TOWARDS AN HOLISTIC ENVIRONMENTAL FLOW REGIME IN CHILE: PROVIDING FOR ECOSYSTEM HEALTH AND INDIGENOUS RIGHTS

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Abstract

A widespread response to the pressures being 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 Chile, however the legal and policy requirements are limited in scope and coverage 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 (1973-1990), highlights the need to revisit the sensitive and unresolved issues of water governance and equity.

Key words: environmental flows, cultural flows, Indigenous water rights, water equity and distribution, Chile

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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 of the north to the 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 1251 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 advancements 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 place

*All translations have been carried out by the authors.

[1] OECD, *Water Resources Allocation Chile* (2015) available at: https://www.oecd.org/chile/Water-Resources-Allocation-Chile.pdf.

[2] Dirección General de Aguas, 'Atlas del Agua' [Atlas of Water] (Dirección General de Aguas, Ministerio de Obras Públicas, Chile, 2016), at p 18.

[3] R. Valdés-Pineda, R. Pizarro, P. García-Chevesich, J. B. Valdés, C. Olivares, M. Vera, F. Balocchi, F. Pérez, C. Vallejos, R. Fuentes, A. Abarza, and B. Helwig, 'Water governance in Chile: Availability, management and climate change', *Journal of Hydrology*, 519 (2014), 2538–67, 2539, 2544; P. Pino, V. Iglesias, R. Garreaud, S. Cortés, M. Canals, W. Folch, S. Burgos, K. Levy, L. P. Naeher, and K. Steenland, 'Chile Confronts its Environmental Health Future After 25 Years of Accelerated Growth', *Annals of Global Health*, 81/3 (2015), 354–67; Á. Alonso, R. Figueroa, and P. Castro-Díez, 'Pollution Assessment of the Biobío River (Chile): Prioritization of Substances of Concern Under an Ecotoxicological Approach', *Environmental management*, 59/5 (2017), 856–69.

[4] G. Donoso (ed.), 'Introduction' in *Water Policy in Chile*, (Springer, 2018) 2.

[5] See A. S. Vega, K. Lizama, and P. A. Pastén, 'Water Quality: Trends and Challenges' in G. Donoso (ed.), *Water Policy in Chile*, (Springer, 2018).

[6] See C. J. Bauer, 'Dams and Markets: Rivers and Electrical Power in Chile', *Natural Resources Journal*, 49 (2009), 583–651; J. Budds, 'Power, Nature and Neoliberalism: The Political Ecology of Water in Chile', *Singapore Journal of Tropical Geography*, 25/3 (2004), 322–42; S. Babidge and P. Bolados, 'Neoextractivism and Indigenous Water Ritual in Salar de Atacama, Chile', *Latin American Perspectives*, 45/5 (2018), 170–85; F. M. Camacho, 'Competing rationalities in water conflict: Mining

strain on the social and environmental uses of rivers. However, in many instances in the South, water availability exceeds demand,[7] and there remain rivers that 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 recognised by governments. Indigenous conceptions of water resources, including in Chile, are routinely described as being different from dominant or Western approaches which often frame resources in terms of property or use rights. In the south of Chile, for example, *Mapuche* communities conceive of water resources as being connected to their ancestors, metaphysical entities and the total embodiment of nature, and have a sacred connection to and respect for water.[10] For other Indigenous groups in the north, such as the *Aymara* and *Atacameño* communities, where water resources are a vital element of the agricultural economy, water plays an important role in Indigenous political organization and identity.[11]

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and the indigenous community in Chiu Chiu, El Loa Province, northern Chile', *Singapore Journal of Tropical Geography*, 33/1 (2012), 93–107.

[7] See Valdés-Pineda, Pizarro, García-Chevesich, Valdés, Olivares, Vera, Balocchi, Pérez, Vallejos, Fuentes, Abarza, and Helwig, 'Water governance in Chile: Availability, management and climate change', 2563.

[8] For example, according to the Chilean National Committee on large dams, there are no large dams in the Austral Region of Chile's south. See http://www.icoldchile.cl/directorio/.

[9] Aylwin J., *Pueblos Indigenas de Chile: Antecedentes Historicos y Situacion Actual [Indigenous Comunities of Chile: History and Current Situation]* (Instituto de Estudios Indigenas Universidad de la Frontera, 1994) vol 1; Nancy Yañez and Raul Molina, *Las Aguas Indigenas En Chile [Indigenous Waters in Chile]* (LOM Ediciones, 2011).

[10] See generally Barrera-Hernández L., '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*.

[11]See M. Prieto and M. Prieto, 'Bringing water markets down to Chile's Atacama Desert', *Water International*, 41/2 (2016), 191–212, 192.; Manuel Prieto, 'Privatizing Water and Articulating Indigeneity: The Chilean Water Reforms and the Atacameño People (Likan Antai)', The University of Arizona 2014; Castro M., Bahamondes M., Albornoz P., Basaure M. F., Cayo S. B, Larama S., Hidalgo R., *El Derecho Consuetudinario En La Gestión Del Riego En Chiapa. Las Aguas Del 'Tata Jachura'*

Consistent with the international context,[12] there is a growing concern that pollution and low or absent flow rates in Chile's rivers are a consequence of anthropogenic water extractions and overuse of freshwater resources.[13] There is parallel 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.[14] Chile's water crisis is playing out in the context of growing social and political movements about structural inequality,[15] and is exacerbated by the effects of climate change,[16] and the inability of regulatory frameworks and institutions to adapt fast enough to manage water as a scarce and threatened resource.[17]

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. To do so we have carried out in-depth

[Customary Rights in Irrigation Management in Chiapa. The Waters of 'Tata Jachura'] (Konrad Adenauer Stiftung, 2017);S. Babidge, 'Contested value and an ethics of resources: Water, mining and indigenous people in the Atacama Desert, Chile', *The Australian Journal of Anthropology*, 27/1 (2016), 84–103, 92.

[12] See A. H. Arthington, *Environmental flows: saving rivers in the third millennium*, 1 ed. (University of California Press, 2012), vol. iv, 14 for an overview of environmental flows in international theory and practice.

[13] See C. J. Bauer, 'Water conflicts and entrenched governance problems in Chile's market model', *Water Alternatives*, 8/2 (2015), 159 for a contemporary overview of Chile's water management challenges. But see Introduction in Donoso, ed, *Water Policy in Chile*, 2. Donoso argues that Chile's water challenges are also a result of naturally high levels of heavy metals in Chilean water resources.

[14] E. Macpherson, *Indigenous Rights to Water in Law and Regulation: Lessons from Comparative Experiences*, (Cambridge University Press, 2019), 161–210; A. Á. Marín, 'Constitutional Challenges of the South: Indigenous Water Rights in Chile - Another Step in the "Civilizing Mission?', *Windsor Yearbook of Access to Justice*, 33/3 (2017), 87; M. D. Davis, 'Indigenous Rights and Modern Water Management in Chile', Critical Transitions in Water and Environmental Resources Management, pp. 1–12, 3–4.

[15] See J. Bartlett, '*Chile Protests: UN to Investigate Claims of Human Rights Abuses after 18 Deaths',* 24 October 2019, available at: https://www.theguardian.com/world/2019/oct/24/chile-protests-human-rights-un-investigation. See generally C. J. Bauer, 'Water conflicts and entrenched governance problems in Chile's market model', *Water Alternatives*, 8/2 (2015) which discusses the intensification of water conflicts in Chile in the past decade and their rising profile in public debate.

[16] Valdés-Pineda, Pizarro, García-Chevesich, Valdés, Olivares, Vera, Balocchi, Pérez, Vallejos, Fuentes, Abarza, and Helwig, 'Water governance in Chile: Availability, management and climate change', 2563.

[17] See Marín, 'Constitutional Challenges of the South: Indigenous Water Rights in Chile - Another Step in the "Civilizing Mission?', 97.

analysis of Chilean legislation, case law, and legislative reform proposals and debates in the political, historical and cultural context, some of which is yet to be exhibited for an English-speaking audience.[18] 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 contextualisation in the interdisciplinary scholarship.[19] We note that public and academic debates around water, human rights and indigenous rights are highly polarised in Chile,[20] and we have attempted to do justice to a spectrum of scholarly and public opinion, although we remain grounded by 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 dictatorship. 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 legal and policy landscape is developing rapidly in Chile, in some situations, there is no academic commentary or analysis for legal or policy proposals other than media coverage and, in these situations, our interpretations are naturally tempered.

Given Australia's existing experience with environmental flows, and more recent agitation and concern around Indigenous water rights, including the 'cultural flows'

[18] For other recent examples of English language commentary see Bauer, 'Water conflicts and entrenched governance problems in Chile's market model'; Donoso, ed, *Water Policy in Chile*.

[19] See M. V. Hoeke, 'Deep Level Comparative Law', in M. V. Hoeke (ed.), Epistemology and Methodology of Comparative Law, (Oxford: Hart Publishing, 2004), p. 165.

[20] Bauer, 'Water conflicts and entrenched governance problems in Chile's market model'.

policy,[21] we make occasional reference to the Australian experience. However, we emphasise that the Australian experience must be treated carefully, in its own particular historical, political and social context, as a model with its own challenges and flaws.[22] We are not advocating for the adoption or 'transplantation'[23] of the Australian approach in Chile, but maintain that reflecting on foreign experiences can help elucidate domestic concerns.[24]

We argue that there is need for a comprehensive minimum flow regime in Chile to protect environmental or ecological water qualities and take into account Indigenous rights and interests. At a minimum, this regime must exempt users, including Indigenous peoples and environmentalists, who leave river flows in-stream, 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.[25]

We acknowledge that setting aside an adequate water allocation for environmental or cultural purposes in Chile will not be easy, and that transformative

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[21] See A. C. Horne, Erin O'Donnell, and Rebecca E Tharme, 'Mechanisms to Allocate Environmental Water', in Angus Webb, A. C. Horne (eds.), Water for the environment : from policy and science to implementation and management, (2017); Murray Lower Darling Rivers Indigenous Nations and Northern Murray–Darling Basin Aboriginal Nations, 'Agreed definition of cultural flows'.

[22] For a discussion of the ongoing inadequacies of Australian water law see, eg, S. Jackson, 'Enduring and persistent injustices in water access in Australia', Natural Resources and Environmental Justice: Australian Perspectives, (Victoria: CSIRO Publishing, 2017).

