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## Water Conflicts and Entrenched Governance Problems in Chile's Market Model

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**ABSTRACT:** The Chilean system of tradable water rights and water markets has been well known and controversial in international water policy circles since the 1990s. Chile's 1981 Water Code is a textbook example of neo-liberalism, with strong private property rights and weak government regulation, and the market in water rights has been the dominant theme in debates about Chilean water policy, both nationally and internationally. The Water Code was somewhat reformed in 2005 after over 13 years of political debate. In this paper I review the issues in water policy and politics in Chile during the decade since that reform. What does the ongoing Chilean experience tell us about water privatisation, markets, and commoditisation? Water conflicts have become the essential issue in Chile, rather than water markets. In the past decade conflicts among multiple water users have deepened and widened in many parts of the country, involving river basins and groundwater aquifers. The institutional framework for governing these water conflicts has worked poorly, for a variety of reasons, and the conflicts have become a serious national political problem. I review the evolving political and policy debates in Chile, including the current government's proposal in 2014 for a new and stronger reform of the Water Code. In short, the critical problem of the Chilean water model is the lack of institutional capacity for governance or integrated water resources management, and the problem has worsened as water conflicts have become closely linked to conflicts in the energy and environmental sectors.

**KEYWORDS:** Water conflicts, water governance, water politics, water markets, Chile

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### INTRODUCTION

Water conflicts in Chile have grown deeper and wider in the last ten years. These conflicts have many facets: legal, political, economic, social, and environmental. Chile's institutional framework for governing water conflicts has been fragmented and ineffective, notwithstanding a reform of the Water Code in 2005. Political deadlock over water rights reform has been compounded by ad hoc and separate legal reforms in the energy and environmental sectors. Conflicts over property rights and regulatory governance in water, energy, and environment have become a chronic and highly visible problem in Chilean political economy. Moreover, Chile's predominant response has been to create a series of specialised courts, which makes regulatory governance more fragmented at a time when natural resource and environmental problems demand a more integrated response.

The 'Chilean model' of water rights and water markets was defined by Chile's 1981 Water Code and 1980 Constitution. Both documents were written and approved during the period when the Chilean military government built the legal and institutional foundations for the country's future. It was a period charged with strongly ideological viewpoints, when the military junta and their civilian advisers sought to lock in and institutionalise the dramatic social, economic, and political changes that the government had imposed (Bauer, 1998a).

In the 1990s, the Chilean water model became world famous in water policy circles because of its neoliberal approach: water rights were privatised and separated from landownership, government

regulation of water use was weak and restricted, and free markets in tradable water rights were expected to increase national economic efficiency and growth (Bauer, 1998a). Since that time much international debate about water policy has revolved around the goal of 'integrated water resources management' (IWRM). One fundamental principle of IWRM is that 'water is an economic good', but what that principle means in practice has been hotly disputed. Is water a tradable commodity, a scarce resource, or a human right? The Chilean case has been internationally significant because of its neoliberal emphasis: water rights are commodities to be privately traded. At the international level the World Bank has been the most forceful proponent of the Chilean model, although by the late 1990s the Bank was moderating some of its more extravagant praise.

In 2004, I published an assessment of the Chilean water rights model, on the eve of the first significant reform of the 1981 Water Code. I concluded that the model had had both positive and negative effects.

The Chilean model has had two main economic benefits: first, the legal security of private property rights has encouraged private investment in water use, for both agricultural and non-agricultural uses; and second, the freedom to buy and sell water rights has led to the reallocation of water resources to higher-value uses in certain areas and under certain circumstances (Bauer, 2004: 132).

Both of these economic features are fully compatible with Chile's overall national economic system, which is driven by exporting natural resources to international markets. The Water Code's more negative effects are the problems of coordinating different water uses and resolving conflicts.

[T]hose [economic] benefits are directly linked to a legal, regulatory, and constitutional framework that has proven not only rigid and resistant to change but also incapable of handling the complex problems of river basin management, water conflicts, and environmental protection. These more complex problems, of course, are precisely the fundamental challenges of integrated water resources management (Bauer, 2004: 132).

The empirical evidence for these conclusions came especially from case studies of two important river basins in south-central Chile, Maule and Bío Bío.

My specific institutional critique was that the legal framework was too weak to resolve or reduce conflicts among different kinds of water uses. In the Chilean context, private organisations of agricultural water users are supposed to play a major role in water governance: canal associations run individual canal systems, and vigilance committees (*juntas de vigilancia*) are federations of different canal associations along a given stretch of river. Both kinds of organisations are made up almost entirely of irrigators and are dedicated to agriculture. Both organisations lack authority or leverage over water users outside of agriculture, e.g. hydropower, urban water supply, mining, or industry. The government agency for water rights and administration is the *Dirección General de Aguas* (DGA), or General Water Directorate, which is part of the Ministry of Public Works, but the DGA has no regulatory authority over conflicting water uses. Under the 1981 Water Code the DGA's primary functions have been to grant water rights to private applicants and to maintain legal and hydrological records. As a result, the more complex and difficult water conflicts have ended up in the ordinary civil courts. Because Chilean judges lack expertise in water law or policy, their decisions have typically been erratic, superficial, or incomplete. The result has been a vacuum in public decision-making, which has benefitted the actors with more power and resources to pursue their own interests (Bauer, 1998a, 1998b, 2004).

By 2004 Chile was in the 13th year of a prolonged political debate about reforming the Water Code. The terms of debate had narrowed dramatically from the government's original proposals in 1992, which had aimed to change core elements of the model. (For more political background and context, see the third section.) Neither the government proposals nor the bulk of academic and policy research paid much attention to how to govern water conflicts. At the time I argued that the Chilean model's

institutional capacity for water governance was its critical weakness, and therefore water conflicts would likely get worse in the future. This was a structural argument: the Chilean water model's weak capacity for governance and IWRM was built into the institutional framework, which had been built primarily to protect private property rights and to allow free market transactions without government interference.

In any case, water conflicts in Chile were still known mainly to water experts and water users. The general public and the political class were unaware of these issues, except for occasional TV and newspaper headlines. That was the situation when the Water Code was finally reformed in 2005, reflecting the narrow terms of debate mentioned above.

In the decade since then, however, water conflicts in Chile have worsened. They have become more widely spread throughout the country, more entrenched and entangled, more complex and multi-sectoral, and more closely tied to energy and environmental conflicts. Water conflicts are now far more visible in national politics. Another round of Water Code reform is high on the list of the current government's priorities, although the coherence and plausibility of the government's position are not clear. Water conflicts today appear to be intractable in ways that are inherent to the current institutional model. What will the next decade look like?

The rest of the paper is organised as follows. In the next section I briefly summarise the comparative and international context of water policy and governance. This is not a comparative paper: the analysis focuses on the Chilean case in its own particular historical context. The case is of wider international interest because of its emblematic neo-liberal approach, and the deeper problems emerging from the nexus between water, energy, and environment as the Chilean model evolves. I refer briefly to other leading examples of water rights markets and reforms. In the following section I discuss the 2005 reform of the Water Code, including its historical and political background. After that I present a simple typology of contemporary water conflicts in Chile, which I illustrate with examples of each category. The evidence here is in a sense anecdotal, as I do not have an extensive database, but it reflects my ongoing research visits and assessment of the water model. The section after that traces the evolution of both water politics and water policy research since 2005. Their evolution supports my argument that water conflicts are worsening while institutional capacity to govern them remains weak. This section shows how different the political context of water conflicts has become over the last ten years, and concludes by looking at the current Bachelet government's proposed reforms in 2014. The final section summarises and points to broader lessons of the Chilean experience.

My analysis in this paper draws on articles in the Chilean news media, both print and online; interviews, both published and unpublished, with experts, government authorities, and stakeholders; government and policy documents; and academic publications.

