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SYMPOSIUM ARTICLE

Towards a Holistic Environmental Flow Regime in Chile: Providing for Ecosystem Health and Indigenous Rights†

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Abstract

A widespread response to the pressures placed on the ecological condition of rivers is the design and implementation of environmental flow regimes in domestic regulatory frameworks for water. Environmental interests in water are not confined to hydrological functioning but include relationships between water resources and human cultural and economic livelihoods, including those of Indigenous communities. Since the mid-1980s there has been some provision for environmental flows in Chilean law. However, the legal and policy requirements are limited in scope and have been poorly implemented by regulatory institutions. In this article we critically examine the treatment of environmental flows in Chilean legal and policy frameworks. We argue that there is an urgent need for a comprehensive minimum flow regime in Chile to protect the environmental qualities of rivers, which must also reflect and provide for Indigenous water rights and interests. The developing constitutional crisis in Chile, the most significant political crisis since the end of the Pinochet dictatorship (1973–90), highlights the need to revisit the sensitive and unresolved issues of water governance and equity.

Keywords: Environmental flows, Cultural flows, Indigenous water rights, Water equity and distribution, Chile

1. INTRODUCTION

In Chile, as in many parts of the world, water resources are under growing pressure. Chile has highly variable water conditions, from very arid areas in the north to the

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well-watered south.[1] As a long, thin country bordered by the Cordillera de Los Andes on one side and the Pacific Ocean on the other, Chile is a country of rivers. More than 1,251 rivers located in 101 basins[2] run the length of Chile, supplying water for (often competing) social, cultural, economic, and environmental uses. In some areas, such as the north of Chile, water is scarce and may be over-allocated. In other areas at the centre of the country, rivers are modified from their natural state and may be contaminated by pollution.[3] Overall, water quality has improved in recent years in Chile because of advances in wastewater treatment,[4] although Chilean water resources continue to experience elevated salinity, metal concentrations, and high levels of nitrates.[5] In many parts of Chile, especially central and northern regions, there is strong economic demand for water for agriculture, urban and industry (mining and energy) purposes,[6] which compete with the social and environmental uses of rivers. However, in many instances in the south, water availability exceeds demand,[7] and some rivers remain free from major human intervention and damage.[8]

Chile also has an important Indigenous heritage, with a number of distinct Indigenous peoples holding traditional connections and rights to land and water resources throughout the country,[9] regardless of whether or how these interests are recognized by governments. Indigenous conceptions of water resources are routinely described in the scholarship as being different from dominant or western approaches, which often frame resources in terms of property or use rights,[10] and this happens in

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1 Organisation for Economic Cooperation and Development (OECD), *Water Resources Allocation: Chile* (2015), available at: https://www.oecd.org/chile/Water-Resources-Allocation-Chile.pdf.

2 Dirección General de Aguas (DGA), *Atlas del agua* [Atlas of Water] (DGA, Ministerio de Obras Públicas, 2016), p. 18.

3 R. Valdés-Pineda et al., 'Water Governance in Chile: Availability, Management and Climate Change', (2014) 519(PC) *Journal of Hydrology*, pp. 2538–67, at 2539, 2544; P. Pino et al., 'Chile Confronts Its Environmental Health Future after 25 Years of Accelerated Growth' (2015) 81(3) *Annals of Global Health*, pp. 354–67; Á. Alonso, R. Figueroa & P. Castro-Díez, 'Pollution Assessment of the Biobío River (Chile): Prioritization of Substances of Concern under an Ecotoxicological Approach' (2017) 59(5) *Environmental Management*, pp. 856–69.

4 G. Donoso, 'Introduction', in G. Donoso (ed.), *Water Policy in Chile* (Springer, 2018), pp. 1–10, at 2.

5 See A.S. Vega, K. Lizama & P.A. Pastén, 'Water Quality: Trends and Challenges', in Donoso, ibid., pp. 25–51.

6 See C.J. Bauer, 'Dams and Markets: Rivers and Electrical Power in Chile' (2009) 49(3/4) *Natural Resources Journal*, pp. 583–651; J. Budds, 'Power, Nature and Neoliberalism: The Political Ecology of Water in Chile' (2004) 35(3) *Singapore Journal of Tropical Geography*, pp. 322–42; S. Babidge & P. Bolados, 'Neoextractivism and Indigenous Water Ritual in Salar de Atacama, Chile' (2018) 45(5) *Latin American Perspectives*, pp. 170–85; F.M. Camacho, 'Competing Rationalities in Water Conflict: Mining and the Indigenous Community in Chiu, El Loa Province, Northern Chile' (2001) 33(1) *Singapore Journal of Tropical Geography*, pp. 93–107.

7 See Valdés-Pineda et al., n. 3 above, p. 2563.

8 E.g., according to the Chilean National Committee on Large Dams, there are no large dams in the Austral Region of southern Chile: see http://www.icoldchile.cl/directorio (in Spanish).

9 J. Aylwin, *Pueblos indigenas de Chile: antecedentes historicos y situacion actual* [Indigenous Communities of Chile: History and Current Situation] (Instituto de Estudios Indigenas Universidad de la Frontera, 1994) vol 1; N. Yañez & R. Molina, *Las aguas indigenas en Chile* [Indigenous Waters in Chile] (LOM Ediciones, 2011).

10 See, e.g., S. Jackson, 'Recognition of Indigenous Interests in Australian Water Resource Management, with Particular Reference to Environmental Flow Assessment' (2008) 2(3) *Geography Compass*, pp. 874–98, at 876.

Chile too. In the south of Chile, for example, Mapuche communities conceive of water resources as being connected to their ancestors, to metaphysical entities and to the total embodiment of nature.[11] These communities have a sacred connection with and respect for water. For other Indigenous groups in the north, such as the Aymara and Atacameño communities for whom water resources are a vital element of the agricultural economy, water plays an important role in Indigenous political organization and identity.[12]

In line with international developments[13] there is growing concern that anthropogenic water extractions and overuse of freshwater resources have led to pollution and low or absent flow rates in Chile's rivers.[14] Several scholars/activists have expressed concern about the ongoing exclusion of Indigenous peoples from water access and governance, and the failure of Chilean law to reflect cultural rights, aspirations, and needs.[15] Chile's water crisis is playing out in the context of growing social and political movements against structural inequality.[16] It is exacerbated by the effects of climate change,[17] and the inability of regulatory frameworks and institutions to adapt quickly enough to manage water as a scarce and threatened resource.[18]

In this article we examine the limited provision and implementation of environmental flows in Chilean law and policy, and consider the treatment of Indigenous water rights and interests in their planning. This examination draws on an in-depth analysis of Chilean legislation, case law, and legislative reform proposals and debates in the

[11] See generally L. Barrera-Hernández, 'Indigenous Peoples, Human Rights and Natural Resource Development: Chile's Mapuche Peoples and the Right to Water' (2005) 11(1) *Annual Survey of International & Comparative Law*, pp. 1–29.

[12] See M. Prieto & M. Prieto, 'Bringing Water Markets Down to Chile's Atacama Desert' (2016) 41(2) *Water International*, pp. 191–212, at 192; M. Prieto, 'Privatizing Water and Articulating Indigeneity: The Chilean Water Reforms and the Atacameño People (Likan Antai)' (Ph.D. thesis, The University of Arizona, 2014) (on file with the author); M. Castro et al., *El derecho consuetudinario en la gestión del riego en Chiapa. Las aguas del 'Tata Jachura'* [Customary Rights in Irrigation Management in Chiapa. The Waters of 'Tata Jachura'] (Konrad Adenauer Stiftung, 2017), available at: http://www.libros.uchile.cl/681; S. Babidge, 'Contested Value and an Ethics of Resources: Water, Mining and Indigenous People in the Atacama Desert, Chile' (2016) 27(1) *The Australian Journal of Anthropology*, pp. 84–103, at 92.

[13] See generally A.H. Arthington, *Environmental Flows: Saving Rivers in the Third Millennium* (University of California Press, 2012), p. 14 (for an overview of environmental flows in international theory and practice).

[14] See C.J. Bauer, 'Water Conflicts and Entrenched Governance Problems in Chile's Market Model' (2015) 8(2) *Water Alternatives*, pp. 147–72, at 159 (for a contemporary overview of Chile's water management challenges); but see Donoso, n. 4 above, p. 2.

[15] E. Macpherson, *Indigenous Rights to Water in Law and Regulation: Lessons from Comparative Experiences* (Cambridge University Press, 2019), pp. 161–210; Á. Marín, 'Constitutional Challenges of the South: Indigenous Water Rights in Chile Another Step in the Civilizing Mission?' (2017) 33(3) *Windsor Yearbook of Access to Justice*, pp. 87–110, at 87; M.D. Davis, 'Indigenous Rights and Modern Water Management in Chile', *Critical Transitions in Water and Environmental Resources Management* (World Water and Environmental Resources Congress, 2004), pp. 1–12, at 3–4, available at: https://ascelibrary.org/doi/10.1061/40737%282004%29116.

[16] See J. Bartlett, 'Chile Protests: UN to Investigate Claims of Human Rights Abuses after 18 Deaths', *The Guardian*, 24 Oct. 2019, available at: https://www.theguardian.com/world/2019/oct/24/chile-protests-human-rights-un-investigation. See generally Bauer, n. 14 above (which discusses the intensification of water conflicts in Chile in the past decade and their rising profile in public debate).

[17] Valdés-Pineda et al., n. 3 above, p. 2563.

[18] See Marín, n. 15 above, p. 97.

political, historical, and cultural contexts, most of which is yet to be published for an English-speaking audience.[19] In doing so we also draw on our combined experience as legal researchers and practitioners working in environmental law and Indigenous rights in Chile and Australasia, for Indigenous peoples, governments, and private interests.

We are concerned with the development and implementation of law and policy in context, and so we pay attention both to the written content of laws, judicial decisions, and law reform proposals and debates, identified through doctrinal legal research methods, and their contextualization in the interdisciplinary scholarship.[20] Public and academic debates around water, human rights and Indigenous rights are highly polarized in Chile,[21] and we have considered and reconciled a spectrum of scholarly and public opinion, although our analysis focuses on the actual laws, policies, and jurisprudence in force. During the writing of this article, Chile erupted into a state of social protest not seen since the time of the Pinochet dictatorship (1973–90). This has required and enabled us to consider the provision for environmental flows in the context of the unfolding social and constitutional crisis. As the Chilean legal and policy landscape is developing rapidly in response to this crisis, there is media coverage, but no academic commentary or analysis for many of the legal or policy proposals covered in this article.

Given Australia's present experience with environmental flows and more recent agitation and concern around Indigenous water rights, including the 'cultural flows' policy,[22] we make occasional reference to the Australian experience. However, we emphasize that the Australian experience must be treated carefully, in its own particular historical, political, and social contexts, as a model with its own challenges and flaws.[23] We do not advocate the adoption or 'transplantation'[24] of the Australian approach in Chile, but maintain that reflecting on foreign experiences can help to identify and potentially reveal new responses to domestic concerns.[25]

We argue that there is a need for a comprehensive minimum flow regime in Chile to protect environmental or ecological water qualities and take into account Indigenous rights and interests, which acknowledges the social as well as ecological functions of environmental flows. At a minimum, this regime must exempt users who leave river

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19 For another recent example of English language commentary see Bauer, n. 14 above.

20 See M.V. Hoeke, 'Deep Level Comparative Law', in M.V. Hoeke (ed.), *Epistemology and Methodology of Comparative Law* (Hart, 2004), pp. 165–95, at 165.

21 Bauer, n. 14 above.

22 See A.C. Horne, E.L. O'Donnell & R.E. Tharme, 'Mechanisms to Allocate Environmental Water', in A.C. Horne et al. (eds), *Water for the Environment: From Policy and Science to Implementation and Management* (Academic Press, 2017), pp. 361–98; Australian Government, Murray Darling Basin Authority, 'Cultural Flows', updated 30 June 2020, available at: https://www.mdba.gov.au/discover-basin/cultural-flows.

23 For a discussion of the ongoing inadequacies of Australian water law see, e.g., S. Jackson, 'Enduring and Persistent Injustices in Water Access in Australia', in A. Lukasiewicz et al. (eds), *Natural Resources and Environmental Justice: Australian Perspectives* (CSIRO Publishing, 2017), pp. 121–32.

24 For a discussion of legal transplants and their risks see J. Gillespie & P. Nicholson, *Law and Development and the Global Discourses of Legal Transfers* (Cambridge University Press, 2012).

25 L. De Stefano, 'International Initiatives for Water Policy Assessment: A Review' (2010) 24(11) *Water Resources Management*, pp. 2449–66, at 2450.

flows in-stream, including Indigenous peoples and environmentalists, from paying fines for 'non-use'. This is not at the expense of substantive water rights for Indigenous peoples that may be used for consumptive, productive or economic purposes, but should be implemented alongside existing mechanisms that fund the recognition and allocation of water rights for Indigenous peoples.[26]

We acknowledge that setting aside an adequate water allocation for environmental or cultural purposes in Chile will not be easy, and that transformative water reform has, until now, been impossible to secure.[27] In the context of finite water resources, safeguarding environmental flows and setting aside a flow of water for Indigenous use may be costly and politically unpalatable, potentially requiring the redirection of water away from consumptive, economic purposes. Yet, if the Chilean government is to ensure safe and reliable water resources for future generations, robust legal and policy frameworks that safeguard both environmental and cultural water uses will be crucial. The current constitutional crisis in Chile, the most significant political crisis since the end of the Pinochet dictatorship, highlights the need to strive towards more inclusive and equitable water governance and allocation.[28]

2. A HOLISTIC APPROACH TO ENVIRONMENTAL FLOWS

The challenge of effective water regulation to ensure water availability and quality for present and future generations is not particular to Chile, but is a shared concern for the world community.[29] Despite global concern about the availability of clean and sufficient water into the future, there is no international treaty that addresses access to and conservation of freshwater.[30] There is growing international attention, however, to the right to water and the importance of water for ecosystem health, independently of human welfare concerns. The scholarship in this field posits a clear link between resource health and human culture and wellbeing, consistent with trends towards more holistic water management concepts like the 'hydrosocial cycle',[31] and with the

[26] See the discussion of the need for allocation of consumptive water rights for Indigenous peoples, including in Chile, in Macpherson, n. 15 above, pp. 226–40.

[27] See Bauer, n. 14 above (explaining the historical inability to fundamentally transform Chile's ideologicized water law and policy model).