[23] For a discussion of legal transplants and their risks see J. Gillespie and P. Nicholson, *Law and development and the global discourses of legal transfers.*, (Cambridge, UK ; New York : Cambridge University Press, 2012., 2012).

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

[25] See the discussion of the need for allocation of consumptive water rights for Indigenous peoples, including in Chile, in Macpherson, *Indigenous Rights to Water in Law and Regulation: Lessons from Comparative Experiences*.

water reform has, until now, been impossible to secure.[26] 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 dictatorship, highlights the need to strive towards more inclusive and equitable water governance and allocation.[27]

2. AN HOLISTIC APPROACH TO ENVIRONMENTAL FLOWS

The challenge of effective water regulation to ensure water availability and quality for present and future generations is not peculiar to Chile, but is a shared concern for the world community.[28] 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.[29] There is growing international attention, however, to the right to water and water for the environment, which makes a clear link between resource

[26] See Bauer, 'Water conflicts and entrenched governance problems in Chile's market model'. Bauer explains the historical inability to fundamentally transform Chile's ideologicized water law and policy model.

[27] As indications of local trends see Bonnefoy P. Chile's President Says He Will Support a New Constitution, The New York Times (11 November 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 al Agua [Presentation of a Constitutional Admendment to grant Human Rights to Water] Diario Constituticional (25 October 2019) available at: https://www.diarioconstitucional.cl/noticias/actualidad-legislativa/2019/10/25/presentan-reforma-constitucional-que-consagra-el-derecho-humano-al-agua/.

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

[29] Tim Stephens, 'Reimagining International Environmental Law' in L. J. Kotzé, *Environmental law and governance for the anthropocene*, (Hart Publishing, 2017), 44.

health and human culture and wellbeing, consistent with trends towards more holistic water management like the 'hydrosocial cycle' [30] and broadening of scientific approaches, which conceive of natural resources as 'socio-ecological systems'.[31]

The need to protect water for human and ecosystem health is increasingly acknowledged in a number of international and comparative legal documents. The Human Right to water, first recognised by the United Nations in 2010,[32] is primarily concerned with ensuring access to water for drinking and sanitation.[33] There is a 'remarkable gap' between the growing global consensus to recognise access to water for basic domestic purposes and legal frameworks that actually govern water access.[34] However, there is need to broaden the conceptualization of the human right to water 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, directly impacts the realisation of the human right to water, so it can be argued that the normative content of the right to water therefore entails obligations for states in terms of ensuring both water quality and quantity.[35] In this regard, the human right to water intersects with other developing areas of human rights and the environment in international and comparative law, including the right to a clean and healthy

[30] See J. Linton, 'Modern water and its discontents: a history of hydrosocial renewal', *Wiley Interdisciplinary Reviews: Water*, 1/1 (2014), 111–20.

[31] See generally L. M. Berrouet, J. Machado, and C. Villegas-Palacio, 'Vulnerability of socio—ecological systems: A conceptual Framework', *Ecological Indicators*, 84 (2018), 632–47.

[32] UN GA Agenda Item 48 A/64/L.63/Rev.1 of 26 July 2010, The Human Right to Water and Sanitation. Available at: https://undocs.org/en/A/64/L.63/Rev.1.

[33] J. Gilbert, *Natural resources and human rights: an appraisal*, First ed. (Oxford University Press, 2018), 58.

[34] M. Langford and A. F. S. Russell, *The human right to water : theory, practice and prospects*, (Cambridge University Press, 2017), 58.

[35] I. Winkler, *Human Right to Water: Significance, Legal Status and Implications for Water Allocation*, (Hart Publishing Limited, 2014), 109, 126, 197–98.

environment,[36] and the rights of Indigenous peoples over natural resources and territories.[37] International debates around human rights, the environment and water are also playing out in the emerging 'transnational'[38] trend of 'environmental constitutionalism' or 'the constitutional incorporation of substantive and procedural environmental rights, responsibilities and remedies to protect the natural environment', especially in Latin America where some of the 'most innovative and energetic' approaches to environmental constitutionalism are developing.[39]

International concern surrounding water and its numerous values and uses is captured in the 2030 Agenda for Sustainable Development and its Sustainable Development Goals, in particular SDG 6, which places pressure on states to, '[e]nsure availability and sustainable management of water and sanitation for all'.[40] The OECD has also been working on domestic prerequisites for sustainable water management, arguing that:[41]

> Well-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

[36] See generally J. H. Knox and R. Pejan, *The human right to a healthy environment*, (2018).

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

[38] See generally Jolene Lin, 'The emergence of Transnational Environmental Law in the Anthropocene' in Kotzé, *Environmental law and governance for the anthropocene* chapter 15, for a discussion of the transnational nature of environmental law in the anthropocene.

[39] E. Daly and James May (eds.), *Implementing Environmental Constitutionalism: Current Global Challenges*, (Cambridge University Press, 2018), 1, 7.

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

[41] OECD, *Water-Resources-Allocation-Policy-Highlights* (2015). Available at: https://www.oecd.org/environment/resources/Water-Resources-Allocation-Policy-Highlights-web.pdf.

> securing adequate flows to support ecosystems services; and equity by sharing the risks of shortage among water users fairly.

A widespread response to the pressures placed on the environmental qualities of rivers is to implement 'environmental flow' regimes in domestic regulatory frameworks for water.[42] Such regimes introduce the environment as a legitimate 'user' of water,[43] including for 'ecosystem services',[44] defined by Arthington as 'the tangible benefits people gain from ecosystems'.[45] '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 (e.g. an extraction cap), however, the term 'environmental flow' typically contemplates minimum in-stream flows or reserves which do not form part of the consumptive pool of water allocated to extractive use.[46] The Brisbane Declaration and Global Action Agenda on Environmental Flows of 2018 provides the following revised definition of environmental flows:[47]

> 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.

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[42] See generally Arthington, *Environmental flows: saving rivers in the third millennium*.

[43] Webb J. A. et al, 'Adaptive Management of Environmental Flows' (2018) 61(3) *Environmental Management*, at p 339.

[44] L. Nahuelhual, G. Saavedra, F. Henríquez, F. Benra, X. Vergara, C. Perugache, and F. Hasen, 'Opportunities and limits to ecosystem services governance in developing countries and indigenous territories: The case of water supply in Southern Chile', *Environmental Science and Policy*, 86 (2018), 11–18, 11

[45] Arthington, *Environmental flows: saving rivers in the third millennium*, 15.

[46] Horne A., O'Donnell E. & Tharme R.E, 'Mechanisms to Allocate Environmental Water' in Angus Webb and Avril C Horne (eds), *Water for the environment : from policy and science to implementation and management* (2017), at p 361.

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

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, however, Arthington summarises the typical approach to setting environmental flows as follows:[48]

> The majority of "in-stream flow" methods (70%; Tharme 2003) 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.

Despite the Brisbane Declaration's recognition that environmental flows support human cultures, economies and wellbeing as a component of ecosystem health, conceptual models underpinning environmental flows, until very recently, have tended to be restricted to biophysical interactions 'eschewing socio-cultural complexity, local knowledge, and governance arrangements'.[49] Advocates for 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.[50]

Human relationships with water hold particular importance for Indigenous communities who claim distinct relationships with water resources and the broader

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[48] Arthington, *Environmental flows: saving rivers in the third millennium*, 19.

[49] Michael M Douglas et al, 'Conceptualizing Hydro-Socio-Ecological Relationships to Enable More Integrated and Inclusive Water Allocation Planning' (2019) 1(3) *One Earth* at pp 361, 361. See also Jackson S. 'How Much Water Does Culture Need?' in Horne A C & Webb A (eds), *Water for the environment: from policy and science to implementation and management* (2017), at p 185.

[50] O'Donnell E. & Macpherson E. 'Challenges and Opportunities for Environmental Water Management in Chile: An Australian Perspective' (2012) 23 (1) *Journal of Water Law*, at p 24. See also M. M. Douglas, S. Jackson, C. A. Canham, S. Laborde, L. Beesley, M. J. Kennard, B. J. Pusey, R. Loomes, and S. A. Setterfield, 'Conceptualizing Hydro-socio-ecological Relationships to Enable More Integrated and Inclusive Water Allocation Planning', *One Earth*, 1/3 (2019), 361–73, 362; Arthington, *Environmental flows: saving rivers in the third millennium*, 232.

natural world,[51] and who are the repositories of valuable traditional knowledge on environmental protection.[52] Tobin explains that Indigenous rights to natural resources are 'vital for protection of their cultural integrity and their survival as distinct peoples'.[53] Typical to 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 protect their survival for future generations, as opposed to typical Western utilitarian accounts of nature as a commodity to be used.[54]

In Latin America, the rights Indigenous peoples have to natural resources, including water, have been the subject of many significant decisions of both the Inter-American Commission and Court of Human Rights who emphasise the right of Indigenous peoples to communal property over their resources in confronting resource development and extraction.[55] These decisions often refer to the protection of Indigenous territorial rights to natural resources under the International Labour Organisation's *Convention 169 on the Rights of Indigenous and Tribal Peoples*,[56] which a number of Latin American countries (including Chile) have ratified. *Convention 169*

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[51] See, eg, Hendrix B. A., 'Context, Equality, and Aboriginal Compensation Claims' (2011) 50 *Dialogue: Canadian Philosophical Review*, at p 672.

[52] Lynda Collins, 'Judging the Anthropocene' in Kotzé, *Environmental law and governance for the anthropocene*, 323.

[53] Tobin B., *Indigenous Peoples, Customary Law and Human Rights: Why Living Law Matters* (Routledge, Taylor & Francis Group, 2014), at p 141.

[54] See, eg, Bavikatte K. & Bennett T., 'Community Stewardship: The Foundation of Biocultural Rights' (2015) (1) *Journal of Human Rights and the Environment,* at p 7.

[55] Knox and Pejan, *The human right to a healthy environment*, 8. See, eg, *Mayagna (Sumo) Awas Tingni Community v Nicaragua (judgment)* [2001] Inter-American Court of Human Rights (Ser C) Case No. 79 ('*Mayagna (Sumo) Awas Tingni Community v Nicaragua (Judgment) (Inter-American Court of Human Rights, (Ser C) Case No. 79, 31 August 2001)*'); *Case of the Saramaka People v Suriname (Preliminary Objections, Merits, Reparations and Costs)* [2007] Inter-American Court of Human Rights Series C No. 172.