## **WATER MARKETS, CONFLICTS, AND GOVERNANCE IN INTERNATIONAL CONTEXT**

'Water governance' became a popular term around the year 2000 as part of international debates about 'sustainable development', 'integrated water resources management', and 'global water crisis'. All of these terms have tended to become vague generalities through careless overuse. I consider 'governance' to be the generic process of governing, while 'government' refers to specific formal institutions that govern. Governance is thus a broader category than government and includes a variety of social and political actors in addition to the state. Governance is inherently political (Conca, 2006; Bakker, 2010; Lautze et al., 2011).

In this paper water governance means the legal and political processes and institutions for *resolving conflicts* over water, especially conflicts among multiple water rights, uses, and values. Resolving conflicts includes making decisions and trade-offs among different alternatives. Some conflicts, of course, cannot be resolved, but at best managed over time.

The Global Water Partnership (GWP) declared in 2000 that "The water crisis is mainly a crisis of governance", and by *governance* the GWP basically meant conflict resolution:

The present threat to water security lies in the failure of societies to respond to the challenge of reconciling the various needs for and uses of water (...) And *governance* lies at the center of the tension and delicate balance between different water uses and their management (Global Water Partnership, 2000: 23, emphasis in original).

Three years later the GWP published a background paper about water governance, emphasizing that "[g]overnance is about effectively implementing socially acceptable allocation and regulation and is thus intensely political" (Rogers and Hall, 2003: 4).

The World Bank offers another angle on water governance. In 1993 the Bank's *Policy Paper on Water Resource Management* cast a wide net with a general emphasis on markets, privatisation, and pricing, coupled with arguments in favour of strong government regulation and "strengthened institutional arrangements". The paper spoke in generalities about IWRM and a "comprehensive analytical framework that takes into account the interdependencies among sectors and protects aquatic ecosystems", but the concrete meaning was vague and the political tone was muted (World Bank, 1993: 40-41). The paper's appendices included critical analyses of market failures and of past World Bank investments in water resources.<sup>1</sup>

A decade later, in contrast, the Bank's key water experts reasserted their authority and perspective after years of defending the Bank from outside criticism. A good example was the work and final report of the World Commission on Dams, from which the World Bank distanced itself as much as possible (see World Commission on Dams, 2000; Dubash et al., 2001; Conca, 2006). The Bank's 2004 *Water Resources Sector Strategy* included the ideas of the GWP, such as the Dublin Principles and the 'comb' of IWRM (World Bank, 2004).<sup>2</sup> But the 2004 *Strategy's* emphasis was on the *implementation* of the Bank's ideas and policies, which meant a more down-to-earth approach to how reforms work in the real world.

The main management challenge is not a vision of integrated water resources management but a 'pragmatic but principled' approach that respects principles of efficiency, equity and sustainability while recognizing that water resources management is *intensely political* and that reform requires the articulation of prioritized, sequenced, practical and patient interventions. To be a more effective partner, the Bank must be prepared to back reformers and to pay more explicit attention in design and implementation to the political economy of reform (World Bank, 2004: 3, emphasis added).

By political economy the Bank means placing "particular emphasis on the distribution of benefits and costs and on the incentives that encourage or constrain more productive and sustainable resource use". This more bare-knuckled approach meant that "the World Bank will re-engage with high reward/high risk hydraulic infrastructure" – that is, dams (World Bank, 2004: 13, 3).

In this global context several countries have pioneered the use of water markets to improve water use and management, which involves new definitions of property rights in relation to government regulation. The leading examples are Chile, California and the Western US, Australia, and Spain, all with arid or semiarid regions where water is usually scarce. In all of these cases markets are one of several institutional mechanisms for allocating water among competing uses; they exist in specific historical

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<sup>1</sup> See Moore and Sklar (1998) for a critical analysis from an NGO perspective.

<sup>2</sup> For the GWP comb, see World Bank (2004: 12-13). The Bank re-named the 4th Dublin Principle the 'instrument principle', presumably to avoid the polemical term 'economic' (World Bank, 2004: 1).

contexts with specific political and economic backgrounds. Water governance in all of these countries is highly conflictive, reflecting the critical nature and high stakes of the issues.<sup>3</sup>

In short, I do not argue in this paper that Chile is 'more conflictive' than other countries with different water rights systems. Instead I focus on the Chilean case in its own historical context. Water governance takes a distinctive form in Chile because the institutional framework is so neo-liberal: state regulatory agencies are highly constrained and more conflicts end up in courts or in private negotiation. Social movements against this model have emerged and persisted in reaction to the lack of arenas for public decision making. The entrenched and widespread nature of water conflicts in Chile is remarkable, whether or not it is directly comparable to other countries.

## **WATER CODE REFORM IN 2005**

### **Recent political history**

A brief summary of recent Chilean political history would start in the 1960s with the centre-left reformist government of President Eduardo Frei M. and the Christian Democratic party. The Frei government was a leading Latin American example of the Alliance for Progress promoted by US President John F. Kennedy, and its emblematic policy was the comprehensive Agrarian Reform Law of 1967. In 1970-1973 Chile was governed by the socialist President Salvador Allende and his Popular Unity coalition of left-wing parties, who attempted to implement radical policies of nationalisation and government control of the economy until the Chilean armed forces took power in a coup on 11 Sept. 1973.

The military government, led by General Augusto Pinochet, remained in power until 1990 and during that period radically transformed Chilean society, politics, and economy, in the opposite direction from the Allende government. The military government's vision combined neo-liberal economics with authoritarian politics, and both were institutionalised in the new Constitution of 1980. In 1988 a broad democratic political opposition won a national plebiscite against the military government, playing by that government's own rules, and in 1989 the opposition was elected to govern the country, led by President Patricio Aylwin. The coalition of parties from centre-left to centre-right was called the *Concertación*, which was re-elected three times and governed the country continuously for 20 years from 1990 to 2010.

The military agreed to transfer power to their democratic opponents only after those opponents had firmly committed to follow the legal rules in the 1980 Constitution and to maintain free-market economic policies. The basic programme of the *Concertación*, with some variations under four successive Presidents, was to consolidate political democracy while promoting market-driven economic growth. Within that context the *Concertación* proposed and attempted a wide range of centre-left social reforms, which had to be negotiated with right-wing political parties who were now in the opposition. Under the 1980 Constitution, that opposition had powerful tools to block or veto government proposals.

### **Water rights**

In the area of water rights, during the past half-century the legal pendulum has swung twice, first to one extreme and then to the other. The pendulum began somewhere in the middle in the 1950s, with a 1951 Water Code that combined private water rights with strong government regulation, in a way that resembled the Western United States in the early 20th century. The pendulum swung to a system of

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<sup>3</sup> On California, see Hanak et al. (2011); on Spain, Saurí and del Moral (2001) and Aguilera and Sanchez-García (2005); on Australia, Crase (2008) and Garrick et al. (2012).

government-controlled water resources in 1967, as part of Chile's Agrarian Reform Law that expropriated and redistributed land rights. After the military coup in 1973, the pendulum swung to the neo-liberal antithesis of the 1967 Water Code: a free market in water rights with very little government regulation. The 1981 Water Code was approved by Chile's military government during the foundational period of its neo-liberal policy-making (see Bauer, 1998a, 2004).

The 1981 Water Code remains in place today, somewhat modified by a legal reform that was approved in 2005 after nearly 15 years of political debate and stalemate.<sup>4</sup> Over that period, the scope of the *Concertación* governments' proposed reforms narrowed steadily in response to strong political opposition from conservative political parties and private sector business interests. At the same time, the government's position on the benefits of water markets gradually became more favourable. The 2005 Water Code reform represented a hard-won, if limited, consensus across the spectrum of political parties in Congress.

The 1997 decision of the Chilean Constitutional Tribunal is an example of support for the government's position favouring reform. The government had proposed establishing a new fee for any water rights owner who was not in fact using his/her water rights for a productive purpose. These 'fees for non-use' (*patentes por el no uso*) would be paid to the government annually by any water rights owner who had not yet put his/her new rights to concrete use. A group of right-wing Deputies asked the Constitutional Tribunal to declare that the government's proposed changes were unconstitutional limitations on private property rights, and also to declare that the DGA could not place any additional conditions on new water rights that might be granted in the future.