[28] As indications of local trends see P. Bonnefoy, 'Chile's President Says He Will Support a New Constitution', *The New York Times*, 11 Nov. 2019, available at: https://www.nytimes.com/2019/11/11/world/americas/chile-protests-new-constitution.html. See also the recent constitutional proposal: 'Presentan reforma constitutional que consagra el Derecho Humano al agua' [Presentation of a Constitutional Amendment to Grant Human Rights to Water], *Diario Constituticional*, 25 Oct. 2019, available at: https://www.diarioconstitucional.cl/noticias/actualidad-legislativa/2019/10/25/presentan-reforma-constitucional-que-consagra-el-derecho-humano-al-agua.

[29] See generally F. Sultana & A. Loftus (eds), *The Right to Water: Politics, Governance and Social Struggles* (Taylor and Francis, 2013); M. Langford & A. Russell, *The Human Right to Water: Theory, Practice and Prospects* (Cambridge University Press, 2017).

[30] T. Stephens, 'Reimagining International Environmental Law in the Anthropocene', in L.J. Kotzé (ed.), *Environmental Law and Governance for the Anthropocene* (Hart, 2017), pp. 31–54, at 44.

[31] See J. Linton, 'Modern Water and its Discontents: A History of Hydrosocial Renewal' (2014) 1(1) *WIREs: Water* online articles, pp. 111–20, available at: http://wires.wiley.com/WileyCDA/WiresArticle/wisId-WAT21009.html.

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broadening of scientific approaches, which now tend to conceive of natural resources as 'socio-ecological systems'.[32]

The need to protect water for human and ecosystem health is increasingly acknowledged in a number of international legal documents. The human right to water, first recognized by the United Nations in 2010,[33] is concerned primarily with ensuring access to water for drinking and sanitation.[34] There is a 'remarkable gap' between the growing global consensus to recognize access to water for basic domestic purposes as a human right, and legal frameworks that actually govern water access.[35] Moreover, there is a need to broaden the conceptualization of the human right to water to support the protection and safeguarding of water for a range of social, cultural, and environmental purposes. Failure to protect rivers from pollution or over-extraction, for example, has a direct impact on the realization of the human right to water. Arguably, therefore, the normative content of the right to water obliges states to ensure both water quality and quantity.[36] In this regard, the human right to water intersects with other developing areas of human rights and the environment in international law, including the right to a clean and healthy environment[37] and the rights of Indigenous peoples over natural resources and territories.[38] International debates around human rights, the environment and water are also playing out in the emerging transnational take on environmental constitutionalism,[39] or 'the constitutional incorporation of substantive and procedural environmental rights, responsibilities and remedies to protect the natural environment',[40] especially in Latin America where some of the 'most innovative and energetic' approaches to environmental constitutionalism are developing.[41]

International concern surrounding water and its numerous values and uses is reflected in the 2030 Agenda for Sustainable Development and its Sustainable Development Goals (SDGs), in particular SDG 6, which enjoins states to '[e]nsure

[32] See generally L.M. Berrouet, J. Machado & C. Villegas-Palacio, 'Vulnerability of Socio-Ecological Systems: A Conceptual Framework' (2018) 84 *Ecological Indicators*, pp. 632–47.

[33] United Nations General Assembly (UNGA) Agenda Item 48, 'The Human Right to Water and Sanitation' (26 July 2010), UN Doc. A/64/L.63/Rev.1, available at: https://undocs.org/en/A/64/L.63/Rev.1.

[34] J. Gilbert, *Natural Resources and Human Rights: An Appraisal* (Oxford University Press, 2018), p. 58.

[35] Langford & Russell, n. 29 above, p. 58.

[36] I. Winkler, *Human Right to Water: Significance, Legal Status and Implications for Water Allocation* (Hart, 2014), pp. 109, 126, 197–8.

[37] See generally J.H. Knox & R. Pejan, *The Human Right to a Healthy Environment* (Cambridge University Press, 2018).

[38] See generally S.J. Anaya, 'Divergent Discourses about International Law, Indigenous Peoples, and Rights over Lands and Natural Resources: Toward a Realist Trend Papers' (2005) 16 *Colorado Journal of International Environmental Law and Policy*, pp. 237–58.

[39] See generally J. Lin, 'The Emergence of Transnational Environmental Law in the Anthropocene', in Kotzé, n. 30 above, pp. 329–52.

[40] E. Daly & James May (eds), *Implementing Environmental Constitutionalism: Current Global Challenges* (Cambridge University Press, 2018), p. 1.

[41] Ibid., p. 7.

availability and sustainable management of water and sanitation for all'.[42] The Organisation for Economic Cooperation and Development (OECD) has also been working on domestic prerequisites for sustainable water management, arguing that:

> [w]ell-designed allocation regimes contribute to multiple policy objectives: economic efficiency, by allocating resources to higher value uses as well as contributing to innovation and investment in water use efficiency; environmental performance by securing adequate flows to support ecosystems services; and equity by sharing the risks of shortage among water users fairly.[43]

The responses of governments to the pressures placed on the environmental qualities of rivers is sometimes to implement 'environmental flow' regimes in domestic regulatory frameworks for water.[44] Such regimes conceive of the environment as a legitimate 'user' of water,[45] including for 'ecosystem services',[46] defined by Arthington as 'the tangible benefits people gain from ecosystems'.[47] 'Environmental water' is a broad term, used to encompass both legal rights for the environment as a consumptive user and mechanisms that impose conditions on other users (such as an extraction cap). The term 'environmental flow', on the other hand, typically contemplates minimum in-stream flows or reserves which do not form part of the consumptive pool of water allocated for extractive use.[48] The Brisbane Declaration and Global Action Agenda on Environmental Flows of 2018 provides the following revised definition of environmental flows:[49]

> Environmental flows describe the quantity, timing, and quality of freshwater flows and levels necessary to sustain aquatic ecosystems which, in turn, support human cultures, economies, sustainable livelihoods, and well-being.

The structure and method of providing for environmental flows differs from place to place, with a range of possible technical approaches for calculating and regulating the appropriate flow. Arthington summarizes the typical approach to setting environmental flows as follows:

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[42] United Nations, *Sustainable Development Goal 6: Synthesis Report on Water and Sanitation* (2018) p. 10, available at: https://www.unwater.org/app/uploads/2018/12/SDG6_SynthesisReport2018_WaterandSanitation_04122018.pdf.

[43] OECD, *Water Resources Allocation: Policy Highlights – Sharing Risks and Opportunities* (2015), available at: https://www.oecd.org/environment/resources/Water-Resources-Allocation-Policy-Highlights-web.pdf.

[44] See generally Arthington, n. 13 above.

[45] J.A. Webb et al., 'Adaptive Management of Environmental Flows' (2018) 61(3) *Environmental Management*, pp. 339–46, at 339.

[46] L. Nahuelhual et al., 'Opportunities and Limits to Ecosystem Services Governance in Developing Countries and Indigenous Territories: The Case of Water Supply in Southern Chile' (2018) 86 *Environmental Science and Policy*, pp. 11–8, at 11.

[47] Arthington, n. 13 above, p. 15.

[48] Horne, O'Donnell & Tharme, n. 22 above, p. 361.

[49] 'The Brisbane Declaration and Global Action Agenda on Environmental Flows (2018)', 22nd International River Symposium, available at: https://riversymposium.com/about/brisbane-declaration.

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> The majority of 'in-stream flow' methods … either provide simple rules founded on the hydrologic characteristics of surface water flows, or they quantify the flow volumes needed to maintain aquatic habitat in terms of water depth, velocity, and cover for selected species, usually fish of commercial or recreational value (e.g., salmonids). Often the flow recommended to support habitat is a 'minimum flow,' the smallest amount of water that could maintain a wetted channel and provide opportunities for limited movement and maintenance feeding.[50]

Despite the Brisbane Declaration's recognition that environmental flows support human cultures, economies and wellbeing, conceptual models underpinning environmental flows, until very recently, have largely been restricted to biophysical interactions, 'eschewing socio-cultural complexity, local knowledge, and governance arrangements'.[51] Advocates of an expanded conception of environmental flows argue for recognition of local and Indigenous governance frameworks and interests to build legitimacy in environmental flow regimes and water planning more broadly.[52]

Human relationships with water hold particular importance for Indigenous communities, who claim distinct relationships with water resources and the broader natural world[53] and who are the repositories of valuable traditional knowledge on environmental protection.[54] Tobin explains that Indigenous rights to natural resources are 'vital for protection of their cultural integrity and their survival as distinct peoples'.[55] Typical of accounts of Indigenous relationships with natural resources, including in the Latin American context, is a closeness or familial interconnectedness between Indigenous cultures and nature, and an obligation to care for natural resources and ensure their survival for future generations, as opposed to typical western utilitarian accounts of nature as a commodity to be used.[56]

In Latin America, the rights that Indigenous peoples have over natural resources, including water, have been the subject of many significant decisions of the Inter-American Court of Human Rights, which emphasize the right of Indigenous peoples to communal property over their resources in confronting resource development and extraction.[57] These decisions often refer to the protection of Indigenous territorial

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[50] Arthington, n. 13 above, p. 19.

[51] M. Douglas et al., 'Conceptualizing Hydro-Socio-Ecological Relationships to Enable More Integrated and Inclusive Water Allocation Planning' (2019) 1(3) *One Earth*, pp. 361–73, 361. See also S. Jackson, 'How Much Water Does Culture Need?', in Horne et al., n. 22 above, pp. 173–87, at 185.

[52] E. O'Donnell & E. Macpherson, 'Challenges and Opportunities for Environmental Water Management in Chile: An Australian Perspective' (2012) 23(1) *Journal of Water Law*, pp. 24–36, at 24. See also Douglas et al., n. 51 above, p. 362; Arthington, n. 13 above, p. 232.

[53] See, e.g., B.A. Hendrix, 'Context, Equality, and Aboriginal Compensation Claims' (2011) 50(4) *Dialogue: Canadian Philosophical Review*, pp. 669–88, at 672.

[54] L. Collins, 'Judging the Anthropocene', in Kotzé, n. 30 above, pp. 309–28, at 323.

[55] B. Tobin, *Indigenous Peoples, Customary Law and Human Rights: Why Living Law Matters* (Routledge, 2014), p. 141.

[56] See, e.g., K. Bavikatte & T. Bennett, 'Community Stewardship: The Foundation of Biocultural Rights' (2015) 6(1) *Journal of Human Rights and the Environment*, pp. 7–29, at 7.

[57] Knox & Pejan, n. 37 above, p. 8. See, e.g., *Mayagna (Sumo) Awas Tingni Community* v. *Nicaragua*, Judgment, [2001] Inter-American Court of Human Rights (Ser. C) Case No. 79 (31 Aug. 2001); *Case of the Saramaka People* v. *Suriname*, Judgment (Preliminary Objections, Merits, Reparations and Costs), [2007] Inter-American Court of Human Rights (Ser. C) Case No. 172 (28 Nov. 2007).

rights to natural resources under the International Labour Organization (ILO) Convention 169 on the Rights of Indigenous and Tribal Peoples,[58] which a number of Latin American countries (including Chile) have ratified. ILO Convention 169 requires states to 'respect the special importance for the cultures and spiritual values of the peoples concerned of their relationship with the lands or territories',[59] to recognize the 'rights of ownership and possession' which Indigenous peoples have over their traditional territories',[60] and to safeguard the rights of Indigenous peoples to 'participate in the use, management and conservation of these resources'.[61]

In the Australian context, the concept of environmental flows has at times been interpreted by governments as encompassing a flow of water for Indigenous 'cultural' purposes, although some scholars have advocated the recognition of 'cultural flows' separate from environmental flow policies.[62] The Australian National Cultural Flows Project, for example, has attempted to 'secure a future where First Nations' water allocations are embedded within Australia's water planning and management regimes, to deliver cultural, spiritual and social benefits, as well as environmental and economic benefits, to Aboriginal communities'.[63] The project adopts the definition of cultural flows from the Echuca Declaration, as:

> water entitlements that are legally and beneficially owned by Indigenous Nations of a sufficient and adequate quantity and quality, to improve the spiritual, cultural, environmental, social and economic conditions of those Indigenous Nations. *This is our inherent right*. [64]

The idea of 'cultural flows' has emerged from Australia as an attempt by Indigenous communities to leverage government support of environmental flows for specific Indigenous interests,[65] and ensure that an adequate flow of the river is set aside for Indigenous values or uses in water planning. However, some scholars have criticized the cultural flows policy in Australia on the basis that the terminology of cultural flows has been seized by Australian governments as a way to subsume Indigenous water interests within existing environmental flow regimes without needing to confront the difficult question of redistribution.[66] Until recently, cultural flows have enjoyed little concrete action, in Australia or elsewhere, in terms of demarcating flows within a river or other waterway for Indigenous use. Those critical of cultural flows prefer to

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[58] Geneva (Switzerland), 27 June 1989, in force 5 Sept. 1991, available at: https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C169.

[59] Ibid., Art. 13.

[60] Ibid., Art. 14.

[61] Ibid., Art. 15.

[62] See generally S. Jackson & M. Langton, 'Trends in the Recognition of Indigenous Water Needs in Australian Water Reform: The Limitations of "Cultural" Entitlements in Achieving Water Equity', (2012) 22(2–3) *Journal of Water Law*, pp. 109–23, at 110.

[63] National Cultural Flows Research Project (2019), available at: http://culturalflows.com.au.

[64] Murray Lower Darling Rivers Indigenous Nations and Northern Murray-Darling Basin Aboriginal Nations, 'Echica Declaration', 19 May 2010, available at: http://www.culturalflows.com.au/images/documents/Echuca_declaration.pdf (emphasis in the original).

[65] Jackson, n. 23 above, p. 181.

[66] Jackson & Langton, n. 62 above, p. 110; see also Jackson, n. 23 above, p. 183.

