling Basin Authority, 'Report on Managing for Critical Human Water Needs' (Reporting Template and Statement of Assurance – Matter 13, 2015) 2.

99 Key evaluation questions are set out in section 13.06. Of particular note are the questions:

> (b) to what extent have the objectives, targets and outcomes set out in the *Basin Plan* been achieved?
> …
> (e) how could the effectiveness of the *Basin Plan* be improved?
> (f) to what extent were the actions required by the *Basin Plan* suited to meeting the objectives of the *Basin Plan*?

100 National Water Commission, *Monitoring and Evaluation for Adaptive Water Management: Issues Paper* (2013) viii.

101 Planning Institute of Australia, *Policy: Water and Planning* <https://www.planning.org.au/policy/water-and-planning>.