The Tribunal ruled in favour of the government, affirming the legal status of water resources as public property and clarifying that private rights that have not yet been granted did not enjoy constitutional protection from new regulations. Although this was undoubtedly a victory for the government, the scope of the Tribunal's decision was narrow. It allowed ordinary legislation to impose limitations on future rights, but did not clarify what limitations – including fees for non-use – could be applied to existing water rights (Bauer, 2004: 66-67).

The 2005 reform included new provisions to improve water rights title information and record-keeping; to strengthen management of groundwater; to strengthen the DGA's regulatory authority over future grants of water rights, but not over existing rights; and to begin to address the long-ignored problem of ecological flows. These new provisions were worthwhile but nonetheless incremental improvements in water law and administration. No constitutional issues were affected and most of the Water Code's core principles remained intact. The reform aimed to improve the water market's functioning rather than trying to regulate it much.

The most important and controversial change was the establishment of fees for non-use. The goal of these fees was to prevent private speculation, hoarding, and monopoly power over water rights – all problems for which the 1981 Water Code was criticised – and to encourage water's productive use. The fees were designed to apply primarily to non-consumptive water rights, reflecting the high priority placed on hydropower development, and to effectively exempt most consumptive water rights, which are used for irrigation, urban supplies, and mining. Implementing the fees for non-use was expected to activate water markets by inducing owners to give up their unused water rights, which the DGA would then auction to new owners.

Humberto Peña and Pablo Jaeger, who were the two persons most responsible for pushing the reform through a reluctant National Congress, have made the strongest arguments in its favour. Peña

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<sup>4</sup> The 2005 reform is Law No. 20,017. See Budds (2013) and Bauer (2004) for more detailed description of the political debate from 1992 to 2004, and Bauer (2013: 137-138) on the 2005 reform.

was head of the DGA for 12 years (1994-2006) and Jaeger was the DGA's chief lawyer for eight of those years (1995-2003).

In Peña's view,

there is widespread national consensus regarding the benefits of using the market to reallocate existing water rights and the need to maintain the guiding principle of current water legislation, namely the establishment of property rights over water use rights to provide legal certainty to water-related investments and to enable the market to reallocate water resources (Peña, 2005: 2).

Thus the government's reform expressly did *not* aim to "alter the essential characteristics of water use rights as established by the Code", and for that reason the government did not seek a constitutional amendment. "The purpose of the reform was to strike a balance (in the light of 21st century problems) between issues that were delicate for Chilean society and on which opinions were varied" (Peña, 2005: 2). Peña regretted that the government's moderate purpose had met such strong ideological opposition from the right.

After reviewing the reform's main features as summarised above, Peña (2005: 3) concluded that

with a State vision, a sound and stable balance has been achieved between the public interest and the rights of private individuals; between social and productive demands; and between both types of demands and environmental considerations. This balance is an accurate reflection of the development of Chilean society.<sup>5</sup>

Jaeger (2006) mounted a similar defence of the 2005 reform. He described the long years of political debates – sometimes as fierce within the government as in the Congress – that finally came to consensus about the need to fix key flaws in the Water Code: particularly the rules for original allocation of water rights. He argued that "the most important modification" was the shift "from desire to necessity" in applications for new water rights, so that an applicant had to show 'I need' rather than 'I want' (Jaeger, 2006: 1, 4-5). This reflected the government's overall view that public interests had to be strengthened in relation to private rights. Jaeger explained the fees for non-use as a specific policy instrument to control private speculation in water rights for hydropower, which was considered a problem because it delayed hydropower development. He also highlighted the DGA's increased authority in groundwater management and environmental flows. The new restrictions, however, did not apply to existing water rights, which are the vast majority.

In the different political climate of 2013, under the conservative government of President Sebastián Piñera (2010-2014), Jaeger and Peña looked back on the 2005 reform:

Notwithstanding the important modifications summarized, we must be very clear in recognizing that they were the fruits of negotiations undertaken in an adverse context for the people who promoted them, in light of the subsidy that the constitutional and legal system guaranteed to conservative political forces. In addition, the changes were centered on the principal problem at the time, which was to guarantee the protection of the public interest in the original granting of water rights...

*The changes of 2005 did not deal with the deficits that are evident and important today, such as the protection of the public interest after water rights have been granted; the aspects related to the functioning of the 'water market'; the sustainability of management of the resource in the medium and long terms in a changing hydrological context; and the issues of integrated water management in river basins (Jaeger and Peña, 2013: 7, emphasis added).*

In short, in the bigger picture and from a comparative and international perspective, the 2005 Water Code reform was modest. It strengthened some DGA authority and tinkered with the existing legal rules

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<sup>5</sup> See also Peña (2009) for a positive evaluation of the Chilean water model.

and institutional framework, but it barely touched the core principles of private property rights, market forces, and a weak state. River basin governance and coordination of multiple water uses remained untouched. The reform did very little to improve the capacity for integrated water management.<sup>6</sup>

### **WATER CONFLICTS SINCE 2005 REFORM OF WATER CODE**

Chile has an unusual and distinctive physical geography. The country is long and narrow, about 4000 km long and 200 km wide, and runs north-south along the Pacific coast of South America (see Figure 1). The climate varies gradually but dramatically from extremely arid deserts in northern Chile to the temperate rainforests, fiords, and glaciers of the far south, with the semiarid Mediterranean heartland of central Chile in between. The Andes Mountains are Chile's eastern border with Argentina and they run north-south along the entire length of the country. As a result, Chilean rivers begin in the Andes and flow downhill and west to the Pacific Ocean: they are short and steep and the different river basins have a similar form. The country consists of a series of medium-sized basins, with precipitation and river-flows that increase steadily from north to south.

Notwithstanding the 2005 reform, water conflicts in Chile have persisted and multiplied in the last decade. In this section I describe a simple typology of Chile's most severe water conflicts, illustrated with specific examples. I do not have a comprehensive database of water conflicts, which to the best of my knowledge does not exist in Chile. There are several academic, governmental, and non-governmental organisations that have been gathering information about water conflicts, for their different purposes, as discussed below. The NGOs, for example, may have an interest in emphasising conflicts as part of a critique of the current model. Government agencies may emphasise or ignore conflicts depending on the agencies' missions and political agendas.

My argument here is based on my knowledge of a number of important cases in different parts of Chile. In this classification scheme there are four basic types of water conflicts in Chile. Three of these types involve conflicts among different multiple water uses and values, with competing water demands by people in irrigated agriculture, cities, hydropower, mining, industry, environmental protection, and others.

- Type (1) is the case of river basin conflicts, particularly in central and southern Chile, involving multiple users of surface water, with hydropower often being the driving factor.
- Type (2) is the case of overexploited groundwater systems, particularly in the north, driven by large-scale mining, agriculture, and urban growth.
- Type (3) conflicts are about social and environmental issues broader than water use, but in which water issues are nonetheless central. These conflicts typically involve large mining projects in northern and central Chile, or large hydroelectric projects like HidroAysén.
- Type (4) conflicts have been different in kind: not so much about conflicting water uses but more directly political, driven by clashing views about the water law itself and its fundamental rules, principles, and ideology.