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focus on the need for substantive water rights or allocations for Indigenous peoples to use water for any purpose they may wish, including commercial use.[67]

A recent article by Douglas and others helpfully emphasizes the diverse uses that Indigenous peoples make of rivers, and encourages water planning to account for a range of Indigenous water uses and values, including through environmental flow processes. The authors develop a 'hydro-socio-ecological conceptual model' for the impacts of water abstraction in the Australian context, which involves a complex interplay of social, cultural, and environmental dimensions.[68] The authors identify a 'need to recognize Indigenous and non-Indigenous governance and management systems at multiple scales to build legitimacy in e-flows and water planning' and 'propose guiding principles for using e-flows to protect aquatic ecosystems and their dependent human cultures and livelihoods'.[69]

For the reasons emphasized by Douglas and his co-authors, we consider that it is important that any environmental flow regime should contemplate setting aside a flow of a river for Indigenous interests, and meaningfully collaborate with Indigenous communities and institutions in environmental water management. This is especially important in the context of market-based allocation frameworks and strongly protected private use rights, where, without a specific flow allocation, Indigenous water use and management may be overridden by other users.[70] The idea of involving governance by Indigenous peoples and accounting for their rights in environmental flows should be considered complementary to, and should not come at the expense of, the need for consumptive rights for Indigenous peoples to take water for any (including commercial) purposes. As Jackson puts it:

> In the pursuit of opportunities to secure water for Indigenous use, instruments that deliver water to the environment could serve as model institutions through which to redress the historical neglect of Indigenous water rights and interests and the transparently inequitable distribution of water.[71]

3. CHILE: A COUNTRY OF RIVERS

Chile is a long and narrow country,[72] and water resources and demand are unequally distributed throughout its 101 water basins. Chile's hydrography presents particular challenges for water regulation, with varying climate and geography across the territory influencing various freshwater ecosystems in different ways. The Chilean economy depends on a reliable supply of water for water-intensive activities like agriculture, agroforestry, fisheries, and mining, which (when combined) total almost 70% of the

[67] See, e.g., E. Macpherson, 'Beyond Recognition: Lessons from Chile for Allocating Indigenous Water Rights in Australia' (2017) 40(3) *University of New South Wales Law Journal*, pp. 1130–69.

[68] Douglas et al., n. 51 above, p. 363.

[69] Ibid., p. 362.

[70] Macpherson, n. 15 above, pp. 221–40.

[71] Jackson, n. 23 above, p. 181.

[72] Chile's longitude is 4.329 km: Instituto Nacional de Estadisticas, available at: https://www.ine.cl/bases-de-datos.

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country's exports.[73] These activities present ever-increasing threats to the quality and the availability of water resources for environmental and social uses.[74]

In July 2016, the OECD released an Environmental Performance Review for Chile.[75] The report recognizes both the significance of many Chilean regions in terms of global biodiversity, and the intense pressure on natural resources exerted by Chile's extractive economy. Specifically, the OECD noted that freshwater ecosystems suffer from poor water quality and a large number of freshwater species are endangered.[76] Moreover, the actual state of many of Chile's rivers is unknown, as a result of the collection and maintenance of 'partial and unsystematic' information on the condition of aquatic ecosystems.[77]

Alongside the environmental degradation of Chile's water resources, Chile has experienced a growth in water-related social conflicts in recent years, between various user groups with differing water values and competing demands.[78] Bauer has helpfully characterized these conflicts into four basic types (paraphrased below):[79]

- river basin conflicts, particularly in central and southern Chile, involving multiple users of surface water, with hydropower often being the driving factor;
- conflicts about over-exploited groundwater systems, particularly in the north, driven by large-scale mining, agriculture, and urban growth;
- conflicts about social and environmental issues broader than water use, but in which water issues are central. These conflicts typically involve large mining projects in northern and central Chile, or large hydroelectric projects in the south;
- disputes that do not relate directly to conflicting water uses but are more directly political, driven by clashing views about the water law itself and its fundamental rules, principles, and ideology.

A review by the Chilean Human Rights Institute in 2018 established that out of 116 socio-environmental conflicts within the country, 38% relate to the energy productive

[73] The World Bank, 'International Bank for Reconstruction and Development: Project Appraisal Document on a Proposed Loan in the Amount of USD 40.89 Million to the Republic of Chile for the Integrated Water Resources Management and Infrastructure Development Project', Report No. PAD1275, 15 Oct. 2015, pp. 10–1.

[74] Babidge & Bolados, n. 6 above.

[75] OECD and Economic Commission for Latin America and the Caribbean, *Environmental Performance Reviews: Chile 2016* (OECD, 2016) (Environmental Performance Review). This report is the second Environmental Performance Review of Chile. It evaluates progress towards sustainable development and green growth, with a focus on climate change, biodiversity conservation and sustainable use.

[76] Ibid., pp. 61–2.

[77] F. Riestra, 'Environmental Flow Policy', in Donoso, n. 4 above, pp. 103–15, at 113.

[78] Marín, n. 15 above; A. García, 'Conflictos por el agua: el gran capital contra las comunidades locales. Análisis comparativo de las cuencas de los ríos Huasco (Desierto de Atacama) y Baker (Patagonia Austral') [Conflicts over Water in Chile: Big Capital versus Local Communities. A Comparative Analysis of the Huasco (Atacama Desert) and Baker (Austral Patagonia) River Basins] (2009) 18(4) *En foco: Medio Ambiente, Sociedad y Desarrollo Sustentable*, pp. 695–708.

[79] Bauer, n. 14 above, p. 154.

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sector and 28% to mining activities.[80] Specifically in relation to conflicts over water, a 2010 report by environmental non-governmental organization (NGO) Chile Sustentable reported 26 conflicts across the country.[81] According to this data, one out of 13 conflicts in the north is linked to mining projects; in the central region four out of six conflicts concern energy and hydropower developments; and in the southern region six out of seven have arisen from the construction of hydroelectric power stations.

There are a number of emblematic cases of Chile's water conflicts, which have taken place throughout the length of Chile. One of these concerns the Loa river basin in the north of Chile, where water extractions for mining have had the effect of displacing local Indigenous agriculture.[82] At the beginning of the 20th century, extraction of copper, lithium and other minerals began in the north of Chile, producing various adverse impacts on freshwater resources and local Indigenous communities.[83] After decades of mining expansion the condition of rivers in the north of Chile is considered critical, as groundwater resources have reached exhaustion, and some glaciers, high-altitude grasslands and wetlands have been irreversibly affected.[84]

Another well-known case is that of Petorca in the central region, where agricultural expansion has compounded the effects of drought, leading to the area being declared a 'scarcity zone',[85] and drinking water now needs to be regularly trucked into the area.[86] As a result of increasing water scarcity in northern and central Chile, private companies seek increasingly inventive ways to access water for their commercial activities, including developing major projects for the desalinization of seawater.[87]

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[80] Mapa de conflictos sociales en Chile [Map of Environmental Conflicts in Chile], available at: https://mapaconflictos.indh.cl.

[81] S. Larraín & C. Schaeffer (eds), *Conflicts over Water in Chile: Between Human Rights and Market Rules* (Chile Sustentable, 2010).

[82] See M. Calderón et al., 'Gran minería y localidades agrícolas en el Norte de Chile: comparación exploratoria de tres casos' [Large Mining and Agricultural Localities in Northern Chile: Exploratory Comparison of Three Cases] (2016) 48(2) *Chungará, Revista de Antropología Chilena*, pp. 295–305, at 298–9.

[83] Including the Aymara, Atacameñas, Collas, Diaguitas and Quechua: see Babidge, n. 12 above.

[84] See generally Babidge & Bolados, n. 6 above; Camacho, n. 6 above.

[85] By Oct. 2019 there were 14 *decretos de escasez hídrica* [water scarcity decrees] in 126 *comunas* (the smallest territorial unit in the administration of Chile) in the regions of Coquimbo, Valparaíso, Metropolitana, O'Higgins and del Maule: see DGA, 'Decretos declaración zona de escasez vigentes' [Decrees Declaring Current Areas of Water Scarcity], available at: http://www.dga.cl/administracionrecursoshidricos/decretosZonasEscasez/Paginas/default.aspx.

[86] J. Budds, 'La demanda, evaluación y asignación del agua en el contexto de escasez: un análisis del Ciclo Hidrosocial del Valle del Río La Ligua, Chile' [Demand, Evaluation and Management of Water in the Context of Scarcity: An Analysis of the Hidrosocial Cycle of the Valley of La Ligua River, Chile] (2012) 52 *Revista de Geografía Norte Grande*, pp. 167–84, at 173; P. Bolados et al., 'La eco-geo-política del agua: una propuesta desde los territorios en las luchas por la recuperación del agua en la Provincial de Petorca (Zona Central de Chile) [An Eco-Geo-Politic of Water: A Proposal from the Territories in the Struggles for the Reclamation of Water in Petorca Province (Central Zone of Chile)] (2018) 8(1) *Revista Rupturas*, pp. 159–91, at 167, 181. See also Bauer, n. 14 above, at 158.

[87] Servicio de Evaluación Ambiental, Sistema de evaluación de impacto ambiental [Environmental Impact Assessment System], available at: http://seia.sea.gob.cl/busqueda/buscarProyectoAction.php?nombre=desalinizadora; P. Cereceda, R.S. Schemenauer & R. Valencia, 'Posibilidades de abastecimiento de agua de niebla en la región de Antofagasta, Chile' [Possibilities of Supplying Water from Fog in the Region of Antofagasta, Chile] (1992) 19 *Revista de Geografía Norte Grande*, pp. 3–14, at 3.

In stark contrast to the dry and over-allocated north, the south of Chile experiences high levels of rainfall, thus enabling a greater surface recharge. The region also has lakes, rivers, snow and glaciers, which act as important water reserves, which means that the availability of water is higher than demand for it.[88] The socio-environmental conflicts in these regions have been linked historically to major hydropower development,[89] and the need to protect freshwater resources to maintain the state of free-flowing rivers.[90] One of the most controversial water conflicts in Chile's south concerned the (now discontinued)[91] Hydroaysen megaproject:[92] a 2,750-megawatt hydroelectric power development project comprising five dams in Patagonia – three on the Pascua river, and two on the Baker river.[93] Conflict between developers and the government on one side and local communities and environmental activists on the other divided the country between those who believed that the Hydroaysen was necessary for Chile's energy security and those who saw freshwater resources as Chile's most important asset to be protected for present and future generations.

Throughout Chile, concern about the adequate protection and fair distribution of water continues, in the context of increasing pressure on water from industry (typically mining and hydroelectric development), irrigated agriculture, and urbanization. Concerns about the state of Chile's water resources and the impact of development have also been voiced by Indigenous communities, including through resistance to water bottling operations and mining megaprojects in the north, and hydroelectricity developments in the south.[94] Examples of this are the Pehuenche-Mapuche Indigenous opposition to the Ralco dam development in the south of Chile,[95] and resistance to the Pascua Lama gold mining project by the Diaguita Huascoaltino Indigenous communities of northern Chile.[96]

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88 Valdés-Pineda et al., n. 3 above.

89 For an analysis of the interaction of water and energy law frameworks in Chile see Bauer, n. 6 above.

90 See Bauer, n. 14 above, p. 159; D. Tecklin, C. Bauer & M. Prieto, 'Making Environmental Law for the Market: The Emergence, Character, and Implications of Chile's Environmental Regime' (2011) 20(6) *Environmental Politics*, pp. 879–98.

91 Enel Chile S.A., 'Annual Report: Enel Chile 2017', available at: https://www.enel.cl/content/dam/enel-cl/en/investors/enel-chile/reports/annual-reports/2017/Annual-Report_Enel-Chile_2017.pdf.

92 See generally A. Berrizbeitia & T. Folch, 'Colonizar las últimas fronteras: el potencial de los paisajes de energyía en la Patagonia chilena' [Colonizing the Last Frontier: The Potential of Energy Landscapes in Chilean Patagonia], *ARQ (Santiago)*, 2015, pp. 22–9.The Second Environmental Tribunal upheld the decision of the Environmental Impact Assessment Service not to approve the environmental impact evaluation: see *Daniel Fernández Koprich on behalf of Centrales Hidroeléctricas de Aysén S.A.* v. *Director Ejecutivo del Servicio de Evaluación Ambiental*, Second Environmental Tribunal, R-40-2014 (31 Oct. 2017).

93 Chile's largest river by volume of water: Instituto Nacional de Estadisticas, available at: https://www.ine.cl.

94 See D. Lovera, 'Indigenous Peoples and the Sale of Water Rights: The Case of Chile', in Langford & Russell, n. 29 above, pp. 84–112.

95 See L. Barrera-Hernández, 'Indigenous Peoples, Human Rights and Natural Resource Development: Chile's Mapuche Peoples and the Right to Water' (2005) 11(1) *Annual Survey of International & Comparative Law*, pp. 1–28. See also Davis, n. 15 above, p. 8.

96 See G. Aguilar Cavallo, 'Pascua Lama, Human Rights and Indigenous Peoples: A Chilean Case Through the Lens of International Law' (2013) 5(1) *Göttingen Journal of International Law*, pp. 215–49, at 215, 245–6; R. Fuentes, 'No se toman en cuenta los actos positivos de la empresa: la defensa de Pascua Lama para evitar su cierre' [The Positive Actions of the Company Are Not Taken into Account: The Defense of

Looking to the future, Chile is highly vulnerable to the impacts of climate change, and the Ministry of Agriculture has acknowledged that Chile's main challenge in terms of climate change mitigation, adaptation and resilience concerns the use and management of freshwater resources.[97] The latest data from the World Resources Institute places Chile at 18th among the world's countries under water stress, with a 'high baseline of water stress',[98] a situation exacerbated by the effects of climate change.

Water in Chile, as in many other countries, is subject to increasing conflict, as the status of water rights as private 'property', and the lack of institutional capacity or willingness to regulate its use, undermine the potential for the transformative change needed to secure the protection of freshwater resources for present and future generations. In this context, and in the light of increasing concern about additional pressures to be placed on Chile's water resources through climate change, there is a need for robust and comprehensive water planning to protect environmental and cultural interests.

4. ENVIRONMENTAL FLOWS IN CHILE: THE LEGAL FRAMEWORK

4.1. *The Legal Framework for Water*

Since the time of Spanish colonization, Chile's political and social history has been characterized by ideological extremes and constitutional contrasts, which have included socialist governments focused on progressive social reform from the late 1960s and a conservative (and later neoliberal) military dictatorship from 1973 until 1990. Throughout Chile's history the allocation and exercise of rights to use water and the power of governments to regulate that use have been contentious constitutional matters, symptomatic of broader societal divisions about the role of the market and the public interest.[99]

Pascua Lama to Prevent Its Closure], *Radio Universidad de Chile*, 24 July 2019, available at: https://radio.uchile.cl/2019/07/24/no-se-toman-en-cuenta-los-actos-positivos-de-la-empresa-la-defensa-de-pascua-lama-para-evitar-su-cierre. See generally P.A. Haslam, 'The Two Sides of Pascua Lama: Social Protest, Institutional Responses, and Feedback Loops' (2018) 106 *European Review of Latin American and Caribbean Studies*, pp. 163–88. The Environmental Authority (Superintendency of Environment) ordered the permanent closure of the Project Pascua Lama, from the Mining Company Barrick Gold, based on an analysis of 33 claims, which included impacts on protected flora and fauna, incomplete monitoring of glaciers and discharge of 'acidic fluids' into a river, causing permanent environmental damage.

97 F. Santibáñez, *El cambio climático y los recursos hídricos de Chile: la transición hacia la gestión del agua en los nuevo escenarios climático de Chile* [Climate Change and Freshwater Resources of Chile: The Transition to Water Management in the New Climatic Scenarios of Chile] (Ministerio de Agricultura, 2016), p. 52.