[56] *Convention concerning Indigenous and Tribal Peoples in Independent Countries (No. 169)* [1989] 28 ILM 1382 (entered into force 5 September 1991) *('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';[57] recognise the rights of 'rights of ownership and possession' Indigenous peoples have over their traditional territories';[58] and safeguard the rights of Indigenous peoples to 'participate in the use, management and conservation of these resources'.[59]

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 'cultural flows' have also been advocated for alongside but separate from environmental flow policies.[60] For example, the Australian National Cultural Flows Project 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'.[61] That project adopts the definition of cultural flows from the *Echuca Declaration*, as:[62]

> 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*.

[57] Ibid art 13.

[58] Ibid, art 14.

[59] Ibid, art 15.

[60] See generally S. Jackson and Marcia Langton, 'Trends in the Recognition of Indigenous Water Needs in Australian Water Reform: the Limitations of "Cultural" Entitlements in Achieving Water Equity', *Journal of Water Law*, 22/2/3 (2012), 110.

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

[62] Murray Lower Darling Rivers Indigenous Nations and Northern Murray–Darling Basin Aboriginal Nations, *Agreed Definition of Cultural Flows*, available at: http://www.mdba.gov.au/explore-the-basin/communities/indigenous-communities/.

The idea of 'cultural flows' has emerged from Australia as an attempt by Indigenous communities to leverage off government support of environmental flows for specific Indigenous interests,[63] and ensure that an adequate flow of the river is set aside for Indigenous values or uses in water planning. However, there has also been criticism of 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.[64] Until recently, cultural flows have enjoyed little response from governments, 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 focus on the need for substantive water rights or allocations for Indigenous peoples to use water for any purpose they may wish to, including commercial use.[65]

A recent article by Douglas et al helpfully emphasises the diverse uses 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.[66] The authors identify a 'need to recognize Indigenous and non-Indigenous governance and management systems at multiple scales

[63] Jackson, n. **Error! Bookmark not defined.** above, at p 181.

[64] Jackson S. & Langton M., '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*, at p 110. See also Ibid at p 183.

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

[66] Douglas, Jackson, Canham, Laborde, Beesley, Kennard, Pusey, Loomes, and Setterfield, 'Conceptualizing Hydro-socio-ecological Relationships to Enable More Integrated and Inclusive Water Allocation Planning', 363.

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'.[67]

For the reasons emphasised by Douglas et al, we consider that it is important that any environmental flow regime 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.[68] The idea of involving Indigenous peoples' governance and accounting for their rights in environmental flows is not at the expense of, and should be considered complementary to, the need for consumptive rights for Indigenous peoples to take water for any (including commercial) purposes. As Jackson puts it:[69]

> 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.

3. CHILE: A COUNTRY OF RIVERS

Chile is a long and narrow country,[70] and water resources and demand are unequally distributed throughout its 101 water basins. Chile's hydrography presents particular

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[67] Ibid 362.

[68] Macpherson E., *Indigenous Rights to Water in Law and Regulation: Lessons from Comparative Experiences* (Cambridge University Press, 2019) at pp 221–40.

[69] Jackson, n. **Error! Bookmark not defined.** above, at p 181.

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

challenges for water regulation, with varying climate and geography across the territory influencing different freshwater ecosystems in different ways. Chile's economy depends on a reliable supply of water for water intensive activities like agriculture, agroforestry, fisheries and mining, which (when combined) total almost 70 per cent of the country's exports.[71] These activities present ever-increasing threats to the quality and the availability of water resources for environmental and social uses.[72]

In July 2016, the OECD released an Environmental Performance Review for Chile.[73] The report recognises both the significance of many Chilean regions in terms of global biodiversity, and the intense pressure on natural resources in the context of 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.[74] To compound this, the actual state of many of Chile's rivers is unknown, due to 'partial and unsystematic' information collected and maintained on the condition of aquatic ecosystems.[75]

Alongside the environmental degradation of Chile's water resources, Chile has experienced a growth in water-related social conflict in recent years, between different

[71] World Bank, *Report N PAD1275 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* (2015), at pp 10-11.

[72] Babidge and Bolados, 'Neoextractivism and Indigenous Water Ritual in Salar de Atacama, Chile'; Bauer, 'Dams and Markets: Rivers and Electrical Power in Chile'.

[73] Organisation for Economic Co-operation and Development and Economic Commission for Latin America and the Caribbean, *Environmental Performance Reviews: Chile 2016 (2016) ('Environmental Performance Reviews').* 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 and biodiversity conservation and sustainable use.

[74] Ibid, at pp 61-2.

[75] Riestra F., 'Environmental Flow Policy' in Donoso G (Ed.) *Water Policy in Chile*, Global Issues in Water Policy (Springer, 2018) at p 113.

user groups with differing water values and competing demands.[76] Bauer has helpfully characterised these conflicts into four basic types (paraphrased below):[77]

- River basin conflicts, particularly in central and southern Chile, involving multiple users of surface water, with hydropower often being the driving factor.
- Conflicts about overexploited 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.
- Conflicts that are not directly about conflicting water uses but 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 per cent relate to the energy productive sector and 28 per cent to mining activities.[78] Specifically in relation to conflicts over water, a 2010 report by environmental NGO Chile Sustentable reported 26 conflicts across the country.[79] According to this data, in the north one out of thirteen conflicts is linked to mining projects, in the central region four out of six conflicts

[76] Marín, 'Constitutional Challenges of the South: Indigenous Water Rights in Chile - Another Step in the "Civilizing Mission?', 97. García A., '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 Dessert) and Baker (Austral Patagonia) River Basins] (2009) 18(4), *En foco: Medio Ambiente, Sociedad y Desarrollo Sustentable,* at p 695.

[77] Bauer, 'Water conflicts and entrenched governance problems in Chile's market model', 154.

[78] Mapa de Conflictos Sociales en Chile [Map of Environmental Conflictss in chile] available at: https://mapaconflictos.indh.cl/#/ .

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

concern energy and hydropower developments, and in the southern region six out of seven are due to 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 is the Loa river basin in the north of Chile where water extractions for mining have had the effect of displacing local Indigenous agriculture.[80] At the beginning of the twentieth 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.[81] 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.[82]

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 as a 'scarcity zone',[83] and water is now regularly trucked in for drinking water.[84] Due to increasing water scarcity in northern and central Chile, private

[80] See Calderón M., Benaviedes C. Carmona J. Halvez D., Maleran N., Rodriguez M. & Sinclaire D., '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*, at pp 298-299.

[81] Including the Aymara, Atacameñas, Collas, Diaguitas y Quechua. See Babidge, 'Contested value and an ethics of resources: Water, mining and indigenous people in the Atacama Desert, Chile'.

[82] See generally Babidge and P. Bolados, 'Neoextractivism and Indigenous Water Ritual in Salar de Atacama, Chile', *Latin American Perspectives*, 45/5 (2018), 170–85; F. M. Camacho, 'Competing rationalities in water conflict: Mining and the indigenous community in Chiu Chiu, El Loa Province, northern Chile', *Singapore Journal of Tropical Geography*, 33/1 (2012), 93–107.

[83] As at October 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 y del Maule in Dirección General de Aguas, Decretos declaración zona de escasez vigentes, available at: http://www.dga.cl/administracionrecursoshidricos/decretosZonasEscasez/Paginas/default.aspx, last visited 27 November 2019.

[84] Budds J., 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 Managament of Water in the Context of Scarcity: an Analisis of the Hidrosocial Cycle of the Valley of La Ligua River, Chile] (2012) (52) *Revista de Geografía Norte Grande*, at p 173; in Bolados P., Henriquez F., Ceruti C.,

companies seek increasingly inventive ways to access water for their commercial activities, including developing major projects for desalinization of seawater.[85]

In stark contrast to the dry and over-allocated north, the south of Chile experiences high levels of rainfall enabling a greater surface recharge, as well as having lakes, rivers, snow and glaciers that act as important water reserves, meaning that availability of water is higher than demand.[86] The socio-environmental conflicts in these regions have historically been linked to major hydropower development,[87] and the need to protect freshwater resources maintaining the state of free-flowing rivers.[88] One of the most controversial water conflicts in Chile's south concerned the (now discontinued)[89] Hydroaysen mega-project; [90] a 2.750-megawatt hydroelectric power development project comprising five dams in Patagonia - three on the Pascua river, and two on the

Cuevas A., '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*, at pp 167, 181. See also Bauer, 'Water conflicts and entrenched governance problems in Chile's market model', 158.

[85] Servicio de Evaluación Ambiental, Sistema de Evaluación de Impacto Ambiental, available at: http://seia.sea.gob.cl/busqueda/buscarProyectoAction.php?nombre=desalinizadora, last accessed 27 November 2019. Cereceda P., Schemenauer R., & Valencia R., 'Posibilidades de Abastecimiento de Agua de Niebla en la Región de Antofagasta, Chile' [Posibilities of Provisioning of Water from Fog in the Region of Antofagasta, Chile] (1992) 19, *Revista de Geografía Norte Grande*, at p 3.

[86] Valdés-Pineda, Pizarro, García-Chevesich, Valdés, Olivares, Vera, Balocchi, Pérez, Vallejos, Fuentes, Abarza, and Helwig, 'Water governance in Chile: Availability, management and climate change'.

[87] For an analysis of the interaction of water and energy law frameworks in Chile see Bauer, 'Dams and Markets: Rivers and Electrical Power in Chile'.

[88] See Bauer, 'Water conflicts and entrenched governance problems in Chile's market model', 159; D. Tecklin, C. Bauer, and M. Prieto, 'Making environmental law for the market: the emergence, character, and implications of Chile's environmental regime', *Environmental Politics*, 20-File Attachments| (2011), 879–98.

[89] 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.

[90] See generally A. Berrizbeitia and T. Folch, 'Colonizar las últimas fronteras: el potencial de los paisajes de energía en la Patagonia chilena', *ARQ (Santiago)*, (2015), 22–29. 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, 31 October 2017, R-40-2014).