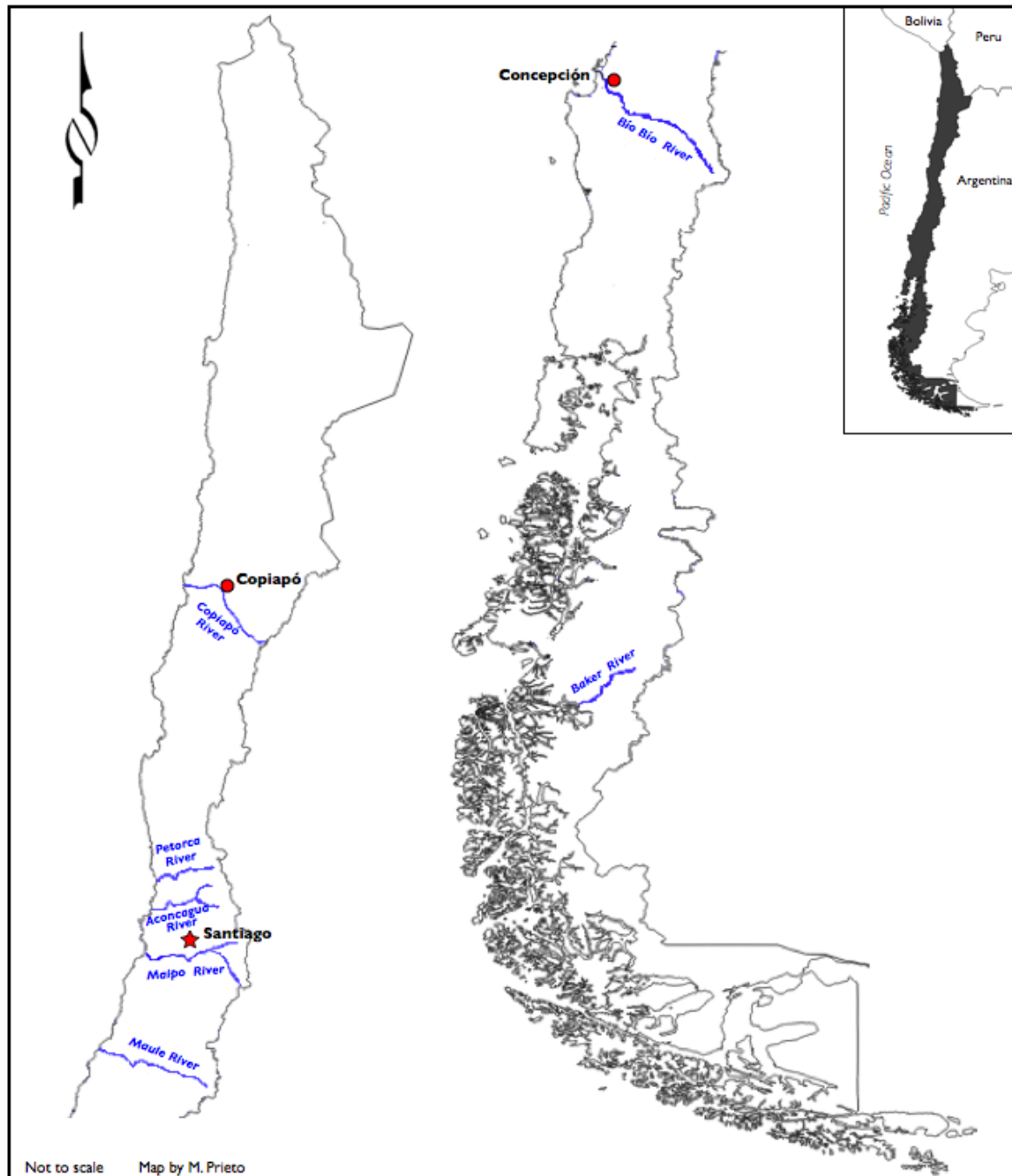
A specific conflict may fall into more than one type. In the rest of this section I briefly describe examples of water conflicts of types (1), (2), and (3). The common feature is that all of these conflicts have got more entangled, intractable, and multi-sectoral – that is, wider and deeper – in ways that are inherent to the Chilean water model. I discuss type (4) conflicts in a later section.

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<sup>6</sup> For empirical analysis of the fees for non-use during their first few years of implementation, see Valenzuela (2009) and Valenzuela et al. (2013).



Figure 1. Chile and case studies mentioned.



**Type (1): Multiple uses of surface water at the river-basin scale**

The Maule River Basin in south-central Chile has been the emblematic case of water use conflict between irrigation and hydropower since the early 1990s. At that time the institutional framework showed itself to be incapable of coordinating different water uses in a balanced way. Conceptually the problem is simple: irrigators and power companies want to store and regulate river-flows in different seasons of the year. In legal terms the conflict is between consumptive and non-consumptive water rights, which are two different categories: irrigators divert and consume the water to which they have

rights, while power companies pass the water through their turbines and must then return it to the stream (Bauer, 1998a, 1998b).

The DGA granted non-consumptive water rights in the Maule River to ENDESA in the 1980s. ENDESA was the national power utility, which was then state-owned (Bauer, 2009). ENDESA built two adjoining dams and reservoirs, called Colbún and Machicura, in an area that already had a well-developed canal system that irrigated well over 100,000 hectares of land. The water rights for Colbún (the larger reservoir) specified a monthly calendar of water delivery to local canal associations, according to their pre-existing consumptive water rights. ENDESA was privatised in the late 1980s, but Colbún remained in state ownership to be privatised separately a decade later.

In 1990 another private electric company, Pehuenche (a subsidiary of ENDESA), completed building a hydropower dam and small reservoir upstream of Colbún. Pehuenche Dam's operation required regulating river-flows in ways that harmed irrigators' water supplies downstream. The Maule River Vigilance Committee protested to the DGA and filed law-suits in Chile's higher courts. The question was simple: what rules governed the relationship between consumptive and non-consumptive water rights? The most obvious interpretation of the Water Code was that the use of non-consumptive rights must conform to the needs of consumptive rights, especially if the consumptive rights were prior in time. The DGA declined to intervene because it lacked the regulatory authority to do so, although it initially agreed with the irrigators. The regional appellate court in Concepción also ruled in favour of the irrigators. The Supreme Court, however, reversed that interpretation in 1993 in a related case in the Bío Bío River Basin, declaring that the owners of non-consumptive rights owed no obligations to other water rights, and could manage the river-flow as needed for hydropower (Bauer, 1998a, 1998b, 2004). That Supreme Court decision was a setback to integrated water management from which Chile has not yet recovered.

The Bío Bío River Basin offered the same lesson by the late 1990s. The Bío Bío is about 200 km south of the Maule and is probably Chile's largest and most important river, with a large variety of water uses: irrigated agriculture, hydropower, heavy industry, large urban demands (Concepción, Chile's 2nd-largest city, is located at the mouth of the river), and environment.<sup>7</sup> One of the Bío Bío's tributaries, the Laja River, has rivalled the Maule in its critical role supplying the national electric grid with hydropower, and its long-standing conflict between hydropower and irrigation. In the upper Bío Bío River, ENDESA built two large hydropower dams in the 1990s (Pangue and Ralco) in spite of bitter national and international opposition from environmental and indigenous groups. The Bío Bío River Basin has decades of history of conflicts among its diverse water users, over water quality as well as quantity, but regulation and governance have been fragmented and ad hoc (Bauer, 1998a).

In short, the Maule and Bío Bío River Basins have shown the flaws of the institutional framework: the vigilance committees may be good at managing and distributing irrigation waters but they have no effective authority over non-agricultural water uses; the DGA has no authority to settle disputes among water users; and the courts have the power but not the expertise to decide problems of property rights, public interests, and basin-wide water management.

The 2005 Water Code reform did not address these problems of consumptive vs. non-consumptive rights or basin-wide governance. The Maule River conflict continues to flare up every few years as local irrigators block the highways to protest the power companies' control of the reservoirs. At the national level this local conflict may seem a small price to pay for optimised electricity production. And indeed, at the national level we now understand that Chile's electricity law predominates over water law where hydropower is involved (Bauer, 2009). Hydropower is doubly privileged in relation to other water uses:

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<sup>7</sup> The Baker River in the far south has more volume but has not yet been developed and the local population is small.

its form of water rights owes few obligations to other water rights and uses, and the dams are operated mainly according to the rules of the national power grid.