98 R.W. Hofste, P. Reig & L. Schleifer, '17 Countries, Home to One-Quarter of the World's Population, Face Extremely High Water Stress', *World Resources Institute*, 6 Aug. 2019), available at: https://www.wri.org/blog/2019/08/17-countries-home-one-quarter-world-population-face-extremely-high-water-stress.

99 For a full discussion of the legal, political and social historical context of Chilean water law see the seminal work of C.J. Bauer, *Siren Song: Chilean Water Law as a Model for International Reform* (Resources for the Future, 2004). For a discussion of the colonial origins of Chilean water law see A. Vergara Blanco, 'Contribución a la historia del derecho de aguas: fuentes y principios del derecho de aguas Chileno contemporáneo (1818–1981)' [Contribution to the History of Water Law: Sources and Principles of Contemporary Chilean Water Law (1818–1981)] (1989) 1 *Revista de Derecho de Minas y Aguas*, pp. 111–45, at 118.

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Chilean water law frameworks were overhauled during the dictatorship, as part of a wider project of neoliberal reform implemented by the military regime across a range of sectors,[100] and accompanied by rapid growth in water-related development such as mining and hydroelectricity.[101] The new approach to water regulation, enshrined in a new Water Code of 1981, combined centralized water regulation with trade in water rights (*derechos de aprovechamiento*), which could be transferred independently of land ownership in water markets.

Under the Water Code, and in Chile's established constitutional framework, waters are '*bienes nacionales de uso publico*' [national property for public use].[102] However, the same declaration of water as public property allows the government to grant rights to use water, which amount to (constitutionally protected) private property,[103] equivalent to rights of absolute ownership.[104] In fact, water rights enjoy the strongest form of property right available under Chilean law,[105] described as an absolute, exclusive, and perpetual right to use, enjoy and dispose of a thing.[106] The status of water rights differs greatly from rights over other resources in comparative Chilean concessional regimes,[107] as water rights are granted in perpetuity, without cost.

Constitutionally protected water rights may either be 'created' or 'recognized' by law. Water rights are 'created' where new rights are allocated to users by the Dirección General de Aguas [General Water Directorate] (DGA) under the Water Code by way of an administrative concession, provided that the applicant satisfies a number of formal and substantive requirements,[108] which include proving the 'availability of the resource'.[109] They may also be 'recognized', either based on historical titles or via the judicial process of regularization, which requires applicants to prove uninterrupted productive use[110] of the water since five years before the commencement of the Water Code (that is, since 1976), 'without force or illegality' and 'without recognizing the rights of others',[111] in a process similar to the doctrine of adverse possession at common law.[112] The regularization process was intended originally to be a

[100] Marín, n. 15 above, p. 88.

[101] See generally Bauer, n. 99 above, p. 4; C.J. Bauer, *Against the Current: Privatization, Water Markets, and the State in Chile* (Springer, 1998).

[102] Código de Aguas [Water Code] 1981, Art. 5.

[103] Constitución Política de la República de Chile [Political Constitution of the Republic of Chile] 1980 (Constitution), Art. 19(24).

[104] For the incidents of ownership (*propiedad*) in Chilean civil law see Código Civil de la República de Chile [Civil Code of the Republic of Chile] 1855 (Civil Code, Chile), Art. 589(2).

[105] Ibid., Art. 577.

[106] Ibid., Art. 582.

[107] E.g., aquaculture, maritime, public works and sanitary concessions apply only for a limited period, usually involve a fee, and are subject to more regulatory control.

[108] Water Code, n. 102 above, Art. 20. See generally A. Vergara, *Derecho de aguas* [Water Law] (Editorial Jurídica de Chile, 1998) Vol II, p. 321.

[109] Water Code, n. 102 above, Art. 141.

[110] Decree Law 2.603 (1979).

[111] Water Code, n. 102 above, transitional Art. 2.

[112] The Chilean courts have applied the process of regularization in conjunction with Art. 7 of Decree Law 2.603 (1979), which deemed the person making '*uso efectivo*', or 'productive use', of a water right to be

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transitional measure to support the setting up of a complete water register necessary to encourage water markets after the enactment of the 1981 Water Code; however, regularization cases have continued. In parts of Chile, the regularization process has been used to recognize the customary water rights of Indigenous communities as well as ongoing use by other historical users, and to register their water rights;[113] this presents particular challenges for forward water-related planning. Finally, water rights that have already been allocated may be purchased from other users by private bargaining in water markets.

Water use rights are merely classified as 'consumptive' or 'non-consumptive',[114] with no priorities for various uses, such as human consumption, environmental interests, or cultural uses. Until 2005 applicants for new water rights were not required to specify their intended use of water. Following an amendment in 2005, Articles 131 and 132 of the Water Code require the applicant to explain the proposed use for applications above a certain flow, although the proposed use is not binding. In any event, in order to facilitate water markets, water users may change their use of water at any time – for example, from small-scale agriculture to mining, or from ecotourism to hydro generation – although, like market transfers, such changes in use are understood to be rare in practice.[115]

The status of freshwater resources as 'national goods for public use' has typically been construed to mean that, rather than being owned directly, they are allocated by the government pursuant to a concessional regime for their use and management.[116] However, the DGA has few regulatory powers for water, and it exercises those powers sparingly.[117] The model empowers private water user associations to 'manage and distribute' the various water rights in natural rivers at basin or semi-basin level in corporate organizations known as *Juntas de Vigilancia* [Water Monitoring Boards].[118] The Boards have 'wide powers under the Water Code to monitor and manage the rivers within their control, including ensuring efficient water rights distribution, and protective and remedial measures to protect river health'.[119] According to Rojas Calderón,

its owner: see, e.g., *Comunidad Atacamena Toconce con Essan SA* [2004] Corte Suprema [Supreme Court] No. 4064-2004 (Chile), p. 6 (*Toconce*).

[113] See generally Macpherson, n. 15 above, pp. 176–200. See also F. Agüero et al., 'Diagnóstico de dificultades legal y reglamentarias relativas al catastro público de aguas' [Diagnosis of the Legal and Regulatory Challenges related to the Public Water Cadastre], Report No. 28, Centro de Regulación y Competencia, Universidad de Chile, 29 July 2013, p. 44.

[114] Water Code, n. 102 above, Arts 12, 13. A 'consumptive' water right allows its holder to totally consume the waters in any activity.

[115] See C.J. Bauer, 'Bringing Water Markets Down to Earth: The Political Economy of Water Rights in Chile, 1976–95' (1997) 25(5) *Journal of World Development*, pp. 639–56, at 652 (although, with the incomplete record keeping with regard to water rights in Chile, these may be under-reported).

[116] A. Vergara & D. Rivera, 'Legal Institutional Frameworks of Water Resources', in Donoso, n. 4 above, pp. 67–85, at 69–70.

[117] Bauer, n. 99 above.

[118] Water Code, n. 102 above, Art. 268. There are also 'canal user associations' for canalized rivers.

[119] For further discussion on the Boards and environmental water management see E. O'Donnell & E. Macpherson, 'Voice, Power and Legitimacy: The Role of the Legal Person in River Management in New Zealand, Chile and Australia' (2019) 23(1) *Australasian Journal of Water Resources*, pp. 35–44, at 39.

these private Boards have the 'public' function of managing river distribution and health across the whole catchment,[120] and Vergara Blanco argues that they have general powers for the governance and conservation of rivers,[121] although, as corporate entities accountable to private users as shareholders, it is doubtful that this public interest overrides any private benefit in the Boards' decision-making process.[122]

According to Bauer, weak capacity for water governance under the Chilean model has been 'built into the institutional framework, which had been built primarily to protect private property rights and to allow free market transactions without government interference'.[123] There is also a particular productivist logic to the government's minimalist approach to regulation, which emphasizes economic efficiency at the expense of environmental, social or cultural outcomes. Nahuelhual and others explain that the predominant view within Chile's 'weak' institutional framework for water is that 'water is a natural resource disconnected from other components of the socio-ecological system'.[124] The administrative focus is on access to water and its most efficient use, while 'no formal rules regard the protection of forests or watershed heads as key ecosystems to maintain water provision and regulation'.[125]

4.2. *Minimum Flows under the Water Code and Environmental Law*

The 1981 Water Code did not contemplate the environmental implications of the management of water and the protection of freshwater ecosystems. When the system of water regulation under the Water Code was established, there was no specific allocation of water to the environment and no reference to environmental flows.[126] This was despite the fact that Chile's Constitution protects:

> [t]he right to live in an environment free of contamination. It is the obligation of the State to ensure that this right is not affected and to uphold the preservation of nature.

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[120] C. Rojas Calderón, 'Autogestión y autorregulación regulada de las aguas: Organizaciones de Usuario de Aguas (OUA) y Juntas de Vigilancia de Ríos' [Water Self-Management and Self-Regulation: Water User Associations] (2014) 20(1) *Ius et Praxis*, pp. 123–62, at 123.

[121] A. Vergara Blanco, 'Autogobierno en la gestión de las aguas en Chile' [Self-Governance in Chilean Water Management], in A. Guevara Gil & A. Verona (eds), *El derecho frente a la crisis del agua en el Perú: Primeras Jornadas de Derecho de Aguas* [The Law Confronting the Water Crisis in Peru: First Water Law Conference] (Centro de Investigación, Capacitación y Asesoría Jurídica de la PUCP, 2014), pp. 195–209, at 195

[122] M. Prieto & C. Bauer, 'Hydroelectric Power Generation in Chile: An Institutional Critique of the Neutrality of Market Mechanisms' (2012) 37(2) *Water International*, pp. 131–46; O'Donnell & Macpherson, n. 119 above, p. 40.

[123] Bauer, n. 14 above, p. 149; but see Prieto, n. 12 above (Prieto argues, based on extensive field work in Chile's Atacama region, that the government, rather than the market, has been instrumental in water rights transfers in that region).

[124] Nahuelhual et al., n. 46 above, p. 16.

[125] Ibid., p. 16.

[126] Environmental concerns were only introduced into Chile's water law frameworks indirectly, with the passage of Ley No. 19.300 sobre Bases Generales de Medio Ambiente [Law 19.300 on General Environmental Standards] 1994 (Chile) (Environmental Law), discussed below. This created a legal framework to support the constitutional right to a clean and healthy environment, and introduced the first legal mechanisms intended to protect the country's natural resources.

> The law may establish specific restrictions on certain rights or freedoms in order to protect the environment.[127]

The constitutional protection of environmental rights has been interpreted in Chilean scholarship as requiring the state to react appropriately to activities that undermine the preservation of nature,[128] and take action before any infringement, thus enshrining a precautionary approach in Chilean environmental law.[129]

The lack of an express legislative requirement for minimum ecological flows did not preclude their establishment, and the DGA began to create them for specific projects or activities in as early as 1982,[130] with different criteria applied depending on the area to be protected or the characteristics of the case.[131] Until 1993 there were up to ten projects involving environmental flow rates established each year in the central and southern regions of Chile, which specified a minimum amount of water that may not be extracted from the river by the holder of the water right. However, the practice of applying minimum ecological flows operated in a discretionary and unsystematic way.[132]

In the absence of an express provision, the DGA relied on a number of regulatory powers with regard to water as implied authority to establish the first minimum flows. These included, foremost, the constitutional right to a clean and healthy environment. The DGA also took authority from the public interest in water management, given the status of waters as *bienes nacionales de uso público* [national property for public use] under the Water Code and Civil Code.[133] The DGA has taken further mandate from its powers under Articles 299(a) and 300(a) of the Water Code (to plan the development of freshwater resources, implement necessary measures to prevent and avoid the exhaustion of aquifers, and regulate to ensure the correct application of the law) to authorize a general regulatory role for environmental water. However, again, the environmental flows have been applied in a discretionary and ad hoc manner.

The DGA ordered the first Chilean study on environmental flows in 1993,[134] which provided some information about the ecological state of rivers in certain regions. The study proposed 'reasonable limits' on the extraction of freshwater resources in those rivers, applying various legislative requirements and methodologies. However, it did not prescribe a specific methodology on how to determine minimum environmental

[127] Constitution, n. 103 above, Art. 19(8).

[128] L. Püschel, *Deberes constitucionales estatales en materia ambiental* [State Constitutional Duties in Environmental Matters] (Legal Publishing, 2010), p. 137.

[129] L. Galdamez, 'Medio ambiente, constitución y tratados en Chile' [Environment, Constitution and Treaties in Chile] (2017) 148 *Boletín Mexicano de Derecho Comparado*, pp. 113–44, at 113, 124.

[130] Riestra, n. 77 above, p. 106.

[131] E.g., General Water Directorate Resolution No. 63 established a minimum ecological flow of 1.4 cubic metres per second (m^3/s) in order to avoid the disappearance of the waterfall 'Salto del Itata', the alteration of the ecological conditions of the place, and to preserve the tourism potential.

[132] Riestra, n. 77 above, pp. 103, 107.

[133] See generally Vergara & Rivera, n. 116 above, pp. 69–70.

[134] R&Q Ingeniería, 'Caudales ecológicos en regiones IV, V y Metropolitana. Encomendado por: Departamento de Conservación y Protección de Recursos Hídricos. Dirección General de Aguas' [Environmental Flows in the IV, V, and Metropolitan Region. Study ordered by the Department of Conservation and Protection of Freshwater Resources. General Water Directorate] 1993.

flows. Rather, it stated that the choice of specific method and technology will depend on the circumstances of the case.[135]

The power of the DGA to establish minimum ecological flows has been variously challenged in the courts, on the basis that no express positive law provides for it. Two well-known cases involve the Maipo river basin in Chile's central region, where a technical report commissioned by the DGA in May 2003 concluded that no new water rights should be created in the three sections of the Maipo river and recommended the establishment of minimum ecological flows.[136]

The first of these cases was the 2005 Supreme Court *casación en el fondo* (similar to judicial review in the common law sense) of *Aguas Chacabuco* v. *Dirección General de Aguas*.[137] The case concerned an application by a private company (Aguas Chacabuco S.A.) for consumptive water rights to take and use water from a wetland near Santiago. The DGA had denied the request on the basis that the May 2003 study confirmed that there was insufficient water in the Maipo basin for the grant of new water rights. The company argued that the DGA had no power to refuse the application, as the applicant had satisfied all requirements of the Water Code and, in particular, that the DGA had no power to take into account minimum ecological flows when determining whether there was 'availability of the resource' as required by Article 141 of the Water Code. The Supreme Court confirmed the power of the DGA to refuse the application for a water right, as there was insufficient water available for the right to be granted.[138] In doing so, the Court emphasized the right to a clean and healthy environment in Article 19(8) of the Constitution,[139] and pointed to the requirement for public authorities to protect conservation and biodiversity in Articles 41 and 42 of the Environmental Law, as well as a general and inherent power for the DGA to set aside minimum flows under the Water Code.[140]

The second case was the 2006 Supreme Court decision *Olga Prieto Poklepovic* v. *Dirección General de Aguas*,[141] which concerned an application for the right to take and use water from the Mapocho River, a tributary of the Maipo. Based on the May 2003 technical report, the DGA had denied the application on the basis of insufficient water being available. The Court, for the same reasons given in the *Chacabuco* case, affirmed the power of the DGA to deny the application and maintain minimum ecological flows, explaining:

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[135] Ibid., p. 124.