Baker river.[91] 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 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 urbanisation. 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.[92] Examples of this are the Pehuenche-Mapuche Indigenous opposition to the Ralco dam development in the South of Chile,[93] and resistance to the Pascua Lama gold mining project by the Diaguita Huascoaltino Indigenous communities of northern Chile.[94]

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[91] Chile's largest river by volume of water. Instituto Nacional de Estadisticas, available at: https://www.ine.cl/bases-de-datos.

[92] See Lovera D., 'Indigenous Peoples and the Sale of Water Rights: The Case of Chile' in Malcolm Langford and Anna FS Russell (eds), *The Human Right to Water: Theory Practice, and Prospects* (Cambridge University Press, 2017), at pp 84–112.

[93] See Lila 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*. See also Davis, 'Indigenous Rights and Modern Water Management in Chile', 8.

[94] See Aguilar G., 'Pascua Lama, Human Rights and Indigenous Peoples: A Chilean Case Through the Lens of International Law' (2013) 5 *Gottingen Journal of International Law* at pp 215, 245–246 Fuentes R., *'No Se Toman En Cuenta Los Actos Positivos de La Empresa: La Defensa de Pascua Lama Para Evitar Su Cierre',* 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 Haslam P. A., 'The Two Sides of Pascua Lama', 2018 (106) *European Review of Latin American and Carribean Studies* at p 157. 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.

Looking to the future, Chile is highly vulnerable to the impacts of climate change, and it has been acknowledged that Chile's main challenge in terms of climate change mitigation, adaptation and resilience concerns the use and management of freshwater resources.[95] The latest data, from the World Resources Institute, places Chile 18th amongst the World's countries under water stress, with a 'high baseline of water stress';[96] 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' (discussed below), and the lack of institutional capacity or willingness to regulate, undermine the potential for transformative change needed to secure the protection of freshwater resources for present and future generations. In this context, and in the context 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 FRAMEWORKTHE LEGAL FRAMEWORK FOR WATERSince the time of Spanish colonisation, Chile's political and social history has been characterised by ideological extremes and constitutional contrasts, including socialist governments focused on progressive social reform from the late 1960s and a conservative (and later neoliberal) military

[95] Santibáñez F., *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) at p 52.

[96] Willem R., Reig P. & Schleifer L., 17 Countries, Home to One-Quarter of the World's Population, Face Extremely High Water Stress, World Resources Institute (6 August 2019) https://www.wri.org/blog/2019/08/17-countries-home-one-quarter-world-population-face-extremely-high-water-stress.

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.[97]

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,[98] and accompanied by rapid growth in water related development such as mining and hydroelectricity.[99] The new approach to water regulation, enshrined in a new *Water Code* of 1981, combined centralised water regulation with trade in water rights (called '*derechos de aprovechamiento'*), which could be transfered independent 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).[100] However, the same declaration of water as public property allows the government to grant rights to use water, which amount to (constitutionally protected) private

[97] For a full discussion of the legal, political and social historical context to 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)]', *Revista de Derecho de Minas y Aguas*, 1 (1989), 118.

[98] Marín, 'Constitutional Challenges of the South: Indigenous Water Rights in Chile - Another Step in the "Civilizing Mission?', 88.

[99] See generally Bauer C., *Siren Song: Chilean Water Law as a Model for International Reform* (Resources for the Future, 2004) at p 4; C. J. Bauer, *Against the Current: Privatization, Water Markets, and the State in Chile*, (Springer, 1998).

[100] *Codigo de Aguas [Water Code]* 1981 ('*Water Code')* art 5.

property,[101] equivalent to rights of absolute ownership.[102] In fact, water rights enjoy the strongest form of property right available under Chilean law,[103] described as an absolute, exclusive, and perpetual right to use, enjoy and dispose of a thing.[104] The status of water rights differs greatly from rights to other resources in comparative Chilean concessional regimes,[105] 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 General Water Directorate under the *Water Code* by way of an administrative concession, provided the applicant satisfies a number of formal and substantive requirements,[106] including proving the 'availability of the resource'.[107] They may also be 'recognized', either based on historical titles or via the judicial process of regularization, requiring applicants to prove uninterrupted productive use[108] of the water since five years before the commencement of the *Water Code* (i.e. 1976), 'without force or illegality', and 'without recognising the rights of others',[109] in a process reminiscent of the doctrine of adverse possession at common law.[110] The regularization process was originally

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[101]*Constitución Política de La República de Chile [Political Constitution of the Republic of Chile] 1980* ('*Constitution*') art 19(24).

[102]See *Código Civil de La República de Chile [Civil Code of the Republic of Chile] 1855* ('*Civil Code*') (Chile), at art 589(2) for the incidents of ownership or '*propiedad*' in Chilean civil law.

[103] Ibid art 577.

[104] Ibid art 582.

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

[106] *Water Code* art 20. See generally, Vergara A., *Derecho de Aguas [Water Law]* (Editorial Jurídica de Chile, 1998) Vol II, at p 321.

[107] *Water Code* art 141.

[108] *Decree Law 2.603 1979.*

[109]*Water Code* trans art 2.

[110] The Chilean Courts have applied the process of regularisation in conjunction with article 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. See, eg, *Comunidad Atacamena Toconce con Essan SA* [2004] Corte Suprema [Supreme Court] No. 4064-2004 (Chile), at p 6 ('*Toconce*').

intended to be a transitional measure to encourage a complete water register necessary to encourage water markets after the enactment of the 1981 *Water Code*, however regularization cases have continued. The regularization process has in parts of Chile been used to recognise the customary water rights of Indigenous communities as well as ongoing use by other historical users and register their water rights,[111] discussed below, which presents particular challenges for forward water planning. Finally, already allocated water rights may be purchased from other users by private bargaining in water markets.

Water use rights are merely classified as 'consumptive' or 'non-consumptive',[112] 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. Since an amendment in 2005, there has been a requirement in articles 131-2 of the *Water Code* to explain 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, say from small-scale agriculture to mining or eco-tourism to hydro generation, although such changes in use are understood to be rare in practice as are market transfers.[113]

The status of freshwater resources as 'national goods for public use' has typically been construed as meaning that, rather than being directly owned, they are allocated by

[111] See generally Macpherson, n. **Error! Bookmark not defined.** above, at pp 176–200. See also Agüero F, Costa E. & Garcia V., '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 N° 28, Centro de Regulación y Competencia, Universidad de Chile, 29 July 2013), at p 44.

[112] Ibid art 12, 13. A 'consumptive' water allows its holder to totally consume the waters in any activity'.

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

the government pursuant to a concessional regime for their use and management.[114] However, the General Water Directorate has few regulatory powers for water, which it exercises sparingly.[115] 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 organisations known as *Juntas de Vigilancia* (Water Monitoring Boards).[116] 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'.[117] According to Rojas Calderón, these private Boards have the 'public' function of managing river distribution and health across the whole catchment,[118] and Vergara argues that they have general powers for the governance and conservation of rivers,[119] although as corporate entities accountable to private users as shareholders, it is doubtful that this public interest overrides any private benefit.[120]

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

[114] Vergara & Rivera, n. **Error! Bookmark not defined.** above, at 111, 118.

[115] Bauer, *Siren Song: Chilean Water Law as a Model for International Reform*.

[116] *Water Code*, art 268. There are also 'canal user associations' for canalized rivers.

[117] See E. O'Donnell and E. Macpherson, 'Voice, power and legitimacy: the role of the legal person in river management in New Zealand, Chile and Australia', *Australasian Journal of Water Resources*, (2018), 1–10, 5 for further discussion on the Boards and environmental water management.

[118] Christian Rojas Calderón, 'Autogestión y Autorregulación Regulada de Las Aguas: Organizaciones de Usuario de Aguas (OUA) y Juntas de Vigilancia de Ríos' (2014) 20(1) *Ius et Praxis* 123.

[119] A. Vergara Blanco, 'Autogobierno en la gestión de las aguas en Chile', *crisis del agua en el perú*, (2014), 195.

[120] M. Prieto and C. Bauer, 'Hydroelectric power generation in Chile: an institutional critique of the neutrality of market mechanisms', *Water International*, 37/2 (2012), 131–46; O'Donnell and Macpherson, 'Voice, power and legitimacy: the role of the legal person in river management in New Zealand, Chile and Australia', 6.

government interference'. [121] There is also a particular productivist logic to the government's limited approach to regulation, which emphasises economic efficiency at the expense of environmental, social or cultural outcomes. Nahuelhual et al 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'.[122] 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'.[123]

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 established under the *Water Code* was established there was no specific allocation of water to the environment and no reference to environmental flows.[124] This was despite the fact that Chile's Constitution protects:[125]

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[121] Bauer, 'Water conflicts and entrenched governance problems in Chile's market model', 149. But see Prieto and Prieto, 'Bringing water markets down to Chile's Atacama Desert'. 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.

[122] Nahuelhual, Saavedra, Henríquez, Benra, Vergara, Perugache, and Hasen, 'Opportunities and limits to ecosystem services governance in developing countries and indigenous territories: The case of water supply in Southern Chile', 16.

[123] Nahuelhual, Saavedra, Henríquez, Benra, Vergara, Perugache, and Hasen, 'Opportunities and limits to ecosystem services governance in developing countries and indigenous territories: The case of water supply in Southern Chile', 16.

[124] Environmental concerns were only introduced into Chile's water law frameworks indirectly, with the passage of the *Ley Sobre Bases Generales de Medio Ambiente 1994 (N° 19.300) (Environmental Law),* discussed below, which 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.

[125] *Constitución Política de la República de Chile [Political Constitution of the Republic of Chile]*, (1980) art 19(8).

> The right to like 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.
>
> The law may establish specific restrictions on certain rights or freedoms in order to Project the environment.

The constitutional protection of environmental rights has been interpreted in the Chilen scholarship as requiring the State to react appropriately to activities that undermine the preservation of nature,[126] and take action before any infringement, enshrining a 'precautionary approach' in Chilean environmental law.[127]

The lack of an express legislative requirement for minimum ecological flows did not preclude their establishment, and the General Water Directorate began creating them for specific projects or activities as early as 1982,[128] with different criteria applied depending on the area to be protected or the characteristics of the case.[129] 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 an amount of water that must 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.[130]

In the absence of an express provision, the General Water Directorate relied on a number of regulatory powers with respect to water as implied authority to establish the

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[126] Lorna Püschel, *Deberes Constitucionales Estatales en Materia Ambiental* [State Constitutional Duties in Environmental Matters] (LegalPublishing, Santiago, 2010) at p 137.