Hydropower development has expanded widely in central and southern Chile in the last ten years, through building single-purpose dams both large and small, nearly always run-of-the-river (*de pasada*). National electricity prices have been high throughout this period, due to a series of problems in the energy sector, providing strong incentives to build more dams. All of this may be good news for hydropower generation, but not for other water uses.

In the last few years the Maipo River in central Chile has become another key example of growing conflicts among multiple water users. The Maipo River Basin includes the capital city of Santiago, with a population over 6 million, a large proportion of the country's industrial activity, some of its most valuable agricultural production, and important tourism and environmental interests in the upper basin. Currently a major hydropower plant has been planned in the upper basin, in a deal to share a reservoir that is controlled by Santiago's water utility. The conflict demonstrates the limitations of the current framework for water governance.

### **Type (2): Groundwater overuse at the basin scale**

The Copiapó River Basin became Chile's best-known example of excessive groundwater use in the late 2000s. The city of Copiapó is located in a river valley in the northern Chilean desert, over 600 km north of Santiago. It has been an important area for mining copper and other metals for many centuries, since the times of the Incas and the Spaniards, and large-scale industrial mining began in the late 19th century. (Chile's first railroad was built then to carry ore from Copiapó to the coast.) Local agriculture was historically limited by the arid climate, small population, and long distance to larger markets.

In the 1980s, however, the military government's economic policies triggered the Chilean fruit boom, and cultivation of high-value crops for export expanded in the Copiapó River Basin and other parts of the country (Jarvis, 1994). In Copiapó the expansion of fruit production (especially table grapes) was accompanied by a new mining boom in the 1990s and 2000s, driven by high world copper prices. The urban population of Copiapó grew rapidly.

This regional economic development led to sharp increases in water uses and applications to the DGA for new water rights. Rights to the surface waters of the basin were already almost fully allocated and in the 1980s, under the new Water Code, the DGA began granting large amounts of new groundwater rights. By the 2000s the DGA had granted paper rights to several times more groundwater than was annually recharged and water tables were going down steadily or dramatically in some parts of the basin. The worst affected was the middle basin where the city of Copiapó and most of the traditional agriculture were located (the new fruit plantations were mainly upstream). The river dried up by the time it was halfway to the ocean. Mining companies and the urban water supply company paid higher prices for water rights than farmers could pay, and could also afford to pay higher energy costs for pumping, which caused some agricultural land to go out of production.

By 2007, competition and conflict among different water users reached a level so severe that 'Copiapó' became synonymous with water crisis and governance failure in Chile. The Chilean government promoted a water roundtable (*mesa del agua*) consisting of representatives of most water users and stakeholders, in the hope that voluntary discussion would lead to political consensus and support for strong regulatory or self-regulatory action. Little came of it and the conflict in Copiapó continues unabated, with the owners of paper rights claiming several times more water than is physically available.<sup>8</sup>

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<sup>8</sup> For more background see Skoknic (2009a, 2009b); Rivera (2012a, 2012b); Fuster et al. (2014). I am a co-author of the latter document. I served as adviser to two projects of the University of Chile on groundwater management in northern Chile, one in

The Copiapó case illustrates critical structural flaws in Chilean water management, particularly as revealed by the DGA's regulatory behaviour. A recent paper by Bitran et al. (2014) provides a detailed empirical account of the legal, administrative, and technical factors that led to the crisis: that is, why and how the DGA failed so badly to control over-allocation.<sup>9</sup> The DGA's errors included dividing the basin's main aquifer into six different administrative sections despite their physical hydrological connections, and granting rights to groundwater without carefully considering the interactions with surface water or based on obsolete assumptions of irrigation efficiency. Some of the DGA's problems were not the agency's fault: e.g. the lack of staff and resources to monitor and enforce groundwater use, and the lack of authority or capacity to review water rights transactions (despite the common pattern of a mining company buying irrigation water rights and then using them more intensively than the farmers had). Before the 2005 reform, the DGA could not even declare a zone of prohibition of new water rights unless existing private owners requested it.

Bitran et al. (2014: 859) conclude with five points:

[T]he dramatic overexploitation of the Copiapó Basin was the consequence first of failure in regulatory implementation and second of an extremely rigid regulatory framework that left limited room to adjust to changing conditions and the emergence of new information regarding water availability. Third, the government lacked initiative to adjust obvious pitfalls in the regulatory framework for legislation and fourth, the water use right owners, despite having the possibility of closing the market [i.e. blocking future water rights], opted for running a race of over-application and over-investment in water use rights. Finally, (...) the market price of water more than tripled in the period 2000-2011, consistent with a situation of higher scarcity.

Although the DGA's poor administration was obviously a major factor in the Copiapó crisis, the larger political and legal context is crucial to understanding what happened. The agency had little choice but to act as it did: the Water Code forced it to grant water rights if certain formalities were met, and in many cases where the DGA exercised some discretion, it was overruled by the nation's Controller General. Moreover, it is by political decision and not by accident that the DGA has always lacked the budget and personnel to monitor and enforce water use. In short, far from being an aberration, the Copiapó case reveals the essence of the Chilean water model.<sup>10</sup>

The adjacent valleys of La Ligua and Petorca in north-central Chile, about 150 km north of Santiago, are another example of groundwater overuse and severe water conflict. This area was transformed by the fruit boom in the 1970-1980s (especially avocados and citrus), and new plantations spread up the uncultivated hillsides. Unlike Copiapó, nearly all water uses are agricultural. Like Copiapó, there are many more paper rights than wet water, it is widely recognised that illegal water uses are common, and people in some parts of the basin have got their domestic water in trucks for years (Budde, 2004, 2009a, 2009b; Guiloff, 2013; Instituto Nacional de Derechos Humanos, 2013; Mundaca, 2014).

The worst conflicts are between small and large farmers. Small farmers in this area have organised themselves in protest, creating and sustaining a local social movement that has achieved a national profile: MODATIMA (Movement for the Defence of Water, Protection of Land, and Respect for the

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Copiapó and the other in Azapa Valley, during 2011-2014. Both projects were directed by Rodrigo Fuster and funded by different agencies of the Chilean government.

<sup>9</sup> Bitran and Rivera had high-level government positions under the *Concertación*, so they offer an inside look.

<sup>10</sup> According to the Chilean Institute of Engineers, in a report whose lead author was former DGA Peña, "From the late 1980s, the interest in groundwater in Chile increased explosively... However, the country was not prepared, from the legal and technical points of view, for an increase in groundwater exploitation of the magnitude which took place" (Instituto de Ingenieros, 2011: 6).

Environment). MODATIMA has protested not only the crisis in La Ligua/Petorca but also the Water Code in general, and has been at the forefront of recent calls to nationalise water rights (discussed below).<sup>11</sup>

### **Type (3): Socio-environmental conflicts with water as a key component**

The third type of major water conflicts in Chile are part of broader socio-environmental conflicts, usually over specific development projects. Examples include HidroAysén, the series of large hydropower dams proposed for rivers in the rainy south of Patagonia, and Pascua Lama, the large mine proposed for the high Andes in northern Chile, where glaciers are the headwaters of local rivers. I lack space here to describe these examples in detail. They are high-profile conflicts that have lasted for years, involving widespread social and environmental effects including water quality, conservation of protected natural areas, and cultural heritage. These conflicts are also notable for their international character, involving both neighbouring Argentina and international organisations concerned with indigenous and environmental issues.

These conflicts have mostly played out in terms of environmental law and regulation, rather than the Water Code. Modern environmental law in Chile dates from 1994, when the Aylwin government passed a basic framework law, whose main emphasis was on creating an environmental impact assessment process that had significant constraints (Tecklin et al., 2011). This framework was widely criticised as weak and it was overhauled in 2010 to make it both more effective and more open to public participation. The new law upgraded the National Environment Commission to a Ministry of Environment; established two new agencies to run the environmental impact assessment process and to monitor and enforce compliance with environmental regulations; and created a new system of special environmental courts. The emblematic environmental conflicts of the past decade have both forced and tested the development of the environmental regulatory framework.