[136] DGA, 'Evaluacion de los recursos hídricos superficiales en la cuenca del Rio Maipo', informe tecnico realizado por Departamento de Administracion de Recursos Hidricos [Evaluation of Superficial Freshwater Resources in the Waterbasin of the Maipo River', Report developed by the Department of Management of Freshwater Resources], Report S.D.T No. 145, May 2003.

[137] *Aguas Chacabuco S.A.* v. *Dirección General de Aguas*, Supreme Court, Rol: 4224-2004 (31 Oct. 2005) (Chile).

[138] Ibid., para. 4 (referring to the requirement in Art. 141 of the Water Code that there exist sufficient availability of the resource for the grant of new water rights).

[139] Ibid., para. 6.

[140] Ibid., para. 8.

[141] *Olga Prieto Poklepovic* v. *Dirección General de Aguas*, Supreme Court, Rol: 4370-0425 (25 July 2006) (Chile).

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> [I]n determining whether or not there is availability of a water resource, the General Water Directorate is not only empowered to consider the existence of ecological flows at the moment of establishing whether or not there is availability of the resource, rather it is obligated to do so, given that it must respect what is established by the Environmental Law, which accords with article 22 of the Water Code …. All of the above follows from the quality of waters as national property of public use, according to article 5 of the Water Code together with articles 589 and 595 of the Civil Code, which means that their ownership and use belongs to all the nation. The State, being responsible for their administration, must ensure that [water] is permanently destined for the common use.[142]

Minimum flows have also been established under the 1994 Environmental Law (here referred to as 'environmental flows' to distinguish them from minimum ecological flows set by the DGA).[143] Article 41 of the Environmental Law established that natural renewable resources (which, for the purposes of the Law, include water) must 'be used in a way that ensures their potential to regenerate and their associated biological diversity'.[144] Article 42 goes on to require the Ministry for the Environment and all public bodies involved in the regulation of natural resource use to secure their conservation, referring specifically to the maintenance of water flows and the conservation of their beds. The Environmental Law also introduced the main regulatory instruments now available for water quality management, which include environmental water quality standards, emission standards, decontamination plans and strategies, and environmental impact assessments for new projects or activities.[145]

Under the Environmental Law, environmental flows have at times been set on a case-by-case basis as part of the environmental impact assessment process for major projects established under the Law. The Sistema de Evaluación de Impacto Ambiental [Environmental Impact Assessment System] is a procedure designed to assess the environmental impact of development projects or activities that need a permit to operate (an environmental qualification resolution, or RCA).[146] If the project or activity includes one or more of the activities set out in Article 10 of the Environmental Law, an *estudio de impacto ambiental* [environmental impact assessment] is required.

If the project will produce one or more of the impacts set out in Article 11 of the Environmental Law and, specifically, could impact on freshwater resources, the Environmental Impact Assessment Service is authorized to set minimum environmental flows, as mitigation measures.[147] For example, in the hydroelectric project Perquilauquén, in the Biobío region, the Service established minimum environmental flows and additional water rights (0.109 cubic metres per second (m^3/s)) which the company will have to leave in-stream for other downstream users (a '*caudal*

[142] Ibid., para. 12.
[143] Environmental Law, n. 126 above.
[144] Ibid., Art. 41.
[145] Ibid., Arts 10 and 11.
[146] Ibid., Art. 10.
[147] The project developer may also undertake to establish minimum environmental flows as a voluntary commitment.

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pasante').[148] Since 2016, the Service has operated under a specific guideline for setting environmental flows for hydroelectric projects,[149] which adopts the 2007 Brisbane Declaration definition of environmental flows, and incorporates an 'integral vision of the water system' incorporating human uses of the system, distinct from the minimum ecological flows set by the DGA, which are based only on hydrological criteria.[150]

The power of the Service to institute minimum environmental flows has been criticized on the basis that it duplicates the functions of two separate government institutions and creates ambiguity around the nature and scope of environmental flows.[151] In practice, however, the Service has rarely departed from the approach for setting proposed minimum ecological flows recommended by the DGA.[152] At the same time, the Service is not legally bound by the current limits imposed by the DGA for minimum ecological flows,[153] and the Service could in fact enhance the protection of freshwater resources, by taking into account other elements that might not be considered as part of the DGA's methodology in determining minimum environmental flows.

Since 1994 the DGA has systematically applied minimum ecological flows when granting new water rights. Its approach has been to set a minimum environmental reserve for surface watercourses, and grant future applications for water rights only for flows above this level.[154] In 2002 the Directorate passed a regulation – the Manual of Regulation and Procedures for the Management of Freshwater Resources – to provide detailed guidelines on the setting of environmental flows, including a hydrological method for determining minimum ecological flows.[155] The method typically requires a minimum ecological flow of 10% of the annual average flow and 50% of the minimum dry season flow across the 95th percentile of years.

In 2005, after 13 years of debate before the Parliament, a reform of the Water Code was finally passed (Law No. 20.017).[156] The amendment was hard won, with pro-market right-wing interests in fierce opposition to left-wing proponents of more

[148] República de Chile, Servicio de Evaluación Ambiental, 'Califica ambientalmente el proyecto "Proyecto Central Hidroeléctrica de Pasada Perquilauquén"' [Environmental Assessment for the 'Perquilauquén Pass Hydroelectric Centre Project'] (0851/2014, Santiago (Chile), 26 Sept. 2014, available at: https://infofirma.sea.gob.cl/DocumentosSEA/MostrarDocumento?docId=f9/84/d9c54c9f3f06ad7fd6634fa9e2f2bfb355ec.

[149] Servicio de Evaluación Ambiental, 'Guía metodológica para determinar el caudal ambiental para centrales hidroeléctricas en el SEIA' [Methodological Guide for Determining Environmental Flows for Hydroelectric Centres], 2016.

[150] Ibid., para. 1.3. For further explanation of the approach taken by the Service see para. 2.1.1.

[151] P. Jaeger, 'Caudales ecológicos mínimos y proyectos hidroeléctricos' [Minimum Ecological Flows and Hydroelectric Projects], in *Acta de las V jornadas de derecho ambiental* [Journal of the Fifth Environmental Law Conference] (Universidad de Chile, 2010), pp. 219–30, at 219.

[152] See, e.g., Project Reservoir Illapel 1999, Project Reservoir Corrales 1998, Project Convento Viejo Etapa II 2004, Project Hydroelectric Power Station Higuera 2004, Project Hydroelectric Power Station Quilleco 1998, and Project Hydroelectric Power Station Lago Atravesado 1998, in Endesa Chile, *Introducción al cálculo de caudales ecológicos: un análisis de las tendencias actuales* [Introduction to the Calculation of Ecological Flows: An Analysis of Current Trends] (Derechos Reservados, 2011), available at: http://observatoriaigua.uib.es/repositori/gf_caudales_calculo.pdf.

[153] Which is typically 20% of the average annual flow rate in the corresponding watercourse.

[154] Riestra, n. 77 above, pp. 103, 108.

[155] DGA, Resolución Exenta DGA No. 1503, 31 May 2002. The Resolution approves the 'Manual for the Norms and Procedures for the Administration of Water Resources'.

[156] There had been a minor amendment to the Water Code in 1992, discussed below.

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interventionist reforms.[157] Without altering the neoliberal ideology behind the Water Code, the 2005 amendment formally introduced a requirement to set minimum ecological flows in the process of granting new water rights, confirming the loose practice that the DGA had followed since 1982. New Article 129 *bis* 1 of the Water Code provided that:

> [i]n granting water rights, the General Water Directorate should ensure nature's preservation and environmental protection, establishing to that end a minimum ecological flow, which will only affect newly granted water rights, and should also consider the relevant natural conditions for each surface source.

The amendment did not provide a definition of 'minimum ecological flow', but provided that they may not amount to more than 20% of the average annual flow rate in the corresponding watercourse.[158] The amendment also provided an exception allowing the President of the Republic, following a favourable report from the Ministry of Environment, to issue a decree specifying a different minimum ecological flow, which could be higher than the legal limit of 20%, but less than 40% of the average annual flow rate in the corresponding watercourse.[159]

The legislation did not provide a methodology or procedure for calculating minimum ecological flows, and therefore did not provide any reason to depart from the criteria previously used by the DGA (in the 2002 Manual). However, in 2008 the DGA approved a new Manual for the Management of Freshwater Resources, which introduced a new rule that changing the point of capture of water under an existing water right would be treated as establishing a new water right, allowing the DGA to apply a minimum ecological flow. The DGA did so by applying a broad interpretation of Article 163 of the Water Code, which provides that approval is required to change the location of a water collection or extraction point. This interpretation was controversial and has been challenged more than once in court.[160] However, the Supreme Court, in the 2012 case of *Sergio Menichetti Cuevas* v. *Dirección General de Aguas*, agreed with the approach taken by the DGA in setting minimum ecological flows in relation to a request for a change of capture point, and emphasized the important role the DGA should play in protecting freshwater resources:

> This is a restriction that, moreover, is the obligation of the authority, in order to give effect to article 41 of the Environmental Law, which provides that the use and enjoyment of renewable natural resources must be carried out in a way that ensures their capacity for regeneration and the biological diversity associated with them. This is particularly important in the case of species that are at risk of extinction, vulnerable, rare or insufficiently

[157] See generally C.J. Bauer, 'In the Image of the Market: The Chilean Model of Water Resource Management' (2005) 3(3) *International Journal of Water*, pp. 146–65.

[158] Water Code, n. 102 above, Art. 129 *bis* 1, para 2.

[159] Ibid., Art. 129 *bis* 1, final para.

[160] See generally C. Boettiger, 'Caudal ecológico o mínimo: regulación, críticas y desafíos' [Ecological or Minimal Flow, Regulation, Critics and Challenges] (2013) 3 *Actas de Derecho de Aguas*, pp. 1–12; A. Vergara, 'Estatuto jurídico de la fijación de caudales mínimos o ecológico' [Legal Regime for Determining Minimum Ecological Flows] (1999) 1(1) *Revista de Derecho Administrativo Económico*, pp. 127–34, at 127.

> understood, and is required to be followed by all public services concerned with the maintenance of environmental flows and the conservation of their beds.[161]

Despite the developing regulatory framework in Chile to protect environmental flows, there is still strong resistance from industry and commercial sectors to the application of minimum flows to pre-existing water rights, as well as inadequate exercise of regulatory power by the DGA.[162] Opponents of environmental flows fiercely defend their constitutionally protected private property rights to water, in direct opposition to the constitutionally mandated responsibility and power of the state to protect freshwater ecosystems.[163] Given that most river basins in the north and central parts of Chile were fully allocated, and in some cases over-allocated,[164] since before the 2005 reform and in some cases since before the commencement of the Water Code, the potential reach of minimum ecological flows for the grant of new water rights is significantly limited.[165]

Another amendment introduced by the 2005 water reforms had the perverse outcome of disincentivizing the protection of environmental water in-stream. This was the introduction of annual taxes for instances of non-use of water rights,[166] designed to protect against water speculation and ensure that parties who hold the rights make use of them for their stated purpose.[167] 'Non-use' is assumed where water capture works are absent,[168] such as canals or irrigation systems, and a number of provisions in the Water Code set out the process for charging the taxes. In respect of non-consumptive water rights the Water Code provides an exception for small, localized volumes of less than 100 litres per second in the drier regions in northern Chile and the Metropolitan Region or 500 litres per second in regions south of Santiago.[169] However, as a general matter, if someone wanted to 'not use' their water rights for productive purposes and instead leave them in-stream for conservation purposes, and therefore could not point to the necessary water infrastructure, they would be required to pay fines under the legislation. 'Fees for non-use' have been challenged in the courts, generally by those seeking exceptions or the expansion of existing exception categories,[170] including in the case of Indigenous communities under the Indigenous Law, discussed below.

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[161] *Sergio Menichetti Cuevas* v. *Dirección General de Aguas*, Supreme Court, Rol: 9.654-2009 (24 May 2012), [11].

[162] See generally Bauer, n. 14 above.

[163] For evidence of this in Parliamentary debates see, e.g., 'Project to Reform the Water Code', Bulletin No. 7543-13, available at: https://www.senado.cl/appsenado/templates/tramitacion/index.php.

[164] J. Budds, 'Power, Nature and Neoliberalism: The Political Ecology of Water in Chile' (2004) 25(3) *Singapore Journal of Tropical Geography*, pp. 322–42, at 342 (stating that surface water rights in Chile reached 'exhaustion' in the mid-1990s).

[165] See also Riestra, n. 77 above, p. 103.

[166] Water Code, n. 102 above, Art. 129 *bis* 4.

[167] See Biblioteca del Congreso Nacional, 'Historia de la Ley N° 20.017 modifica el Codigo de Aguas' [History of Law 20.017 to Amend the Water Code], 16 June 2005, available at: https://www.bcn.cl/historiadelaley/nc/historia-de-la-ley/5838 (including the original reform proposal and parliamentary debates discussing the intent of the taxes).

[168] Water Code, n. 102 above, Art. 129 *bis* 9.

[169] Ibid., Art. 129 *bis* 4.

[170] See generally D. Rivera & A. Vergara, 'Derechos de aguas, Comentario de la Jurisprudencia de la Corte Suprema 2011–2014. Patente por non uso de aguas: aplicación práctica y conflictos interpretativos'

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Where minimum flows can be established, there are several other matters that significantly undermine their potential to protect or restore aquatic ecosystems. The first of these is a lack of adequate information about the state of particular waterways and their various uses (discussed above), making it very difficult for the DGA or Service to accurately set or maintain appropriate levels for minimum flows. In order to manage and protect freshwater resources, regulatory institutions must have accurate information about the state of water resources and an understanding of the number of rights holders, the nature of their rights, and the number of users extracting water from a river without any permit (or at least a mechanism to penalize unlawful use). However, the DGA has incomplete data on the actual state of waterways or their users in Chile. This is for a number of reasons.