[127] Galdamez L., 'Medio Ambiente, Constitución y Tratados en Chile' [Environment, Constitution and Treaties in Chile] (2017) 148, *Boletín Mexicano de Derecho Comparado* at pp 113, 124.

[128] Riestra F., 'Environmental Flow Policy' in Donoso G (Ed.) *Water Policy in Chile*, Global Issues in Water Policy (Springer, 2018) at p 106.

[129] For example General Water Directorate Resolution N° 63, established a minimum ecological flow of 1,4 m3 p/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.

[130] Riestra, n. 128 above, at pp 103, 107.

first minimum flows. These included, foremost, the constitutional right to a clean and healthy environment, discussed above. The Directorate also took authority from the public interest in water management, given the status of waters as *bienes nacionales de uso público* (national property of public use) under the *Water Code* and *Civil Code.*[131] The General Water Directorate 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 Directorate ordered the first Chilean study on environmental flows in 1993,[132] 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, reached no accepted methodology on how to determine minimum environmental flows, and states that the choice of specific method and technology will depend on the circumstances of the case.[133]

The power of the Directorate 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

[131] See generally Vergara A. y Rivera D., 'Legal Institutional Frameworks of Water Resources' in Donoso G. (Ed.) *Water Policy in Chile*, Global Issues in Water Policy 21 (2018) at p 111.

[132] 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.

[133] Ibid, at p 124.

a technical report commissioned by the Directorate in May 2003 concluded that now new water rights should be created in the three sections of the Maipo river and recommended the establishment of minimum ecological flows.[134]

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*.[135] 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 Directorate 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 Directorate had no power to refuse the application, as the applicant had satisfied all requirements of the *Water Code,* and in particular that the Directorate had no power 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 Directorate's power to refuse the application for a water right, as there was insufficient water available for the right to be granted.[136] In doing so, the Court emphasised the right to a clean and healthy environment in article 19(8) of the Constitution,[137] and pointed to the requirement for public authorities to protect conservation and biodiversity in articles 41 and 42 of the

[134] Dirección General de Aguas, '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 Freswater Resources in the Waterbasin of Maipo River. Report Developed by the Departament of Managament of Freswater Resources] Report S.D.T N° 145 (May 2003).

[135] *Aguas Chacabuco v Dirección General de Aguas*, Supreme Court, Rol: 4224-2004 (31 October 2005) (Chile).

[136] *Aguas Chacabuco v Dirección General de Aguas* [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.

[137] *Aguas Chacabuco v Dirección General de Aguas* [6].

Environmental Law (referred to below), as well as a general and inherent power for the Directorate to set aside minimum flows under the *Water Code.*[138]

The second case was the 2006 Supreme Court decision *Olga Prieto Poklepovic v Dirección General de Aguas*,[139] concerning an application for a right to take and use water from the Mapocho River, a tributary of the Maipo. Based on the May 2003 technical report, the Directorate 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 Directorate's power to deny the application and maintain minimum ecological flows, explaining:[140]

> …in 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.

Minimum flows have also been established under the *Environmental Law*, passed in 1994 (here referred to as 'environmental flows' to distinguish them from minimum ecological flows set by the Directorate).[141] Article 41 of the *Environmental Law*

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[138] *Aguas Chacabuco v Dirección General de Aguas* [8].

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

[140] *Olga Prieto Poklepovic v Dirección General de Aguas* [12].

[141] Ley 19.300 Sobre Bases Generales del Medio Ambiente 1994 [Law 19.300 on General Environmental Standards 1994] (Chile) (*Environmental Law*).

established that natural renewable resources (which, for the purposes of the Law, includes water) must 'be used in a way that ensures their potential to regenerate and their associated biological diversity'.[142] Article 42 goes on to require the Ministry for the Environment and all public organisms 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.[143]

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 (called an environmental qualification resolution or 'RCA').[144] 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 Assessments] 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 authorised to set minimum environmental flows, as mitigation measures.[145] For example, in the hydroelectric Project

[142] *Environmental Law* art 41.

[143] Ibid art 10, 11.

[144] Ibid art 10.

[145] The project developer may also undertake to establish minimum environmental flows as a voluntary commitment.

Perquilauquén, in the Biobío region, the Service established minimum environmental flows and additional water rights (0,109 m3/s) that the company will have to leave in-stream for other downstream users (called a '*caudal pasante*').[146] Since 2016, the Service has operated under a specific guideline for setting environmental flows for hydroelectric projects,[147] 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, in distinction from the minimum ecological flows set by the DGA, which are based only on hydrological criteria.[148]

The Service's power to institute minimum environmental flows has been criticised, on the basis that it duplicates the functions of two separate government institutions and creates ambiguity around the nature and scope of environmental flows.[149] In practice, however, the Service has rarely departed from the approach for setting proposed minimum ecological flows recommended by the General Water Directorate,.[150] At the same time, the Service is not legally bound by the current limits

[146] 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, 26 September 2014) https://infofirma.sea.gob.cl/DocumentosSEA/MostrarDocumento?docId=f9/84/d9c54c9f3f06ad7fd6634fa9e2f2bfb355ec.

[147] 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.

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

[149] Jaeger P., 'Caudales ecológicos mínimos y proyectos hidroeléctricos' [Minimum Ecological Flows and Hydroelectric Proyects], in Derecho Ambiental en Tiempos de Reforma. Acta de las V Jornadas de Derecho Ambiental (Universidad de Chile, 2010) at p 21.

[150] See, eg, Project Reservoir Illapel 1999; Project Reservoir Corrales 1998; Project Convento Viejo Etapa II 2004: Project Hydroelectric Power Station Higuera 2004; Project Hyroelectric Power Station Quilleco 1998, 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], 2011 available at: http://observatoriaigua.uib.es/repositori/gf_caudales_calculo.pdf.

imposed by the Directorate for minimum ecological flows,[151] 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 Directorate's methodology in determining minimum environmental flows.

Since 1994, the General Water Directorate 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 only grant future applications for water rights for flows above this level.[152] In 2002, the Directorate passed a regulation entitled the 'Manual of Regulation and Procedures for the Management of Freshwater Resources' to provide detailed guidelines around the setting of environmental flows, including a hydrological method for determining minimum ecological flows.[153] The method typically requires a minimum ecological flow of ten per cent of the annual average flow and 50 per cent of the minimum dry season flow across the 95th percentile of years (Q 95 per cent).[154]

In 2005, after thirteen years of debate before the Parliament, a reform to the *Water Code* was finally passed (*Law N° 20.017*).[155] The amendment was hard-won, with pro-market right-wing interests in fierce opposition to left-wing proponents of more interventionist reforms.[156] Without altering the neoliberal ideology behind the *Water*

[151] Which (discussed below) is typically 20 per cent of the average annual flow rate in the corresponding watercourse.

[152] Riestra, n. 128 above, at pp 103, 108.

[153] General Water Directorate (DGA) *Resolución Exenta DGA N° 1503*, 31 May 2002. The Resolution aproves the 'Manual for the Norms and Procedures for the Administration of Water Resources'.

[154] See generally Boettigger, n. **Error! Bookmark not defined.** above for further explanation of the methods for setting flows.

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

[156] See generally C. J. Bauer, 'In the Image of the Market: the Chilean model of water resource management', *International Journal of Water*, 2 (2005), 146–65.

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 Directorate had followed since 1982. New article 129 bis 1 of the *Water Code*, provided that:

> in granting water rights, the General Water Directorate should ensure nature's preservation and environmental protection, establishing to that end a minimum ecological flow, that 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 per cent of the average annual flow rate in the corresponding watercourse.[157] The amendment also provided an exception allowing the President of the Republic, following a favourable report of Ministry of Environment, to issue a Decree specifying a different minimum ecological flow, which could be higher than the legal limit of 20 per cent, but less than 40 per cent of the average annual flow rate in the corresponding watercourse.[158]

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 Directorate (in the 2002 Manual). However, in 2008 the Directorate approved a new Manual for 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 Directorate to apply a minimum ecological flow. The Directorate did so by applying a broad interpretation of article 163 of the *Water Code*, which provides that approval is required to change the

[157] *Water Code* art 129 bis 1 para 2.

[158] *Water Code* art 129 bis 1, final para.

location of a water collection or extraction point. This interpretation was controversial and has been challenged more than once in court.[159] However, the Supreme Court in the 2012 case of *Sergio Menichetti Cuevas v Dirección General de Aguas* agreed with the approach taken by the General Water Directorate in setting minimum ecological flows in relation to a request for a change of capture point, and emphasised the important role the Directorate should play in protecting freshwater resources, as follows:[160]

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

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 Directorate.[161] The 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.[162] Given that most river basins in the North and Central

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[159] See generally Boettiger C., 'Caudal Ecológico o mínimo: regulación, críticas y desafíos' [Ecological or minimal flow, regulation, critics and challengues] (2013) 3 *Actas de Derecho de Aguas*Boettiger, n. **Error! Bookmark not defined.** above; Vergara A., 'Estatuto Jurídico de la Fijación de Caudales Mínimos o Ecológico' [Legal regime to determine the minimum or ecological flows] 1999 1 (1) *Revista de Derecho Administrativo Económico,* at p 127.

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

[161] See generally Bauer, 'Water conflicts and entrenched governance problems in Chile's market model'.

[162] For evidence of this in Parliamentary debates see, eg, Project to reform the Water Code, Bulletin N° 7543-13, available at https://www.senado.cl/appsenado/templates/tramitacion/index.php?#.

parts of Chile were fully allocated, and in some cases overallocated,[163] 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.[164]

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,[165] designed to protect against water speculation and ensure parties who hold the rights to make use of them for their stated purpose.[166] 'Non-use' is assumed where there are no water capture works,[167] such as canals or irrigation systems, and a number of provisions in the *Water Code* set out the process for charging the taxes. For 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.[168] 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 also been challenged in the courts, generally by those seeking exceptions,

[163] Budds J. `Power, nature and neoliberalism: The political ecology of water in Chile' (2004) 25(3) *Singapore Journal of Tropical Geography* 322, at 42. Budds J. states that surface water rights in Chile reached 'exhaustion' in the mid-1990s.