Many of these emblematic conflicts have involved *energy* projects. With hydropower projects, water rights issues are central but the driving forces have come from the energy sector, especially electricity law and policy (Bauer, 2009), and environmental law has provided the framework for making decisions about new projects. Moreover, in recent years Chile has strengthened laws requiring input from indigenous peoples when their lands are affected, which presents new obstacles to large development projects. Chile's ratification of Agreement 169 of the International Labour Organisation is the most important example.<sup>12</sup>

## **WATER POLITICS AND POLICY ANALYSIS SINCE 2005**

In this section I review the evolution of Chilean water politics and policy analysis since the Water Code reform in 2005. In so doing I focus on type (4) water conflicts. I look at politics first and policy analysis second, although of course the line between them is blurred, until 2014 when President Bachelet took up office for a new term. During this period water *conflicts* became the dominant theme in debate rather than water *markets*, which had been the dominant theme since the 1990s. The section ends with a discussion of the current Water Code reforms proposed by the Bachelet government in 2014.

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<sup>11</sup> See interview with one of MODATIMA's leaders: 'Rodrigo Mundaca: El país se seca', [www.observatorio.cl/2014/rodrigo-mundaca-el-pais-se-seca](http://www.observatorio.cl/2014/rodrigo-mundaca-el-pais-se-seca), 23 Oct. 2014 (last accessed on 12 Jan. 2015).

<sup>12</sup> See Contesse, 2012. Environmental NGOs have followed these cases closely and have a lot of information and documents in their archives, especially Ecosistemas, [www.ecosistemas.cl](http://www.ecosistemas.cl), Fundación Terram, [www.terram.cl](http://www.terram.cl), Observatorio Latinoamericano de Conflictos Ambientales, [www.olca.cl](http://www.olca.cl), and Chile Sustentable, [www.chilesustentable.cl](http://www.chilesustentable.cl).

## Renewed calls for nationalisation and pressure from the left

Ironically, the DGA's Peña and Jaeger had only a short rest from their years of effort to overcome conservative political opposition before the reformed Water Code was challenged by environmentalists and politicians on the left wing of the governing coalition (*Concertación*). The first government of President Bachelet took office in 2006 and Peña retired from government service, although he remained active in public debate about water policy. Within a couple of years, prominent politicians in the *Concertación* introduced new legislation to 'nationalise' water, in much stronger terms than the 2005 reform.

Senator Guido Girardi, of the left-of-centre Party for Democracy (PPD), argued in 2008 that all waters and water rights should be declared to have 'public utility' for purposes of expropriation, so that the state would not have to pay compensation for changing the legal definition of water rights. After that declaration, the state would grant administrative concessions to private water users, instead of the current property rights. Girardi was supported by Sergio Bitar, the Minister of Public Works (and also member of PPD), who added a proposal to give the state the power to cancel water rights if they were not used over some period of time. Both of these changes would require a constitutional amendment first, to amend the property clause (La Nación, 2008).<sup>13</sup>

Later in 2008 a group of Deputies in the Chilean Congress organised to push this approach further by creating the Broad Front for Nationalisation of Water. These representatives were known as the *bancada verde*, the 'green seats' in the chamber. Their proposed bill, like Senator Girardi's, would have reformed the Constitution to declare all freshwater to be owned by the nation, with the state empowered to grant private concessions to use that public water (Ahumada, 2008). This is essentially what current legislation (the Water Code) already says, but it raises the language to the higher level of the Constitution. Meanwhile, in August 2008 the Catholic Bishop of Aysén, Luis Infanti, published a 90-page Pastoral Letter entitled 'Give us this day our daily water' (*Danos hoy el agua de cada día*). Bishop Infanti's letter was an eloquent defence of nature and culture in Patagonia and a passionate attack on neo-liberalism.

Public Works Minister Bitar kept the reform proposals alive during 2009. At one point he explained that the constitutional change included several elements: (1) to raise water's legal status as a public good (*bien nacional de uso público*) from legislative to constitutional rank; (2) to establish state authority to reserve flows of surface water or groundwater for various public purposes; (3) to establish new procedures for the state to grant, recognise, transfer, and/or cancel water rights; and (4) to establish river basin organisations (El Mostrador, 2009).

During this period, water conflicts and crises were frequent headline news in Chile, e.g. Copiapó and Petorca. Another example was a 2009 cover story, 'Water is boiling', published by the glossy Chilean business magazine, *Capital* (Sapag, 2009). The article begins by claiming "the war for water is not a myth. It is real, tangible. It is in the streets, with protests. It is in the courts, with suits and countersuits. It is at the negotiating tables, with deals worth millions" (Sapag, 2009: 40).

The author then describes the key water conflicts in Chile and illustrates them with diverse examples from the length and breadth of the country. The article shows the high-pitched tone of public debate at the time, particularly from the perspective of private business.

The first Bachelet government announced a new push for water law reform in early January 2010, at the end of its term in office. That was in the heat of the political campaign to elect Bachelet's successor, and the government obviously considered water rights reform to help win votes for its candidate. The President's Message presenting the bill to Congress argued that the current water rights model was

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<sup>13</sup> For a critique of the idea of 'nationalizing' water in Chile, basically because it was redundant and unnecessary, see the op-ed by Peña and Jaeger (2008).

unbalanced, even after the 2005 reform, and that a constitutional amendment was the first step towards greater balance. Declaring waters to be public property in the Constitution would not require compensating private rights-holders because the formal ownership would not change – what would change would be how water rights could be *used*. Thus the government argued that the legal security of water rights would not be affected (Bachelet et al., 2010).

### **Piñera government, 2010-2014**

Chilean voters elected the businessman Sebastian Piñera, leader of the right-wing political party *Renovación Nacional*, to be President in 2010. Most voters thought it was finally time for the alliance of two right-wing parties (*Renovación Nacional* [RN] and *Unión Demócrata Independiente* [UDI]) to rotate into power and control the executive branch, after 20 years in democratic opposition to the *Concertación*. The Piñera government immediately withdrew the proposed constitutional reform about water rights and closed ranks to defend the Water Code and the Chilean model of water markets.

The new government's DGA leadership developed the diagnosis that the Water Code's design was basically correct but previous governments had administered the Code poorly, particularly in the area of groundwater over-allocation. Thus the Piñera government emphasised improving and stimulating the water market as the main policy approach, just as the right-wing parties had done when opposing Water Code reform before 2005. Neo-liberal economic influence was strong through the presence of Maria de la Luz Domper as a key water adviser to the Minister of Public Works. Domper had worked for many years as a researcher at the Institute for Liberty and Development, the leading neo-liberal policy think-tank in Chile (Urquieta, 2010; Instituto Libertad y Desarrollo, 2010).

Nevertheless, public opposition to the Water Code continued to be strong. According to a study by the NGO Chile Sustentable, from 2008 to 2012 there was a flurry of proposed legal reforms in the Chilean Congress, including eight formal proposals to amend the Constitution (Szigeti, 2013). All of these bills aimed to repeal the water rights clause in the main constitutional article governing property rights (Art. 19, No. 24), in favour of "recovering public ownership" of water (*recuperar el dominio público*).<sup>14</sup> In addition, there were five more proposals between 2008 and 2012 to reform the heart of the Water Code, with the same purpose of "recovering public ownership" in various specific situations: e.g. to declare that water for human consumption should have a higher priority than other water uses. This is what 'nationalising water' means in contemporary Chilean debate.

Finally, a group of Deputies got organised in 2012, first to create a 'transversal water group' in the Chamber (*bancada transversal del agua*) and then to create a permanent Commission on Water, Desertification, and Drought. This congressional commission aimed to be a watchdog of the government's executive branch, and to offer a public arena for civil society and NGOs to express their views (Szigeti, 2013).