Firstly, as mentioned above, water rights can come into being not only via administrative grant, but also where recognized by the courts in the process of regularization, which may recognize 'historical' water users retrospectively as legitimate rights holders, without any prior accounting. Secondly, many historical water users resist regularizing their water rights with the DGA's Public Cadastre of Water to avoid being levied fees for non-use, despite campaigns by the DGA to encourage regularization, which means that 'illegal' water use is widespread.[171] Thirdly, water rights are transferable within water markets, and there is no enforceable mechanism to register water rights and transfers, making it extremely difficult for the water authority to keep track of many of them.

The second factor undermining the potential of minimum flow regimes is that, under the current regime, new water users bear the burden of ensuring minimum flow rates in order to protect freshwater ecosystems. Established water rights holders continue to use water resources without any limitation, despite never having paid for their rights. This situation raises concerns about equity in water regulation,[172] especially when combined with the impacts of drought and climate change, which have considerably reduced the amount of water available in riverbeds. Many politicians, industry and productive sectors continue to resist any sort of redistribution or abrogation of water rights, pointing to the constitutionally protected right to property. In debates surrounding the 2005 reforms these sectors expressed fear that the obligation to establish a minimum ecological flow for pre-existing water rights would amount to a retroactive application of the law, which would effectively amount to an expropriation of private property rights.[173]

[Water Rights, Commentary of Supreme Court Jurisprudence 2011–2014, Non-use Tariffs. Practical Application and Interpretation Conflicts], Facultad de Derecho Pontificia Universidad Católica de Chile, undated, available at: http://derechoygestionaguas.uc.cl/images/PDF/Patente-por-no-uso-de-aguas.pdf.

[171] A. Vergara Blanco, 'Comentario: regularización de derechos de aguas y publicidad en el uso de las mismas' [Commentary: Regularization of Water Rights and Publicity of Their Use] (1996) VII *Revista de Derecho de Aguas*, pp. 254–5, at 254.

[172] Boettiger, n. 160 above, p. 9.

[173] T. Celume, *El régimen público de las aguas* [The Public Regime for Water] (Legal Publishing, 2013), p. 318.

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Thirdly, Chilean environmental institutions have conceived of and developed environmental flow methodologies and policies in a particularly limited way. The Brisbane Declaration defines environmental flows not only as 'the quantity, timing and quality of freshwater flows and level necessary to sustain aquatic ecosystems', but as supporting other uses, including cultural uses and wellbeing.[174] However, the Chilean minimum flows framework has far more limited objectives geared towards the 'preservation of nature' and 'to establish the natural conditions relevant to each superficial flow'.[175] The focus in Chilean law and policy has been only on the minimum amount of water 'needed' in the river, with no reference to quality, and excludes other factors that could influence that ecological value, such as landscape, tourism, social or cultural uses,[176] relevant for enhancing the river's value more broadly. Nor does the hydrological method used by the DGA account for the interaction of surface water resources with groundwater, necessary for an accurate understanding of complete aquatic ecosystems.

Fourthly and finally, instead of establishing a minimum percentage of water to be kept in-stream as an ecological flow and placing a cap on extractions, the Chilean legislation sets a maximum limit for the minimum ecological flow, which may not be greater than 20% of the average annual flow rate in the corresponding watercourses, or 40% in exceptional cases. These rules transform the minimum ecological flow into a negative restriction on the amount of water that can be protected within the river, inconsistent with the original purpose of environmental flows as a protective target. The legal limits on flows established do not appear to be based on any defensible methodology,[177] and more water, above the 40% average annual flow rate, may in fact be necessary or desirable to restore and ensure a healthy river ecosystem and uses of the water flowing through it.

4.3. *Indigenous Water Rights and Implications for Environmental Flows*

In addition to concerns about the environmental state of Chile's rivers, Indigenous communities voice growing concern about the unfair distribution and poor management of Chile's water resources.[178] The Chilean Indigenous population makes up approximately 12.8% of the total population, within nine Indigenous ethnicities recognized by the Indigenous Law,[179] all of which are culturally and linguistically distinct.[180]

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[174] Brisbane Declaration, n. 49 above.

[175] Water Code, n. 102 above, Art. 129 *bis* 1.

[176] Celume, n. 173 above, p. 313.

[177] Ibid.

[178] See D.A. Lovera Parmo, 'Indigenous Peoples and the Sale of Water Rights: The Case of Chile', in Langford & Russell, n. 29 above, pp. 84–118.

[179] Ley No. 19.253 establece Normas sobre Protección, Fomento y Desarrollo de los Indígenas, y Crea la Corporación Nacional de Desarrollo Indígena [Law No. 19.253 to Establish Norms for the Protection, Creation and Development of the Indigenous, and to Create the National Corporation of Indigenous Development] 1993, available at: https://www.bcn.cl/leychile/navegar?idNorma=30620 (in Spanish) (Indigenous Law).

[180] 'Instituto Nacional de Estadísticas Chile, 'Síntesis de resultados censo 2017' [Synthesis of Census Results 2017], p. 16, available at: http://www.censo2017.cl/descargas/home/sintesis-de-resultados-censo2017.pdf. See Macpherson, n. 15 above, p. 163. The 2,185,792 people who self-identify as Indigenous are the Mapuche, Aymara, Rapa Nui, Likan Antai (otherwise known as Atacameño), Quechua, Colla, Diaguita, Kawesqar, Yagan or Yamana: see generally Marín, n. 15 above, pp. 107–9.

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The Indigenous peoples living within the territory now known as Chile have been subject to widespread historical injustice and dispossession of their traditional lands and resources.[181] Their territorial rights are now recognized, to a limited extent, in domestic and international law, including ILO Convention 169, which Chile has ratified.[182]

Indigenous relationships with and interests in water resources in Chile are both distinctive and variegated, although there is a clear emphasis on spiritual as well as economic water values and a territorial approach to land and water connectivity.[183] According to Babidge, who has conducted recent anthropological research on Indigenous communities' water use and interactions with mining companies and the government in northern Chile, Indigenous water interests are characterized by 'complex waterscapes, where neither "rights" nor "values" capture the totality of Indigenous interests and processes', which include social, cultural, spiritual, economic, and environmental dimensions.[184]

The term 'cultural flow' ('*caudal cultural*' in Spanish) is not used in Chilean law or commentary, although there is some acknowledgement of the social and cultural dimensions of the environment in the Chilean legal framework. The Environmental Law, for example, defines the 'environment' as:

> [t]he global system comprised of natural and artificial elements of a physical, chemical or biological nature, sociocultural elements and their interactions, in permanent modification by human or natural activities, and which regulate and affect the existence and development of life in its multiple manifestations.[185]

However, Indigenous peoples' water use enjoys no mention in the Chilean legislative provisions or policy frameworks for environmental flows, for neither productive nor environmental uses. This is despite the fact that Chile has a comparatively strong legislative basis, under the 1993 Indigenous Law, for allocating water use rights to Indigenous peoples for a range of purposes.[186]

Article 64 of the Indigenous Law protects the rights of Aymara and Atacameña Indigenous communities from northern Chile over waters in their traditional lands, providing:

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[181] J. Aylwin, *Pueblos indigenas de Chile: antecedentes historicos y situacion actual* [Indigenous Communities of Chile: History and Current Situation] (Instituto de Estudios Indigenas Universidad de la Frontera, 1994), vol. i; R.J. Miller, L. LeSage & S. López Escarcena, 'The International Law of Discovery, Indigenous Peoples, and Chile' (2010) 89(4) *Nebraska Law Review*, pp. 819–84, at 850–83.

[182] Although Chile is also often criticized for poor implementation of the Convention: see, e.g., J. Aguas & H. Nahuelpan, 'Los límites del reconocimiento indígena en Chile neoliberal: la implementación del Convenio 169 de la OIT desde la perspectiva de dirigentes Mapuche Williche' [The Limits of Indigenous Recognition in Neoliberal Chile: The Implementation of ILO Convention 169 from the Perspective of Mapuche Williche Leaders] (2018) *Cultura-hombre-sociedad*, pp. 108–30; C. Fuentes & M. Cea, 'Reconocimiento débil: derechos de pueblos indígenas en Chile' [Weak Recognition: Indigenous People's Rights in Chile]' (2017) 25(49) *Perfiles Latinoamericanos*, p. 55–75, at 55.

[183] See Barrera-Hernández, n. 11 above; Prieto, n. 12 above; Castro et al., n. 12 above.

[184] Babidge, n. 12 above, p. 85.

[185] Environmental Law, n. 126 above, Art. 2(ll).

[186] See generally Macpherson, n. 15 above, pp. 161–213.

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> The waters of the Aymara and Atacameña communities must be especially protected. Waters, including rivers, canals, streams and springs, found on the lands of the Indigenous Communities established by this law will be considered property owned by and for the use of the Indigenous Communities, without prejudice to the rights that other right holders have registered in accordance with the Water Code.
>
> No new water rights shall be granted over lakes, ponds, springs, rivers and other aquifers that supply waters owned by the various Indigenous Communities established by this law without first guaranteeing normal water supply to the affected communities.

The protection of Indigenous water rights in Article 64 was introduced for a number of reasons, including in recognition of distinctively cultural Indigenous water interests as territorial rights connected to land, and as an attempt to halt or reverse the obstruction of Indigenous water access by other interests.[187]

These are referred to as 'ancestral' water rights and are equivalent to rights of ownership in the common law sense and are protected as property by the Constitution.[188] Consistent with typical conceptions of Indigenous resource rights in international debates, the rights recognized by Article 64 are communal in nature which, in Prieto's words, 'completely changed the institutional framework through which water could be managed in the Atacameño area, departing from the 1981 Water Code's logic and opening the possibility of collectivization'.[189] Although Article 64 refers specifically to the Aymara and Atacameña communities, it has been relied on to protect or recognize the rights of other Indigenous communities in Chile to access and use water.[190]

In order to obtain recognition of such ancestral rights, an Indigenous community may apply to the court for the regularization of their historical water use as a water right pursuant to both Article 64 of the Indigenous Law and transitional Article 2 of the Water Code.[191] To do so, the community must satisfy the requirements of Article 64 as well as the additional requirements to prove historical use since 1976 in the regularization process, discussed above.[192] The evidence put forward to accredit such use typically refers to the existence of ancient water infrastructure for irrigated agriculture, like canals or terraces.[193] As a consequence, and because of the difficulty of proving productive use that is non-consumptive or involves groundwater in the absence of water infrastructure, ancestral water rights have typically been recognized in reliance on

[187] Ibid., pp. 178–84.

[188] The status of ancestral water rights as '*propiedad*' was affirmed in *Alejandro Papic Dominguez con Comunidad Indigena Aymara Chusmiza y Usmagama* [2009] Corte Suprema [Supreme Court], No. 2840-2008 (Chile) (*Chusmiza* Supreme Court Decision), [7]; and *Toconce*, n. 112 above, p. 6.

[189] Prieto, n. 12 above, p. 231.

[190] Macpherson, n. 15 above, p. 177.

[191] Research by Prieto also reveals that regularization of the water rights of northern Indigenous communities also occurred prior to the Indigenous Law, using the regularization process, as early as 1983. These communities may not, at the time, have identified as Indigenous: see Prieto, n. 12 above.

[192] The Chilean courts have applied the process of regularization in Water Code transitional Art. 2 in conjunction with Art. 7 of Decree Law 2.603 1979, which deemed the person making '*uso efectivo*', or 'productive use', of a water right to be its owner.

[193] See, e.g., *Toconce*, n. 112 above, p. 2; *Chusmiza* Supreme Court Decision, n. 188 above, [10].

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Article 64 for the consumptive use of surface waters only.[194] Indigenous communities would be unlikely to succeed in an application for regularization of historical water use for environmental or conservation purposes where the objective is to leave the water in-stream.[195]

Because much of the surface flows of Chilean rivers were already fully allocated by the time the Indigenous Law was enacted, the Law also set up a redistributive measure – the Indigenous Land and Water Fund – to finance the acquisition of water rights for Indigenous communities.[196] This includes funding regularization cases and the necessary production of expert evidence and legal and court fees, but the Fund has been used also to finance the constitution and purchase of water rights for Indigenous groups throughout Chile. As in the case of ancestral water rights protected by Article 64, water rights acquired with the support of the Fund are equal to the consumptive water rights held by any other user (constitutionally protected property rights), subject to the proviso that they cannot be transferred separately from the land to any non-Indigenous user for 25 years unless the Fund is repaid.[197]

However, as is the case with ancestral water rights protected by Article 64 of the Indigenous Law, Indigenous communities have benefited from the Fund only where they can prove historical use and ongoing intent to use water for productive, usually agricultural, purposes. The government's intention has always been that the Fund will support the economic development of Indigenous lands,[198] and regulations prescribing the factors the government must consider before granting subsidies for water rights acquisition refer specifically to the agricultural benefits from irrigation for the lands affected.[199] Again, it is unlikely that an Indigenous community could access water rights with the support of the Fund for in-stream environmental or conservation purposes.

Aside from these two main water provisions, two provisions were added to the Indigenous Law as part of a minor amendment to the Water Code in 1992, in response to concerns about the over-extraction of aquifers by mining interests in the north of Chile.[200] These prohibit exploration and the extraction of groundwater from aquifers that supply certain wetlands of particular significance to Indigenous communities in the north of Chile, unless express permission has been granted.[201] The provisions thus indirectly protect the flow of these areas. However, Yañez and Molina suggest that

[194] Macpherson, n. 15 above, pp. 195–6.

[195] Ibid.

[196] Indigenous Law, n. 179 above, Art. 20(c).

[197] The National Indigenous Development Corporation can authorize the alienation of *derechos de aprovechamiento* if the value of the subsidy provided by the Fund is repaid: see Indigenous Law, n. 179 above, Art. 22(2).

[198] Macpherson, n. 15 above, pp. 204–5.

[199] Decreto 395 que aprueba el Reglamento sobre el Fondo de Tierras y Aguas 1994 [Decree 395 Approving the Land and Water Fund Regulations 1994] (Chile), p. 8.

[200] Ley 19.145 modifica Articulos 58 and 63 Codigo de Aguas [Law 19.145 to Modify Articles 58 and 63 of the Water Code] 1992 (Chile), Arts 1, 2.

[201] Water Code, n. 102 above, Arts 58(5), 63(3) respectively.