[164] See also Riestra, n. 128 above, at p 103.

[165] *Water Code* art 129 bis 4.

[166] 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.

[167] *Water Code* art 129 bis 9.

[168] *Water Code* art 129 bis 4.

or the expansion of existing exception categories,[169] including in the case of Indigenous communities under the *Indigenous Law*, discussed below.

Where minimum flows can be established, there are a number of 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 Directorate 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 right 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 penalise unlawful use). However, the General Water Directorate has incomplete data on the actual state of waterways or their users in Chile for a number of reasons. These include because, as mentioned above, water rights can come into being not only via administrative grant, but also where recognised by the courts in the process of regularization, which may retrospectively recognise 'historical' water users as legitimate rightholders, without any prior accounting. Further, many historical water users resist regularizing their water rights with the Directorate's Public Cadastre of Water to avoid being levied fees for non-use, despite campaigns by the Directorate to encourage regularizations, meaning that 'illegal' water use is widespread.[170] Water rights are also transferable within water markets, and

[169] See generally Rivera D. & Vergara A., 'Derechos de Aguas, Comentario de la Jurisprudencia de la Corte Suprema 2011-2014, Patente por non uso de aguas. Aplicación práctica y conflictos interpretativos.' [Water Rights, Commentary of Supreme Court Jurisprudence 2011-2014, Non-use Tarrifs. Practical application and interpretation conflicts] Facultad de Derecho Pontificia Universidad Católica de Chile. Available at http://derechoygestionaguas.uc.cl/images/PDF/Patente-por-no-uso-de-aguas.pdf.

[170] A. Vergara Blanco, 'Comentario: regularización de derechos de aguas y publicidad en el uso de las mismas [Commentary : regularisation of water rights and publicity of their use]', *Revista de Derecho de Aguas*, VII (1996), 254.

there is no enforceable mechanism to register water rights and transferences, making it extremely difficult for the water authority keep track of many of them.[171]

Second, under the current regime, new water users bear the burden of ensuring minimum flow rates in order to protect freshwater ecosystems. Established water right holders continue using 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 drought and climate change present, diminishing considerably the amount of water available in the riverbed. Politicians, industry and productive sectors continue to resist any sort of redistribution or abrogation of water rights, pointing to 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 was, in effect, an expropriation of private property rights.[173]

Chilean environmental institutions have also conceived of and developed environmental flow methodologies and policies in a particularly limited way. The Brisbane Declaration defines environmental flows as not only 'the quantity, timing and quality of freshwater flows and level necessary to sustain aquatic ecosystems', but as supporting other uses, including cultural uses and well-being.[174] However, the Chilean minimum flows framework has much more limited objectives geared towards the 'preservation of nature' and 'to establish the natural conditions relevant to each

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172 Boettiger, n. **Error! Bookmark not defined.** above, at p 9.

173 Celume, n. **Error! Bookmark not defined.** above, at p 318.

174 Ibid.

superficial flow'.[175] The focus in Chile has been only on the minimum amount of water 'needed' in the river, with no reference to quality, and excluding other factors that could influence that ecological value, like landscape, tourism, social or cultural uses,[176] relevant to enhance the river's value more broadly. Nor does the hydrological method used by the General Water Directorate account for the interaction of surface water resources with groundwater, necessary for an accurate understanding of complete aquatic ecosystems.

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 per cent of the average annual flow rate in the corresponding watercourses or 40 per cent 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 per cent average annual flow rate, may in fact be necessary or desirable to restore and ensure a healthy river ecosystems and uses of the water flowing through it.

4.3 Indigenous Water Rights and Implications for Environmental Flows

As well as concerns about the environmental state of Chile's rivers, there is growing concern voiced by Indigenous communities about the unfair distribution and poor

[175] *Water Code* art 129 bis 1.

[176] Celume, n. **Error! Bookmark not defined.** above, at 313.

[177] Ibid.

management of Chile's water resources.[178] The Chilean Indigenous population makes up approximately 12.8 per cent of the total population, within nine Indigenous ethnicities recognised by the *Indigenous Law,*[179] all of which are culturally and linguistically distinct.[180] 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 recognised, to a limited extent, in domestic and international law, including *ILO Convention 169,* which Chile has ratified.[182]

Indigenous relationships and interests with 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]

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[178] See Lovera Parmo, above n 92.

[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 (Establish Norms for the Protection, Creation and Development of the Indigenous, and to Create the National Corporation of Indigenous Development)] 1993* ('*Indigenous Law*').

[180] 'Instituto Nacional de Estadísticas Chile, 'Síntesis de Resultados Censo 2017' [Synthesis of Census Results 2017] at 16. Available at http://www.censo2017.cl/descargas/home/sintesis-de-resultados-censo2017.pdf. See Macpherson, n. **Error! Bookmark not defined.** above, at p 163. The 2,185,792 people that 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, 'Constitutional Challenges of the South: Indigenous Water Rights in Chile - Another Step in the "Civilizing Mission?', 107–9.

[181] J. Aylwin, *Pueblos Indigenas de Chile: Antecedentes Historicos y Situacion Actual [Indigenous Comunities of Chile: History and Current Situation],* (Instituto de Estudios Indigenas Universidad de la Frontera, 1994), vol. i; R. J. Miller, 'The International Law of Discovery, Indigenous Peoples, and Chile', *Nebraska Law Review*, 89 (2010), 819.

[182] Although Chile is also often criticised for poor implementation of the Convention. See, eg, Aguas J. & Nahuelpan H., '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* 0; Fuentes C. & Cea M, 'Reconocimiento Débil: Derechos de Pueblos Indígenas En Chile [Weak Recognition: Indigenous People's Rights in Chile]' (2017) 25 *Perfiles Latinoamericanos,* at 55.

[183] See E. Getman, 'Defining the "value" of water : an ideological clash between Chile's indigenous peoples and corporate powers', 2009. Barrera-Hernández L., '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*. See Prieto and Prieto, 'Bringing water markets down to Chile's Atacama Desert', 192. Manuel Prieto, 'Privatizing Water and Articulating Indigeneity: The Chilean Water Reforms and the Atacameño People (Likan Antai)', The University of Arizona 2014;

According to Babidge, who has conducted recent anthropological research on Indigenous communities' water use and interactions with mining companies and government in northern Chile, Indigenous water interests are characterised 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' (or '*caudal cultural*' in Spanish) is not used in Chilean law or commentary, although there is some acknowledgment of the social or cultural dimensions of the environment in in the Chilean legal framework. The *Environmental Law*, for example, defines the 'environment' as:[185]

> The 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.

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

Castro M., Bahamondes M., Albornoz P., Basaure M. F., Cayo S. B, Larama S., Hidalgo R., *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).

[184] Babidge, 'Contested value and an ethics of resources: Water, mining and indigenous people in the Atacama Desert, Chile', 85.

[185] *Environmental Law* art 2 (ll).

[186] See generally Macpherson, n. **Error! Bookmark not defined.** above, at pp 161-213.

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

> 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 of ownership and use of the Indigenous communities, without prejudice to the rights that other right holders have registered in accordance with the Water Code.
>
> New water rights must not 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 protected as property by the Constitution.[188] Consistent with typical conceptions of Indigenous resource rights in international debates, the rights recognised 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

[187] Macpherson, *Indigenous Rights to Water in Law and Regulation: Lessons from Comparative Experiences*, 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*') at [7] and *Comunidad Atacamena Toconce con Essan SA* [2004] Corte Suprema [Supreme Court] No. 4064-2004 (Chile), at p 6 ('*Toconce*').

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 recognise 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 1993* 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, ancestral water rights have typically been recognised in reliance on article 64 for the consumptive use of surface waters only, due to the difficulty of proving productive use that is non-consumptive or involves groundwater in the absence of water infrastructure.[194] Indigenous communities would be unlikely to be successful 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]

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[189] Manuel Prieto, 'Privatizing Water and Articulating Indigeneity: The Chilean Water Reforms and the Atacameño People (Likan Antai)', The University of Arizona 2014, 231.

[190] Macpherson, n. **Error! Bookmark not defined.** above, at p 177.

[191] Research by Manuel Prieto also reveals that regularizations of the water rights of northern Indigenous communities also occurred prior to the *Indigenous Law* using the regularization process, as earlya s 1983. These communities may not, at the time, have identified as Indigenous. See Manuel Prieto, 'Privatizing Water and Articulating Indigeneity: The Chilean Water Reforms and the Atacameño People (Likan Antai)'.

[192] The Chilean Courts have applied the process of regularisation in *Water Code* trans art 2 in conjunction with article 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, eg, *Toconce,* at 2; *Chusmiza Supreme Court Decision* [10].

[194] Macpherson, n. **Error! Bookmark not defined.** above at pp 195-6.

[195] Ibid.

Because much of the surface flows of Chilean rivers had already been fully allocated by the time the *Indigenous Law* was enacted, the Law also set up a redistributive measure; a Fund to finance the acquisition of water rights for Indigenous communities (the Indigenous Land and Water Fund).[196] This includes funding regularization cases, and the necessary production of expert evidence and legal and court fees, but the Fund has been also used to finance the constitution and purchase of water rights for Indigenous groups throughout Chile. Like ancestral water rights protected by article 64, water rights acquired with the support of the Fund are the same as 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 only benefitted from the Fund 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 specifically refer 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 instream environmental or conservation purposes.

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[196] *Indigenous Law* art 20(c).

[197] The National Indigenous Development Corporation can authorise the alienation of *derechos de aprovechamiento* if the value of the subsidy provided by the Fund is repaid. See *Indigenous Law* art 22(2).

[198] Macpherson, n. **Error! Bookmark not defined.** above, at 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), at p 8.

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 Chile's north.[200] These prohibit (without express permission) explorations and extractions of groundwater from aquifers that supply certain wetlands of particular significance to Indigenous communities in the north of Chile,[201] indirectly protecting the flow of these areas of importance to the Indigenous peoples. However, Yañez and Molina suggest that 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 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 on government funding and support, and depend the varied reasoning and approach of judges,[203] 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

[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* arts 58(5), 63(3) respectively.

[202] N. Yañez and R. Molina, *Las Aguas Indigenas en Chile [Indigenous Waters in Chile]*, (LOM Ediciones, 2011) Chapter 2, 106.