Public opposition to the Water Code remains visible. On Earth Day 2013 (22 April), a group of Chilean NGOs organised a 'march-carnival for the defence and recovery of water'. The group wrote:

[I]n Chile there is water, but the wall that separates it from us is called profit... We must break down the wall of profit so that water can once again run free in our valleys and feed life, not the insatiable pockets of this culture of death.<sup>15</sup>

<sup>14</sup> The Constitution now says: "The rights of private parties over waters, when recognized or constituted according to law, will grant their owners property over those rights". Art.19, N.24.

<sup>15</sup> The group's declaration was posted at <http://fech.cl/marcha-carnaval-por-la-defensa-y-recuperacion-del-agua-22-de-abril/> (accessed on 14 April 2013).

The NGOs' declaration argued that access to water is a basic human right and should not be treated as a commodity; that water should be collectively owned and locally managed; and that 'privatising instruments' should be repealed.<sup>16</sup>

In Chile's national election campaign in 2013, presidential candidate Bachelet included in her platform the familiar proposal to reform the Constitution and the Water Code. In addition, "[i]n the first 100 days of government, we will name a Presidential Delegate for Water Resources, with exclusive dedication, to identify and advance solutions for the scarcity of water in the country" (Bachelet, 2013: 32, 73). After she was elected and took office in March 2014, her government moved forward in this area with new initiative. (The centre-left coalition of political parties supporting Bachelet was now called the New Majority instead of the *Concertación*, reflecting some degree of political re-alignment towards the left, as indicated by the Communist Party's joining the coalition.) Public protest has continued as well, including the second annual National Mobilisation for the Recuperation and Defence of Water in April 2014 (Segura, 2014).

### Current water policy research and analysis

My own recent work in Chile has focused on hydroelectric power and the relationship between water and energy laws (Bauer, 2009). Hydropower is a key example of what is now called the 'water/energy nexus', which means that water systems and energy systems interact in complex ways and at different scales. Global climate change has turned the spotlight on the water/energy nexus because of its central role in both mitigation and adaptation. Most efforts to mitigate climate change focus on changing energy use, especially to reduce carbon emissions from fossil fuels, while it is through the effects on water resources that societies feel the impacts of climate change most strongly. Hydropower has a contradictory position in this context: there is pressure worldwide to increase hydropower development because it emits less carbon, but the changes in water systems make them less reliable supplies for hydropower.

Hydropower dams are simultaneously a use of water and a source of electricity, and therefore they are regulated for different purposes along the two different axes of water law and electricity law. In the context of water law, hydropower must be governed in relation to multiple other uses of water in shared river basins. In the context of electricity law, hydropower must be governed in relation to other sources of electricity, mainly thermal power generated by burning fossil fuels. Recent passage of renewable energy laws will affect hydropower as well.

Bauer (2009) describes the distinct roles of hydropower in Chile's water sector and electricity sector.<sup>17</sup> In the water sector, hydropower has enjoyed a privileged position in a weakly regulated water rights system, as shown in type (1) water conflicts. In the electricity sector, hydropower has been the key to national power generation, and dams with reservoir storage have been especially strategic. Since privatisation of the electric sector in the 1980s, the dynamic relationships and sometimes conflicting interests between hydropower and thermal power have been at the heart of the sector's political economy. The tension between hydropower and thermal power, when owned by competing private companies, explains many of the conflicts within the Chilean electricity sector over the past 15 years.

I concluded that Chilean electricity law had granted de facto property rights to water to the owners of hydropower dams. These are not the water rights defined by the Water Code but the rules that effectively govern how rivers are controlled, determining for what purposes the rivers are used and for whose benefit. Another way to put this argument is that electricity law trumps water law when

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<sup>16</sup> Ibid. For investigative journalism that highlighted criticisms of water markets and the Water Code, see Arellano (2013a, 2013b, 2014).

<sup>17</sup> See also Prieto and Bauer (2012) for detailed institutional analysis of hydropower in Chile, including the problems of environmental flows in the current framework.



hydropower is present. The two laws do not always conflict, but water law is secondary and facilitates the dominance of electricity regulations. A good example of this is the basic principle that water is free, a principle that is rarely questioned in Chile in spite of its major impact on electricity prices. Another example is that rivers that have hydropower dams are in fact more regulated – for purposes of the electricity grid – than they seem from the *laissez-faire* viewpoint of the Water Code.

The water/energy nexus is also critical to groundwater use and type (2) conflicts, since the cost of energy is the key to bringing water to the surface for use, as well as type (3) conflicts with their intersectoral nature.

Sara Larraín is a prominent Chilean environmentalist who has staked out a special interest in water issues.<sup>18</sup> In 2010, Larraín wrote a sharp and relentless critique of the Chilean water model and of neo-liberalism in general.

In synthesis, it is possible to conclude, after 30 years of applying the 1981 Water Code, that that regulation shows severe problems for the access, security and environmental sustainability of water administration, the consequence of which is the proliferation and deepening of conflicts over water in the country and the loss of democratic governability over this essential environmental patrimony (Larraín, 2010: 20).

Larraín calls the 2005 Water Code reform 'minimal and partial' and argues that water conflicts in Chile have worsened and more widespread (Larraín, 2010: 40).

To resolve these water conflicts democratically requires recovering a rights-based approach, and recovering water as a common good, as a human right, and as a basic resource for life which needs to be managed in a public and participatory manner (Larraín, 2010: 49).

Larraín's critique was the Introduction to an edited book which argued that water conflicts are common and widespread in Chile, and the Water Code makes them worse (Larraín and Poo, 2010). The book involved 25 authors and collaborators, most of whom were local activists. There are 26 specific cases of water conflicts, spread out from north to south over the entire country.<sup>19</sup> Most of the water conflicts in northern Chile involved the mining sector; most conflicts in central and southern Chile involved hydropower development.<sup>20</sup>

In 2011, the World Bank released its most important document on Chilean water issues since the 1990s: *Chile: Diagnosis of Water Resources Management* (in Spanish only). This report was originally requested by the first government of President Bachelet (2006-2010), and it was completed during the government of President Piñera. The report synthesised the work of seven local experts, a half-dozen World Bank staff-people and consultants, and several counterparts in the DGA (World Bank, 2011: 1-2).

The Bank's *Diagnosis* is a wide-ranging, thorough, and constructive critique of Chile's water system. The future water situation in Chile is expected to be marked by increasing demands for water and by a changing climate. The report lists 14 major 'challenges' (*desafíos*) – that is, problems – facing water management in Chile. Eight challenges involve legal and administrative aspects, including property rights and institutions, and the other six challenges involve organisational aspects. I list them here in

<sup>18</sup> See [www.chilesustentable.net](http://www.chilesustentable.net), the website of her NGO.

<sup>19</sup> Each case includes some introductory background; the relationship to the current legal framework; the position and action of the State; and the position, action, and proposals of the community around the conflict.

<sup>20</sup> See Budds (2004, 2009a, 2009b), discussed above in the example of La Ligua/Petorca, for a political ecological critique. Bitran et al. (2014) examine the DGA's regulatory behaviour in the Copiapó case, discussed above. Prieto (2014) looks at the case of indigenous water rights and politics in the Loa River Basin in the northern desert region of Atacama, and he shows that the 'market' in practice is much different from the market in theory. See also Yañez and Molina (2011). Clarvis and Allan (2013) study the Aconcagua River Basin in central Chile from the theoretical perspective of resilience and adaptation, and they conclude that the Chilean model works poorly. Donoso (2013) offers an economist's review of the experience of water markets.

the Bank's language in order to indicate the report's overall message.<sup>21</sup> The challenges involving legal and administrative aspects were the following:

- *Protect water rights of vulnerable social groups* [including indigenous peoples]....
- *Improve protection for ecosystems and ecosystem services* [including environmental flows]....
- *Improve water markets* [through improving information and reducing transactions costs]....
- *Maintain hydrological security of water rights* [i.e. so that paper titles correspond to wet water, since discrepancies between the two are a growing source of conflicts]....
- *Keep improving the effective use of water rights* [as opposed to hoarding or speculation]....
- *Make groundwater management more sustainable*....
- *Deepen existing measures to assure water quality*....
- *Improve the public registry of water rights* (World Bank, 2011: viii-xi).