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these protections may have come too late for some northern wetlands, which had already been over-extracted by mining interests by 1992.[202]

A major limitation of the legal regime for the recognition and allocation of Indigenous water rights in Chile is the failure of the government to prospectively plan for and comprehensively provide for Indigenous water use. Regularization cases are ad hoc and depend both on government funding and support, and on the varied reasoning and approaches of judges,[203] thus producing a 'patchwork'[204] of Indigenous water rights throughout the country. Where water rights are already allocated to other users, a lack of prospective planning now leaves little potential to set aside a flow for Indigenous use without some form of redistribution. As mentioned, the processes for allocating water rights to Indigenous groups also favours productive water uses, and there is little to no incidence of Indigenous communities being allocated a share of water for cultural or conservation interests alone.

From 2005 to 2014, Indigenous communities who did not use their water rights for productive purposes could also be charged the tax for 'non-use' if they could not show the necessary water capture infrastructure, further disincentivizing water protection on environmental or conservation grounds. The Supreme Court held, in 2014, that in certain circumstances Indigenous communities can acquire water rights over in-stream flows and retain them without having to extract freshwater resources, without having to pay a fine for non-use of the resource.[205] The Court's legal reasoning was that fees for non-use could not be levied against Indigenous communities who hold water rights acquired with finance from the Indigenous Land and Water Fund because to do so would constitute an 'alienation' of such rights, in contravention of Article 22 of the Indigenous Law. However, the judgment does not engage with the broader context, including the implications and broader recognition of Indigenous water values and interests, environmental or conservation aspirations, or the ecological benefits of leaving water in-stream. The Court's decision was followed by a proposal that small agricultural and peasant communities and Indigenous peoples be granted a regulatory exemption from non-use taxes. However, the proposed amendment was not approved and has since been archived, leaving ongoing uncertainty for Indigenous water users.[206]

Despite the limitations of the Chilean Indigenous water provisions, Indigenous peoples do have constitutionally protected water rights in Chile, and at a minimum these should be taken into account when planning and implementing environmental water

[202] N. Yañez & R. Molina, *Las aguas indigenas en Chile* [Indigenous Waters in Chile], (LOM Ediciones, 2011) Ch. 2, at p. 106.

[203] Macpherson, n. 15 above, pp. 184–201.

[204] For a discussion of the problem of a 'patchwork' of Indigenous water rights in the context of the United States (US) see P. Womble et al, 'Indigenous Communities, Groundwater Opportunities' (2018) 361(6401) *Science*, pp. 453–5, at 453.

[205] *Corporación Movimiento Unitario Campesino y Etnias de Chile con Dirección General de Aguas* [2014] Corte Suprema [Supreme Court], No. 7899-2013 (Chile).

[206] 'Reforma el Código de Aguas, eximiendo del pago de patente a pequeños productores agrícolas y campesinos, a comunidades agrícolas y a indígenas y comunidades indígenas que se señalan' [Reform of the Water Code, Examining the Payment of Tax by Small Agricultural Producers, to Agricultural and Indigenous Communities Included], Bulletin No. 8315-01, available at: https://www.camara.cl/pley/pley_detalle.aspx?prmID=8712&prmBoletin=8315-01.

management approaches, including environmental flows. In these circumstances there is a clear need for meaningful engagement with Indigenous communities in Chile around their water rights, needs and aspirations. All institutions involved in environmental water regulation need to 'understand Indigenous water values, connections, and relationships at the appropriate scales', and design approaches that 'better accommodate multiple and often conflicting ways of interacting with, valuing, and relating to rivers'.[207] Marín, a Chilean Indigenous scholar, has emphasized this challenge not only in terms of inclusive water governance and planning, but as a constitutional challenge, requiring the redistribution of resources rights and decision-making power:

> Under the neo-liberal frame, the constitutional debate over Atacameños or Aymara water rights needs more than the mere acceptance of pluralism; recognition in the new Constitution needs to pursue the redistribution of power and resources between the Chilean state and Indigenous People through constitutional law.[208]

4.4. *Water Reform and the Constitutional Crisis*

Chilean governments have now revisited the Water Code several times, and numerous draft reform proposals have been developed, and shelved.[209] The most recent substantial reform proposal was introduced in 2011 by a group of Parliamentarians, drawing together a number of reforms proposed between 1992 and 2011.[210] The government amended this proposal in 2014 and presented a new consolidated water reform project, which is still before Parliament.[211] Among other objectives, the reform proposal sought to strengthen the government's oversight role with regard to water, and incentivize a more equitable distribution of water rights. The government presented the reform proposal with the message:

> Our legislation, from early on, has maintained that 'waters are goods of public use'. However, it is inconceivable that this statement becomes a dead letter: it is necessary to provide it with substance.[212]

The main reforms proposed by the government included a change in status for new water rights, from perpetual to temporary (30 years, extendable), and the expiration of water rights for non-use (four to eight years depending on whether they are consumptive or non-consumptive). The reforms would also allow the government to (i) limit the exercise of water rights in the public interest, reducing them temporarily or redistributing water rights; (ii) introduce priority for the use of water for human

[207] Douglas et al., n. 51 above, p. 362.

[208] Marín, n. 15 above, p. 91.

[209] Examples include Bulletins 652-07, 1779-07, 6124-09, 6208-09, 6268-07, 6141-09, 6816-07.

[210] Cámara de Diputados de Chile, Proyectos de Ley [Parliamentary Motions], pp. 7543-12, available at: https://www.camara.cl/pley/pley_detalle.aspx?prmID=7936&prmBoletin.

[211] Presidencia de la República, Oficio N° 459-362, 8 Oct. 2014 (Chile) (referring to the Project of Law Bulletin, pp. 7543-12). For a summary of the post-2005 reforms up to 2015 see Bauer, n. 14 above, pp. 159–67.

[212] Presidencia de la República, ibid.

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consumption and sanitation; (iii) prohibit the constitution of new water rights in National Parks and Virgin Region Reserves; (iv) limit the grant of water rights in other protected areas; and (v) strengthen certain regulatory powers of the DGA.

The government continued to work on and make changes to the project,[213] but the proposal was significantly expanded, via the legislative process, after Michelle Bachelet and her centre-left coalition took office for the second time in 2014.[214] Responding to ongoing water-related protest and conflict in Chile, Bachelet had made an election promise to reform the Constitution and the Water Code as part of a broader project of social policy reform.[215]

By 2016 the Lower House had added recognition of the human right to water and sanitation to the reform proposal and introduced priority uses for water (human consumption and sustainability of freshwater resources), allowing the government to create 'water reserves' to ensure those priority uses.[216] In terms of environmental flows, the Lower House inserted a provision that would extend the application of Article 129 *bis* 1 of the Water Code, requiring environmental flows to be set for all future water concessions. The Lower House also allowed the DGA to establish minimum ecological flows on water rights already allocated in areas which the Ministry of Environment considered to be threatened, degraded or prioritized ecosystems, or within 'protected areas'.[217] In addition, it added a provision to affirm the practice of the DGA of applying minimum ecological flows where the holder proposes to change the point of water capture.

The proposed reforms, as elaborated by Parliament, included new 'use it or lose it' rules, whereby water rights would become extinguishable after a period of non-use, extending and attempting to improve the system of taxes for non-use.[218] This included extending the categories of exception to cases where rights holders are Indigenous people or communities (reflecting recent jurisprudence of the courts, discussed above),[219] water rights that are 'not used' by rights holders to maintain ecological function in protected areas declared by the Ministry of Environment, and water rights used for recreational, tourism or other projects that do not require water to be used or extracted from its source.

The reform proposal also included further substantive provisions to protect Indigenous rights to water. Clause 5 of the proposal provided:

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[213] The government amendments include: Presidencia de la República, Oficio N° 1097-362, 6 Jan. 2015, referring to the amendment of the Water Code, Bulletin No. 7.532-12; Presidencia de la República, Oficio N° 613-363, 6 July 2015, Bulletin No. 7.543-12; and Presidencia de la República, Oficio N° 926-363, Bulletin No. 7.543-12.

[214] For a thorough assessment of the ongoing water reforms and legislative minutes, see 'Ojo con el Parlamento' [Keep an Eye on Parliament], an initiative of the NGO Chile Sustentable, available at: http://www.ojoconelparlamento.cl.

[215] Bauer, n. 14 above, p. 162.

[216] President of the Senate, Proyecto de reforma al Código de Aguas [Water Code Amendment Bill] Oficio N° 12.995, 22 Nov. 2016, Art. 129 *bis* 1.

[217] This would not affect water rights allocated to small farmers, according to Art. 13 of Law No. 18.910.

[218] Water Code Amendment Bill, n. 216 above, Art. 129 *bis* 1.

[219] Those referred to in Art. 5 of the reform approved by the Lower House, and Arts 2 and 9 of Law No. 19.253.

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> In the case of indigenous territories, the State will ensure the integrity between land and water, and protect waters for the benefit of indigenous communities, in accordance with laws and international treaties ratified by Chile that are currently in force.[220]

This proposed amendment attempted to reverse the separation of water and land rights in Chilean water law frameworks,[221] and adopts the logic of ILO Convention 169 in relation to the integrity of Indigenous territory.[222] Clause 5 left the door open to further interpretation in line with developing international commitments around environmental law and Indigenous rights, given its explicit reference to international law.[223]

The reform proposal also included prioritization of water use for human consumption and sanitation,[224] in line with a shift back towards emphasizing water as a *bien nacional de uso publico* [national property for public use] and reflecting ongoing concerns about priority of use and unfair distribution of water. However, there was little clarity in the proposal as to how the priority mechanism would work in practice. The proposal included a number of further exceptions to general principles for Indigenous communities, apart from fees for non-use; these include exemptions from the five-year limit on regularization of water use rights,[225] and exemptions from restrictions on exercising water rights once a basin has been declared 'exhausted'.[226]

Although these Indigenous-specific protections looked promising, controversy surrounded the reform process and the Chilean government was accused of failing to properly consult with Indigenous peoples. According to the then Director of the Chilean DGA, the Parliamentary committees charged with developing the law reform proposal decided to leave the Indigenous protections out of the early stages of the reform project in order to avoid consulting with Indigenous peoples and consequent cost and delay.[227] This suggests a clear disregard not only for the legally protected rights to water held by Indigenous peoples, but also for the Indigenous right to consultation underscored in Chile's commitment to ILO Convention 169,[228] as well as domestic legislation on consultation with Indigenous peoples.[229]

In any event, the Bachelet administration was unable to pass the reforms prior to a change of government in 2017 and, as of 2020, the project languishes before the Senate. The incumbent right-wing Piñera government (returned for the second time in 2017) until recently has had little appetite for reforming water law away from a market-based logic. After taking office, President Piñera announced his opposition to the water

[220] Water Code Amendment Bill, n. 216 above, Art. 5 *bis*.

[221] Indigenous resistance to separation of land and water, in line with international and regional law and jurisprudence, has been emphasized since the development of the Indigenous Law: see Macpherson, n. 15 above, pp. 161–210.

[222] ILO Convention 169, n. 58 above, Arts 6, 7.

[223] Water Code Amendment Bill, n. 216 above, Art 5.

[224] Ibid.

[225] Ibid., transitional Art. 2.

[226] Ibid., transitional Art. 5.

[227] Macpherson, n. 15 above, p. 209.

[228] ILO Convention 169, n. 58 above, Arts 6, 7. For more analysis of the application of ILO 169 in Chile's regional context see Marín, n. 15 above, pp. 99–105.

[229] Indigenous Law, n. 179 above, Art. 34.

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reform project, arguing that it presents uncertainty and probable loss for the Chilean agricultural sector.[230] His new government would instead provide security for water rights by re-establishing the legal certainty of new and historical water rights as property.[231] Meanwhile, it appeared, Indigenous and environmental water concerns would remain unresolved.

In August 2017 the Special Committee of Freshwater Resources, Desertification and Drought approved the reform proposal and passed it to the Agriculture Committee of the Senate.[232] The government again amended the proposal in January 2019,[233] restating the central objectives of the reform proposal as:

- addressing water scarcity;
- improving legal certainty of water rights;
- prioritizing the use of water for human consumption;
- promoting non-extractive uses;
- strengthening private water user associations;
- streamlining processes for water infrastructure permits;
- preventing water rights speculation; and
- supporting better coordination between water authorities and users.[234]

As remodified by the Piñera government, the proposal reinforces the status of water rights as perpetual, transferable, and non-extinguishable. The proposal no longer refers to Indigenous peoples and instead dismisses the Lower House's modification of Article 5 to ensure the integrity between land and territory for Indigenous communities, and removes the exemption for Indigenous water users from fees for non-use.

In terms of minimum ecological flows, the amended proposal states that, even though minimum flows may have achieved outcomes in the south of Chile, 'they are not the right tool to preserve those river basins where water rights have already been assigned in their entirety before 2005, nor to preserve groundwater'.[235] It goes on to acknowledge that 'under the current reforms there are no incentives to voluntarily preserve environmental water, due to the fact that non-use is fined via

[230] S. Piñera, 'En nuestro gobierno vamos a aasegurar la disponibilidad de agua' [In Our Government We Are Going to Secure Water Availability], 2 Oct. 2017, available at: http://www.sebastianpinera.cl/sebastian-pinera-en-nuestro-gobierno-vamos-a-asegurar-la-disponibilidad-de-agua.

[231] 'Programa de Gobierno 2018–2022: construyamos tiempos mejores para Chile' [Government Programme 2018–2022: Let's Build Better Times for Chile], 2017, available at: http://www.sebastianpinera.cl/images/programa-SP.pdf.

[232] Constituted in Mar. 2018 by Senators Carmen Gloria Aravena Acuña (President of the Commission), Juan Castro Prieto, Álvaro Elizalde Soto, Felipe Harboe Bascuñán, and Ximena Rincón González.

[233] Oficio N° 369-366, 'Indications to the Proposal to Amend the Water Code', Bulletin No. 7543-12, 10 Jan. 2019.

[234] E. Baeza, 'Aspectos relevantes de la indicación sustitutiva del poder ejecutivo al proyecto de ley que reforma el Código de Aguas' [Relevant Aspects of the Motion to Substitute the Legislative Project to Reform the Water Code], Bulletin No. 7.543-12, National Parliamentary Library, Apr. 2019.

[235] Oficio N° 369-366, que formula indicación sustitutiva al proyecto de ley que reforma el Código de Aguas [formulating the Motion to Substitute the Legislative Project to Reform the Water Code], 10 Jan. 2019, Bulletin No. 7.543-12.

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the tariff'.[236] However, the government's analysis misses the point. The short-lived promise of the reform proposal was its potential to encourage, through legislation, the conservation of water in-stream, potentially even opening the way for international financial donors to buy and claim water rights to protect freshwater ecosystems. For the government to declare that environmental flows do not work is ironic, given that their ineffectiveness to date is as a result of the government's unwillingness to address unnecessary legal limitations on environmental flows or to use all tools available to support environmental and cultural outcomes. These limitations have been compounded by the fact that when minimum ecological flows were incorporated into legislation in 2005, most water rights in the central and north macro regions of Chile were already fully allocated, and the government has not been prepared to consider the prospect of reallocation of water for the environment.