[203] See Bauer, *Siren Song: Chilean Water Law as a Model for International Reform*; Macpherson, *Indigenous Rights to Water in Law and Regulation: Lessons from Comparative Experiences*.

[204] For a discussion of the problem of a 'patchwork' of Indigenous water rights in the in the US context, see Womble P., Perrone D., Jasenchko S., Nelson R., Szeptycki L, Anderson R. & Gorelick S., 'Indigenous Communities, Groundwater Opportunities' (2018) 361(6401) *Science, at* p 453.

incidence of Indigenous communities being allocated a share of water for cultural or conservation interests alone.

From 2005 until 2014 Indigenous communities who did not use their water rights for productive purposes could also be charged the tax for 'non-use' referred to above if they could not show the necessary water capture infrastructure, further disincentivizing environmental or conservation water protection. In 2014 the Supreme Court held that, in certain circumstances, Indigenous communities can acquire water rights over in-stream flows and retain them without having to extract freshwater resources, nor 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 holding 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 section 22 of the *Indigenous Law*. However, the judgment does not engage with the broader context, or consider 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 for a regulatory exemption to the taxes for non-use for small agricultural and peasant communities and Indigenous peoples, although the proposed amendment was not approved and has since been archived, leaving ongoing uncertainly 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

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

[206] 'Reforma El Código de Aguas, Examinando el 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] (Boletin No 8315-01), available at: https://www.camara.cl/pley/pley_detalle.aspx?prmID=8712&prmBoletin=8315-01.

should be taken into account when planning and implementing environmental water 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] Chilean Indigenous scholar, Marín, has emphasised 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:[208]

> 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.

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] In 2014, the Government amended this project and presented a new consolidated water reform

[207] Douglas et al, n. **Error! Bookmark not defined.**, at p 362.

[208] Marín, 'Constitutional Challenges of the South: Indigenous Water Rights in Chile - Another Step in the "Civilizing Mission?', 91.

[209] Examples include Bulletins N° 652-07; 1779-07; 6124-09; 6208-09; 6268-07; 6141-09); N°6816-07.

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

project, which is still before Parliament.[211] Amongst other objectives, the reform proposal sought to strengthen the Government's oversight role with respect to water, and incentivise more equitable distribution of water rights. The Government presented the reform proposal with the message:[212]

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

The main reforms proposed by the Government included a changed status for new water rights, from perpetual to temporary (30 years, extendable) and the expiration of water rights for non-use (4-8 years depending if they are consumptive or non-consumptive). The reforms would also: allow the Government to limit the exercise of water rights in the public interest, reducing them temporarily or redistributing water rights; introduce a priority for the use of water for human consumption and sanitation; prohibit the constitution of new water rights in National Parks and Virgin Region Reserves; limit the grant of water rights in other protected areas; and strengthen certain regulatory powers of the General Water Directorate.

The Government continued to work on and make changes to the project,[213] but the proposal was significantly expanded after Michelle Bachelet and her centre-left coalition took office for the second time in 2014, via the legislative process.[214]

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[211] Presidencia de la República, Oficio No 459-362, 8 October 2014 (Chile) refering the Project of Law Boletín at pp 7543-12. See Bauer, 'Water conflicts and entrenched governance problems in Chile's market model', 159–67 for a summary of the post 2005 reforms up until 2015.

[212] Presidencia de la República, Oficio No 459-362, 8 October 2014 (Chile) refering the Project of Law Boletín at pp 7543-12.

[213] The Government amendments include: Presidencia de la República, Oficio N° 1097-362, 6 January 2015, refering the admendment of Water Code. Boletín N° 7.532-12; Presidencia de la República, Oficio Nº 613-363, 6 July 2015, Boletín N°7.543-12; and Presidencia de la República, Oficio N° 926-363, Boletín N°7.543-12.

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

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 a 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, and allowed the Directorate to establish minimum ecological flows on water rights already allocated in those areas that the Ministry of Environment considered to be threatened, degraded or prioritized ecosystems or within 'protected areas'.[217] In addition, the Lower House added a provision to affirm the Directorate's practice 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 exceptions to cases where right holders are Indigenous people or communities (recognizing recent jurisprudence from the Courts discussed

[215] Bauer, 'Water conflicts and entrenched governance problems in Chile's market model', 162.

[216] President of Senate, Proyecto de Reforma Al Código de Aguas [Water Code Amendment Bill] Oficio Nº 12.995 (22 Noviembre 2016), ('*Water Code Amendment Bill*') art 129 bis 1.

[217] This would not affect water rights allocated to small farmers according to article 13 of *Law N° 18.910*.

[218] *Water Code Amendment Bill* art 129 bis 1.

above);[219] water rights that are 'not used' by rightholders to maintain ecological function in protected areas declared by the Ministry of Environment; and water rights used for recreational, tourism or other projects that don't require water to be used or extracted from its source.

The reform proposal also included further substantive provisions protecting Indigenous rights to water. At clause 5 the proposal provided:[220]

> 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.

This proposed amendment attempted to reverse the separation of water and land rights in Chilean water law frameworks,[221] and adopt 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 a prioritization of water use for human consumption and sanitation,[224] in line with a shift back towards emphasising 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

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[219] Those referred to in article 5 (of the reform approved by the Lower House) and articles 2 and 9 of *Law N° 19.253*.

[220] *Water Code Amendment Bill* art 5 bis.

[221] Indigenous resistence to separation of land and water, in line with international and regional law and jurisprudence, has been emphasised since the development of the *Indigenous Law*. See Macpherson, n. **Error! Bookmark not defined.** above, at pp 161–210.

[222] *ILO Convention 169* arts 6, 7.

[223] *Water Code Amendment Bill* art 5.

[224] Ibid.

proposal included a number of further exceptions to general principles for Indigenous communities, aside from fees for non-use, including exemptions from the five year limit on regularisations of water use rights,[225] and exemptions from restrictions on exercising their 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 Water Directorate, the Parliamentary committees charged with developing the law reform proposal decided to leave the Indigenous protections out of early development 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 Indigenous peoples have to water, but for the Indigenous right to consultation underscored in Chile's commitment to *ILO Convention 169*,[228] as well as domestic legislation around 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 at 2020 it languishes before the Senate. The incumbent right-wing Piñera Government (returned for the second time in 2017) has, until recently, had little appetite for reforming water law away from a market-based logic. After taking office, President Piñera announced his opposition to the water reform project, arguing that it presents uncertainty and probable loss for the Chilean agricultural

[225] Ibid, trans art 2.

[226] Ibid, trans art 5.

[227] Macpherson, n. **Error! Bookmark not defined.** above, at p 209.

[228] *ILO Convention 169* arts 6, 7. For more analysis of the application of ILO 169 in Chile's regional context see Marín, 'Constitutional Challenges of the South: Indigenous Water Rights in Chile - Another Step in the "Civilizing Mission?', 99–105.

[229] *Indigenous Law* art 34.

sector.[230] His new Government would instead provide security to 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] In January 2019, the Government again amended the proposal,[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 re-modified by the Piñera Government, the proposal reinforced the status of water rights as perpetual, transferable and non-extinguishable. The proposal no longer referred to Indigenous peoples, dismissing the Lower House's modification to article 5

[230] Piñera S., *En Nuestro Gobierno Vamos a Asegurar La Disponibilidad de Agua [In Our Government We Are Going to Secure Water Availability]* (12 October 2018), available at: http://www.sebastianpinera.cl/sebastian-pinera-en-nuestro-gobierno-vamos-a-asegurar-la-disponibilidad-de-agua.

[231] See http://www.sebastianpinera.cl/images/programa-SP.pdf .

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

[233] Oficio N° 369-366, indications to the Proposal to Amend the Water Code, Boletín N° 7543-12. 10 January 2019.

[234] Baeza E, 'Aspectos relevantes de la Indicación Sustitutiva del Poder Ejecutivo al Proyecto de Ley que Reforma el Código de Aguas (Boletín N° 7.543-12) [Relevant Aspects of the Motion to Substitued of the Legislative Project that Reforms the Water Code (Bulletin N° 7543-12) (National Library of the Parliament, April 2019).

to ensure the integrity between land and territory for Indigenous communities, and removing the exemption of Indigenous was users from fees for non-use.

In terms of minimum ecological flows, the amended proposal stated, 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 went 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 the tariff'.[236] However, the Government's analysis appeared to miss 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 has been caused by 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 introduced to 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 to the environment.

If passed, the Piñera Government's minimal water reforms will at least grant a larger oversight role for the Directorate and provide more clarity around regarding fines for non-use. But the proposed reforms, as they stand, do not provide sufficient tools,

[235] Oficio N° 369-366, 10 de enero de 2019, que formula indicación sustitutiva al Proyecto de Ley que Reforma el Código de Aguas, Boletín N° 7543-12.

[236] Ibid.

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 sector, who argue they the reforms are misguided and infringe on the constitutional right to property. The Agricultural Committee of the Senate, during its discussions on the reforms heard various politicians, private sector and non-governmental organizations express their concerns, points of view, and observations on the evolving reform project.[237] The first presentation was from the Minister of Agriculture, Antonio Walker, who declared that the reform was his priority project, emphasizing the risk that 'a bad reform could slow down investment', and explaining how important water is for the agricultural sector.[238] His Ministry supported him with concerns that the reforms proposed by the Lower House would detrimentally affect pre-existing and protected water rights.[239] The National Society of Agriculture went even further and argued that the reform was unconstitutional, and that any attempt to apply environmental flows would retrospectively infringe constitutionally protected private property rights. Instead, the agricultural sector proposed 'technical improvements' and a review of administrative, management and technical processes within the Directorate.[240]

[237] Among the participants were: Antonio Walker (Ministry of Agriculture), Andrés Meneses (Legal Advisor of the Ministry of Agriculture), Felipe Hermosilla (Legal Advisor of the Ministry of Public Works), Fernando Peralta (President of the Associaton 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 Medidum Hydropower Station), Professor Alejandro Vergara Blanco, Rodrigo Mardones (Partner of the National Asscoiation of Milk Producers), Joaquín Villarino (Excecutive President of the Mining Council), Hernán Valenzuela (Adviser at Fundación Jaime Guzmán).