If passed, the Piñera government's minimal water reforms will at least grant a greater oversight role to the DGA and provide more clarity regarding fines for non-use. The proposed reforms, however, as they stand do not provide sufficient tools within the existing market-based regulatory framework to encourage in-stream flow protection. Even these limited reform proposals have been met with strong opposition from commercial and industrial sectors – including the mining, energy, and agricultural sectors (and the Ministry for Agriculture in representing their interests) – who have expressed their concerns about the constitutionality of the evolving reform project, and its impact on investment.[237]

The water reform proposal continued to stumble through the legislative process. The last session of the Agricultural Committee was held on 18 November 2019 and discussed water scarcity.[238] In the meantime, however, the neoliberal model underpinning the Chilean water regime has provoked renewed social contestation and a constitutional crisis, which unfolded on 18 October 2019. In the wake of social protest and the constitutional crisis, the project to modify the Chilean Constitution and related debates around the regulatory regime for water have been revived, in an effort to demonstrate the commitment of politicians to address public demand.[239]

After many hours of discussion with Parliament, on 15 November 2019 the government announced an Agreement for Social Peace and a New Constitution,[240] in which

[236] Ibid.

[237] Among the participants were Antonio Walker (Ministry of Agriculture), Andrés Meneses (Legal Adviser to the Ministry of Agriculture), Felipe Hermosilla (Legal Adviser to the Ministry of Public Works), Fernando Peralta (President of the Association of Canals, Chile), Sara Larraín (Director of Chile Sustentable), Gloria Alvarado (National Federation of Rural Drinkable Water, Chile), Juan Pablo Schuster (President of Fundación Newenko); Evelyn Vicioso (Director of Association of Small and Medium Hydropower Stations), Professor Alejandro Vergara Blanco, Rodrigo Mardones (Partner of the National Association of Milk Producers), Joaquín Villarino (Executive President of the Mining Council), Hernán Valenzuela (Adviser to Fundación Jaime Guzmán).

[238] Ibid.

[239] See Bulletin No. 6124-09, 'Sobre el dominio público de las aguas' [About the Public Domain of Waters], available at: https://www.senado.cl/appsenado/templates/tramitacion/index.php?boletin_ini=6124-09.

[240] Acuerdo por la paz social y nueva Constitución [Agreement for Social Peace and a New Constitution], 15 Nov. 2019, available at: https://www.senado.cl/logran-historico-acuerdo-para-nueva-constitucion-participacion/senado/2019-11-14/134609.html.

the government committed to hold a referendum (initially set for 29 April 2020, but delayed to October as a result of the COVID-19 pandemic). The two questions to be asked in the referendum are: (i) whether Chile requires a new Constitution; and (ii) whether any new Constitution should be drafted by a 100% parliamentarian or 50/50 parliamentarian/elected citizen composition. Much of the detail of the referendum process is still uncertain, but there is growing public debate and social mobilization around constitutional reform and the fair distribution of rights. Certainly, Article 19(24) of the Constitution, and specifically the right to property over water rights, will play a key role in the discussions, which may have implications for the future of environmental flows in Chile.

5. TOWARDS HOLISTIC ENVIRONMENTAL FLOWS IN CHILE

There is now an international consensus around the need for the implementation of environmental flow regimes in domestic water law and policy frameworks in order to protect the health of rivers and waterways for future generations. Conceptions of environmental flows now acknowledge the social as well as the ecological functions of environmental flows, and the need for environmental flow regimes to reflect and account for Indigenous water governance and rights. Advocates of an expanded conception of environmental flows are arguing for recognition of local and Indigenous governance frameworks and interests to build legitimacy in environmental flow regimes and water planning more broadly.[241] Douglas and his co-authors provide a useful conceptual starting point for the design of a holistic environmental flow regime, which accounts for cultural as well as ecological interests.[242]

The current model for environmental flows in Chile is not holistic. Although there is some legislative and policy provision for environmental flows, these are limited and have been implemented in an ad hoc manner. The minimum ecological flows instituted by the DGA, for example, are based on a restrictive hydrological model, which fails to account for social or cultural water needs, or for the interdependence of surface water flows with groundwater. Further, the power of the DGA to set minimum ecological flows applies only to the granting of new water rights, even though water had already been largely allocated to private users when the process began. Meanwhile, the courts continue to regularize historical water uses without considering the availability of water and without any sort of prospective planning. The minimum environmental flows set by the Environmental Impact Assessment Service are similarly restrictive, applying only to prospective major projects, while the vast majority of water rights in Chile have been allocated (free of charge) without any consideration of the interests of the environment, or social and cultural interests. Aside from the obligation to set minimum flows, and consistent with the minimal public approach to water regulation in Chile, there is very little policy guidance on how these flows are managed and protected by the DGA, the Service, or private water user associations once they are established.

[241] See Douglas et al., n. 51 above, p. 362.
[242] Ibid.

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Nor are the significant legal rights and values of Indigenous peoples incorporated in the determination or management of environmental flows in Chilean law and policy. If anything, Chilean water law frameworks disincentivize non-extractive environmental or cultural water uses by charging fees for non-use where holders of water rights wish to leave water in-stream. Indigenous peoples' 'complex waterscapes' of social, cultural, spiritual, environmental, and economic interests[243] are reflected in legislative protection of ancestral water rights (at least in the north of Chile, but arguably more broadly) and a Fund that exists for the allocation of water rights elsewhere. Environmental flows are not a substitute for substantive water rights for Indigenous peoples for consumptive, productive or economic purposes, but should be implemented alongside existing mechanisms that fund the recognition and allocation of water rights for Indigenous peoples in Chile.

We argue that the Chilean government should strive towards a comprehensive minimum flow regime in Chile, which protects environmental or ecological water qualities to support ecosystem health, and takes into account Indigenous rights and interests. There are multiple legal reasons why the government should do so. Chilean institutions have in the past been prepared to rely on implied regulatory powers, and Chilean courts have supported them in doing so, emphasizing the important role that public authorities have to play in protecting the environmental qualities of waterways. Our review of Chilean legal decisions has demonstrated that the Supreme Court is prepared to uphold the provision of minimum environmental flows, pointing to the institutional obligation to manage the environment in the public interest and the constitutional right to a healthy environment, despite the impact on other water users.

The role that the Chilean government should take in environmental water management is inherent, in our view, in the characterization of waters as 'national goods for public use'. In this context, the public interest encompasses not only the use of water for industrial or commercial purposes and human consumption, but also extends to ensuring healthy ecosystems and their preservation for future generations.[244] It is also consistent with public authorities' obligations to protect biodiversity and the environment under Articles 41 and 42 of the Environmental Law and a range of regulatory imperatives in the Water Code. The Water Code requires the DGA to consider the rights of 'third parties' when granting new water rights,[245] which could include harm or impact on ecosystems, thus implying a duty imposed on the water authority to take into account the need for in-stream flows in its decision making.[246] Most significantly, the duty to protect the environmental quality of rivers and develop an effective environmental flow regime is also a constitutional mandate. Article 19(8) of the Constitution protects the right to a clean and healthy environment, and states explicitly that 'the law may establish specific restrictions on certain rights or freedoms in order to protect the environment'. Environmental water governance should not be left to private

[243] Babidge, n. 12 above, p. 85.
[244] Celume, n. 173 above, p. 136.
[245] Water Code, n. 102 above, Art. 22.
[246] Riestra, n. 77 above, pp. 103, 108.

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water user associations, when it is a constitutional imperative and a matter of public interest.

There are also clear legal reasons why the Chilean institutions should plan for and include Indigenous peoples to 'build legitimacy'[247] in the implementation and management of environmental flows. Chile has ratified ILO Convention 169, with its protection of Indigenous territorial rights to natural resources. In the Chilean constitutional system, international human rights treaties are, at least in theory, 'self-executing',[248] meaning that the growing international consensus around the right to water, environmental rights, Indigenous rights, and even the rights of nature, may provide opportunities to influence local reform in Chile.[249]

In terms of the grant of new water rights, there is nothing to prevent either the DGA or the Environmental Impact Assessment Service from revising their approach to setting environmental flow requirements in a more holistic manner, by taking into account ecosystem health, and current and prospective Indigenous water uses and values. The Service, we recall, is not legally bound by the current DGA limits for minimum ecological flows,[250] and could in fact enhance the protection of freshwater ecosystems by taking into account other elements that might not be considered as part of the DGA's methodology. As the Supreme Court has emphasized, government institutions should use their powers to conduct an adequate and effective minimum flow regime, in line with their obligations under the Constitution to uphold the right to a clean and healthy environment and various domestic laws. Nor is there anything to prevent the institutions from working together with Indigenous peoples in the determination and management of environmental flows; again, the government should do this in line with its commitments under ILO Convention 169.

Where existing water users, including Indigenous communities, already hold water rights, and wish to leave those water rights in-stream for conservation, spiritual or cultural purposes, it would be relatively straightforward to allow them to do so, and to plan for this use within environmental flow regimes. Users who leave river flows in-stream for environmental or cultural purposes should be exempt from paying fines for 'non-use' and, to promote certainty, this exemption should be prescribed by law.

We acknowledge that for Chile to move towards a holistic environmental flow regime would require significant public investment, and probably legislative reform.[251] Water regulation in Chile is generally contentious, because of the quantity and range of

[247] Douglas et al., n. 51 above, p. 361.

[248] Constitution, n. 103 above, Art. 5(2).

[249] O. Recabarren, 'El estándar del derecho de aguas desde la perspectiva del derecho internacional de los derechos humanos y del medio ambiente' [Water Law Standards from the Perspective of the International Law of Human Rights and Environment] (2016) 14(2) *Estudios Constitucionales*, pp. 305–46, at 307.

[250] Which is typically 20% of the average annual flow rate in the corresponding watercourse.

[251] In Australia, significant controversy surrounded the recovery of water for the environment and significant government investment and leadership was required to establish the environmental flow regime. The diversion of water from productive to conservation purposes divided environmentalists and agriculturalists in a fierce political battle over the protection of private rights versus the public interest: see generally O'Donnell & Macpherson, n. 52 above, p. 32.

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interests in Chile's rivers, including those of productive users.[252] In catchments where water rights are already fully or over-allocated, some form of water recovery would be needed, and buying back rights is an expensive prospect. Gomez and co-authors estimated in 2014 that the cost of buying back water for environmental flows and pollution-dilution in the Maipo River would be USD 1.9 million.[253] Nevertheless, they underline the need for Chilean policy makers to consider the social benefits of environmental water more fully, and argue that buying back rights is a more efficient way to manage pollution than other pollution-reduction alternatives.[254]

Any sort of compulsory redistribution of water to the environment would have an impact on water rights that have already been allocated, which means that the government would need to amend Article 129 *bis* 1 to remove the express restriction of minimum environmental flows to the granting of new water rights. This may require a constitutional change, or an amendment to the protection of water rights as property under Article 19(24) of the Constitution, requiring a two-thirds majority in the Senate.[255] Given Chile's fraught history of water reform and entrenched water interests, such a drastic reform is unrealistic, although further research may suggest other legal avenues for transformative change.

6. CONCLUSION

Water resources in Chile are under increasing pressure and the available quantity and quality of water is likely to decrease further as populations grow, development intensifies, and climate change advances.[256] This will continue to have major implications for the natural world as well as for humans, in terms of water security, health, prosperity, wellbeing, and the likelihood of more frequent and intense water conflicts.[257] There remain major challenges for Chile in protecting the environmental state of its freshwater ecosystems in a way that fairly reflects social and cultural relationships with and interests in water. There is growing public concern and conflict around the role of the market-based model underpinning the Water Code and the ability of existing institutions to address the serious environmental problems Chile faces.

In this article we have assessed the legal and policy framework for environmental flows in Chile, and found it to be inadequate and in need of change. We have made a case for a more holistic environmental flows regime in Chile, and for government institutions to plan prospectively for and administer a comprehensive environmental

[252] Bauer, n. 6 above, p. 598; O'Donnell & Macpherson, n. 52 above, pp. 24–5.

[253] J. Gomez, C. de la Maza & O.A. Melo, 'Restoring Environmental Flow: Buy-Back Costs and Pollution Dilution as a Compliance with Water Quality Standards' (2014) 16(5) *Water Policy*, pp. 864–79.

[254] Ibid., p. 877.

[255] E.g., in Jan. 2020 the Senate rejected a constitutional reform proposal started in 2008 which sought to modify the water regime and failed to achieve the necessary two-thirds majority. See the parliamentary debates: Bulletin No. 6124-09, available at: https://www.senado.cl/appsenado/templates/tramitacion/index.php?boletin_ini=6124-09.

[256] Valdés-Pineda et al., n. 3 above, p. 2563.

[257] Arthington, n. 13 above, pp. 14–5.

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flow regime. We recognize that in the context of finite water resources, safeguarding environmental flows and including a flow of water for Indigenous use – potentially requiring the redirection of water away from consumptive, economic purposes – may be costly and politically unpalatable. However, until in-stream uses are recognized by Chile's water regime and protected by the legal framework, those who seek conservation of in-stream flows will be placed in a position of conflict with those who benefit from their absence.

During this time of social uprising around neoliberal politics and the distribution of property rights, the Chilean government should consider the balance between constitutionally protected private property and other constitutional environmental, social and cultural rights. At the same time, the government should pay attention to the unresolved constitutional demands of Indigenous peoples, because:

> there are some limited gains to be achieved, in terms of uncovering an historical debt with Indigenous People, and at the same time give some hope(s) to the possibility of achieving a different, non-western non-liberal, constitutional arrangement. The new constitution for Chile needs to make sense of the geographical location we live in and the plurality of its inhabitants. This avenue could also open up the space for a conversation of alternative legalities after 500 years of forceful assimilation.[258]

The challenge for Chile is to establish and operate a minimum environmental flow regime to protect the conservation of a flow of water necessary to maintain healthy aquatic ecosystems and reflect Indigenous custodianship for and rights to water resources, in a way that applies to existing water users as well as future applicants for water rights. This is especially important, because if Chilean institutions fail to plan effectively for minimum environmental flows, they may undermine the potential for Chilean rivers to support any water use (including economic) in the future.

Many would argue that the socio-political dynamics are too entrenched in Chile, and institutions too path-dependent, for any sort of transformative change. However, Chile is experiencing an unprecedented social change of constitutional scale, which highlights the ongoing need to consider issues of fairness and resilience in water rights and regulation, including adequate provision for the environment and Indigenous peoples.

[258] Ibid.

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