[238] Maria Paz Alfaro Julio, 'El Agua Como Bien Nacional de Uso Público, Análisis Comparativo entre la Legislación Histórica, Actual y la Reforma al Código De Aguas' [Water as National Property of Public Use, Comparative Analisis between the Historic Legislation, Current and the Refom to the Water Code] (Legal Sciences Bachelor Degree, Chile University, Chile, 2017) at p 101.

[239] Ibid

[240] Ibid.

The water reform proposal continued to 'stumble its way' through the legislative process and the last session of the Agricultural Committee was held on 18 November 2019, to discuss water scarcity.[241] However, in the meantime, the neoliberal model underpinning the Chilean water regime has provoked new social contestation and constitutional crisis in Chile, beginning as recently as 18 October 2019. As part of this social protest and constitutional crisis, the project to modify the *Constitution* and related debates around the regulatory regime for water have been revived, in an effort to demonstrate the commitment of politicians to address the people's demands.[242]

On the morning of 15 November 2019, the Government announced, after many hours of discussion with members of the Parliament, an *Agreement for Social Peace and a New Constitution.*[243] In this agreement, the Chilean Government has committed to hold a referendum on April 29th 2020 with the following two questions: 1. Do you want a new Constitution (Yes/No)? and 2. What type of authority/entity should write the new Constitution (*Convención Mixta Constitutional* or *Convención Constitutional*)?[244] There are still many uncertainties in terms of the detail of the referendum process, but there is growing public debate and social mobilization around constitutional reform and the fair distribution of rights. Certainly article 19(24), and specifically the right to property over water rights, will play a key role in the discussions, and may have implications for the future of environmental flows in Chile.

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[241] Ibid.

[242] See Bulletin N° 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#.

[243] Agreement for Social Peace and a New Constitution (15 November 2019), available at https://www.senado.cl/logran-historico-acuerdo-para-nueva-constitucion-participacion/senado/2019-11-14/134609.html.

[244] Whether it is constituted 100 per cent by members of the parliament or 50 percent members of the Parliament and 50 per cent of elected citizens.

5 TOWARDS HOLISTIC ENVIRONMENTAL FLOWS IN CHILE

There is now an international consensus around the need for environmental flow regimes to be implemented 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 ecological functions of environmental flows, and the need for environmental flow regimes to reflect and account for Indigenous water governance and rights. Advocates for 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.[245] Douglas et al provide a useful conceptual starting point for the design of a holistic environmental flow regime, which accounts for cultural as well as ecological interests.[246]

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 General Water Directorate, 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 Directorate's power to set minimum ecological flows only applies to the granting of new water rights, even though water had already been largely allocated to private users when the process begun. Meanwhile, the courts continue to regularize historical water uses, without

[245] See Douglas, Jackson, Canham, Laborde, Beesley, Kennard, Pusey, Loomes, and Setterfield, 'Conceptualizing Hydro-socio-ecological Relationships to Enable More Integrated and Inclusive Water Allocation Planning', 362.

[246] Douglas et al, n. **Error! Bookmark not defined.** above.

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, social or 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 Directorate, the Service, or private water user associations once they are established.

Nor is there provision made, in the setting or management of environmental flows, for the significant legal rights and values of Indigenous peoples. If anything, Chilean water law frameworks disincentivize non-extractive environmental or cultural water uses, by charging fees for non-use where water right-holders wish to leave water in-stream. Indigenous peoples' 'complex waterscapes' of social, cultural, spiritual, environmental and economic interests [247] are reflected in legislative protection of ancestral water rights (at least in the north of Chile, but arguably more broadly) and a Fund existing 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

[247] Babidge, 'Contested value and an ethics of resources: Water, mining and indigenous people in the Atacama Desert, Chile', 85.

qualities to support ecosystem health and takes into account Indigenous rights and interests. There are multiple legal reasons why the government should do so. The Chilean institutions have in the past been prepared to rely on implied regulatory powers, and the Chilean courts have supported them in doing so, emphasising the important role public authorities have to play in protecting the environmental qualities of waterways. Our review of Chilean legal decisions has demonstrated that 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 characterisation of waters as 'national goods for public use'. In this context, the public interest does not only encompass water use for industrial or commercial purposes and human consumption, but also to ensure healthy ecosystems and their preservation for future generations.[248] It is also consistent with the obligations public authorities have 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 Directorate to consider the rights of 'third parties',[249] when granting new water rights, which could include harm or impact to ecosystems, implying a duty for the water authority to take into account, when making their decision, the need for in-stream flows.[250] Most significantly, the duty to protect the environmental qualities of rivers, and develop an effective environmental flow regime, is also a constitutional mandate. The Constitution in article 19(8) protects the right to a

[248] Tatiana Celume, *El Régimen Público de las Aguas* [Public Regime of Waters] (Legal Publishing, Santiago, 2013) at p 136.

[249] *Water Code* art 22.

[250] Riestra, n. 128 above, at pp 103, 108.

clean and healthy environment, and explicitly states that 'the law many establish specific restrictions on certain rights or freedoms in order to protect the environment'. Environmental water governance should not be left to private water user associations, when it is a constitutional imperative and matter of public interest.

There are also clear legal reasons why the Chilean institutions should plan for and include Indigenous peoples to 'build legitimacy'[251] in the implementation and management of environmental flows. Chile has ratified *ILO Convention 169,* with its protections of Indigenous territorial rights to natural resources. In the Chilean constitutional system, international human rights treaties are, at least in theory, 'self-executing',[252] 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.[253]

In terms of the grant of new water rights, there is nothing preventing either the General Water Directorate or the Environmental Impact Assessment Service from revising their approach to setting environmental flow requirements in a more holistic manner, to take into account ecosystem health and current and prospective Indigenous water uses and values. The Service, in particular, is not legally bound by the current limits imposed by the Directorate for minimum ecological flows,[254] and could in fact enhance the protection of freshwater ecosystems by taking into account other elements

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[251] Douglas, Jackson, Canham, Laborde, Beesley, Kennard, Pusey, Loomes, and Setterfield, 'Conceptualizing Hydro-socio-ecological Relationships to Enable More Integrated and Inclusive Water Allocation Planning', 98.

[252] *Constitution* art 5(2).

[253] Recabarren O., '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*, at pp 305, 307.

[254] Which (discussed below) is typically 20 per cent of the average annual flow rate in the corresponding watercourse.

that might not be considered as part of the Directorate's methodology. As the Supreme Court has emphasised, the 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 preventing the institutions from working together with Indigenous peoples in the setting and management of environmental flows, and 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 desire to leave those water rights in-stream for conservation, spiritual or cultural purposes it would be relatively straight-forward to allow them to do so, and to plan for this use within environmental flow regimes. Those users who leave river flows in-stream for environmental or cultural purposes should be exempt from paying fines for 'non-use', and, to promote certainly, 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.[255] Water regulation is generally contentious in Chile, because of the quantity and range of interests in Chile's rivers, including those of productive users.[256] In catchments where water rights are already fully or over allocated, some form of water recovery would be needed, and the prospect of buying-back rights is expensive. Gomez et al estimated in

[255] 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. **Error! Bookmark not defined.** above, at 32. O'Donnell E., Horne A. C., Godden L. & Head B., 'Cry Me a River: Building Trust and Maintaining Legitimacy in Environmental Flows' (2019) 23(1) *Australasian Journal of Water Resources*.

[256] Bauer C., 'Dams and markets: rivers and electrical power in Chile' (2009) 49 *Natural Resources Journal, at* 583, 598; O'Donnell & Macpherson, n. **Error! Bookmark not defined.** above, at pp 24-25.

2014 that the cost of buying-back water for environmental flows and pollution-dilution in the Maipo river would be $1.9M US dollars.[257] However, they argued that this is more efficient way to manage pollution than other pollution-reduction alternatives, and point to a need for further consideration by Chilean policymakers of the social benefits of environmental water.[258]

Any sort of compulsory redistribution of water to the environment would impact already allocated water rights, meaning 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 imply 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.[259] Given Chile's difficult history of water reform and entrenched water interests, it is a fair assessment that such a drastic reform is unrealistic, although more thinking needs to be done as to 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

[257] J. Gomez, O. Melo, and C. De La Maza, 'Restoring environmental flow: Buy-back costs and pollutiondilution as a compliance with water quality standards', *Water Policy*, 16 (2014).

[258] Gomez, Melo, and De La Maza, 'Restoring environmental flow: Buy-back costs and pollutiondilution as a compliance with water quality standards', 877.

[259] For example, in January 2020, the Senate rejected a constitutional reform proposal begun in 2008 seeking to modify the water regime with a vote of 24 in favour of reform and 1, which failed to achieve the necessary two-thirds majority. See the parliamentary debates at Boletín 6124-09 https://www.senado.cl/appsenado/templates/tramitacion/index.php?boletin_ini=6124-09

intensifies and climate change advances.[260] This will continue to have major implications for humans as well as the natural world, in terms of water security, health, prosperity and well-being and is likely to provoke more common and more intense water conflicts.[261] 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.[262] 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 paper 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 attempted to make a case for a more holistic environmental flows regime in Chile, and for the government institutions to plan prospectively for and administer a comprehensive environmental flow regime, although more research is needed and we invite others to build on our argument. We recognise that, in the context of finite water resources, safeguarding environmental flows and including a flow of water for Indigenous use may be costly and politically unpalatable, potentially requiring the redirection of water away from consumptive, economic purposes. However, until these 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.

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[260] Valdés-Pineda, Pizarro, García-Chevesich, Valdés, Olivares, Vera, Balocchi, Pérez, Vallejos, Fuentes, Abarza, and Helwig, 'Water governance in Chile: Availability, management and climate change', 2563.

[261] Arthington, *Environmental flows: saving rivers in the third millennium*, 14–15.

[262] Marín, 'Constitutional Challenges of the South: Indigenous Water Rights in Chile - Another Step in the "Civilizing Mission?'; Nahuelhual, Saavedra, Henríquez, Benra, Vergara, Perugache, and Hasen, 'Opportunities and limits to ecosystem services governance in developing countries and indigenous territories: The case of water supply in Southern Chile', 16.

In 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:[263]

> 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.

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 the Chilean institutions fail to effectively plan 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

[263] Ibid.

and regulation, including adequate provision for the environment and Indigenous peoples.