The challenges involving organisational aspects were equally daunting:

- *Strengthen the DGA* [to address its multiple weaknesses and the fact that many other government agencies affected water use as well]....
- *Strengthen users' organisations* [especially the vigilance committees]....
- *Improve systems of information and communication*....
- *Coordinate within and across sectors* [i.e. deal with externalities]....
- *Integrate basin management and promote the participation of stakeholders* [basin approach almost completely lacking in Chile]....
- *Improve resolution of conflicts* (World Bank, 2011: xi-xiv).

The Piñera government announced the completion of the Bank's report to the public in 2011, but afterwards the report faded from view.<sup>22</sup>

The Chilean consultant who argued most strongly for the last bulleted item above – 'improve resolution of conflicts' – was the country's leading academic water lawyer, Alejandro Vergara Blanco, who also has a busy private practice. Vergara has long been a proponent of the Chilean water rights model, although in the 1990s he recognised that the model had flaws that should be corrected (Bauer, 2004: 84-85). He has fully embraced the three laws that are the foundation of the Chilean water model, all of which were passed by the military government during 1979-1981.<sup>23</sup> In his latest book, Vergara refers to the current model as a "neomodern water law, marked by a series of incentives favouring a better use of water" (Vergara, 2014: 13).

In recent years, Vergara has adopted the early work of Elinor Ostrom on common property, especially the idea that common property is a third basic category of property regimes, in addition to

<sup>21</sup> The subheadings listed in the text are taken from the Executive Summary, pp. vii-xiv. Some wording differs slightly in the main body of the report. In the report's confusing terminology, 'legal and administrative' aspects refer to fundamental institutions of property rights, as opposed to the 'institutional' aspects, which refer to specific organisations.

<sup>22</sup> Chile's Institute of Engineers, a professional association, published two documents that were similar to the World Bank's diagnosis, identifying a list of priority issues and proposing bureaucratic responses (Instituto de Ingenieros, 2011, 2012). The Institute's Water Commission was led by former DGA Peña.

<sup>23</sup> The three laws were D.L. 2,603 of 1979, the 1980 Constitution, and the 1981 Water Code (Vergara, 2012: 1).

private property and state property.<sup>24</sup> In 2012, he wrote a paper that aimed to refocus public debate on what he thought were the critical issues in Chilean water rights (Vergara, 2012). He criticised the Bachelet government's 2010 proposal to reform the Constitution's water rights clause (discussed above), as well as a proposed law to increase the role of private water users' organisations in procedures to 'regularise' water rights titles, which Vergara said would worsen water conflicts because it misunderstood the proper role of those organisations in relation to the state.

In contrast, Vergara proposed a different agenda that focused first on the 'self-management' (*autogestión*) of water users' organisations, with a minimum of state interference, and second on the creation of specialised water courts. The two essential tasks of the DGA, in his view, were to grant water rights to private parties and to maintain a complete and updated system of record-keeping and information. These tasks involved the *origin* of water rights, in Vergara's terms. The *distribution* of water according to water rights, however, corresponded to the users' organisations and not to the DGA, because it involved the *exercise* of water rights, which Vergara calls the "self-management of a common resource" (*autogestión de un recurso común*).

Vergara argues that the legal nature of water (*naturaleza de las aguas*) has changed through the process of the users' self-management. Although water has been legally defined as a national good in Chile since the 1850s, in practice it has now become common property, that is, a common good collectively managed by its local users during the past 30+ years of the current Water Code.<sup>25</sup> These common rights should protect private water rights from state regulation, although the private rights remain individual and transferable commodities. It is a neo-liberal interpretation of common property.<sup>26</sup>

Vergara writes that water conflicts have been worsening in Chile and he argues that water users' organisations should be given more authority to manage water: especially the vigilance committees that operate on a partial river-basin scale. He also argues that Chile should create new specialised water courts. He summarises the problems, delays, and frequent incompetence of the current judicial system in dealing with complicated water conflicts involving both legal and other factors. He believes that one successful model is the 'panel of experts' that was established under Chile's Electricity Law (as reformed in 2004). The panel is a tribunal of technical experts including lawyers, economists, and engineers, who decide most disputes about electricity regulation. According to Vergara, "the panel of experts has pacified an industry", i.e. the electricity sector, because its decisions have been 'technical' rather than 'political' (Vergara et al., 2013: 246). He suggests a similar tribunal for water rights conflicts.

In short, this section shows that worsening water conflicts have become the dominant theme in water policy research and analysis in Chile, notwithstanding the variety of theoretical and political viewpoints.

### **President Bachelet's proposals and debate in 2014**

President Bachelet took up office for her second government in March 2014, with a broad agenda to reform Chile's neo-liberal model, especially in emblematic areas such as education. On 21 May she delivered a major national speech that outlined her new government's plans and priorities. She announced a new push for water rights reform, pledging to amend the Constitution's property clause and to 'substantively' (*sustantivamente*) modify the Water Code. These comments triggered a great deal of public debate in the Chilean media, as different experts and stakeholders tried to interpret what

<sup>24</sup> Vergara cites *Governing the Commons* (1990).

<sup>25</sup> Water's legal name as a national good for public use, says Vergara, "has lost connection with reality!" (Vergara, 2012: 7).

<sup>26</sup> Vergara (2012: 6-9). Vergara does not cite or show awareness of Ostrom's more recent work on socio-ecological systems, e.g. Ostrom (2007).

exactly the government would propose (Orellana, 2014). How far does the government want to move the water rights pendulum? How far will Congress and the higher courts agree to move it?

The new Presidential Delegate for Water Resources, Reinaldo Ruiz, held a series of public and private meetings to gather input about the possible alternatives. He was quoted as saying:

I have never talked about expropriating or nationalizing water, or anything like it. These are rights granted by the State and the State has the right to request that they be returned. And today that cannot be done. We are not expropriating or nationalizing, because this is returning something that always belonged to the nation as a whole (El Dinamo, 2014).

The Minister of Public Works made the same argument: "We are going to limit the exercise of water rights for the sake of the common good, because that is the solution that is easiest to implement without obligating the State to pay the cost of expropriation" (Diario Financiero, 2014). We do not know yet whether the Supreme Court and Constitutional Tribunal will share this interpretation.

While the executive branch worked on its specific proposals before making them public, the water commission of the Chamber of Deputies was asked to pause in its legislative work for a few months. The government sent its proposed legislation to Congress in September 2014, replacing the draft prepared by the Deputies. The bill is strong in some ways, but it is uneven and it lacks a coherent and pragmatic vision of a path forward to improving water governance.<sup>27</sup>

The government argues that "the regulation of water resources requires a change that intensifies the public regime of waters, strengthening the powers of the Administration in constituting and limiting rights to use water, and including, protecting, and prioritising uses needed for subsistence" (ibid, p.2). The most important specific changes include:

1. establishing a 30-year time limit for any new water rights, and cancelling rights that are not used for four or eight years (for consumptive and non-consumptive rights, respectively);
2. giving the state the power to temporarily restrict water uses or redistribute water in the public interest (e.g. in a drought emergency);
3. declaring human consumption and sanitation to be the highest priority uses of water, and giving the state the power to constitute 'reserves' of surface water or groundwater in order to supply those priority uses as well as ecosystem preservation;
4. changing the Water Code's language to emphasise public rather than private ownership, e.g. from 'owner' to 'holder' of water rights, and from 'ownership' and 'free disposition' of rights to their 'use and enjoyment'.

The immediate political reactions in Chile were predictable: some on the right criticised the government for threatening the security of private property rights, and some on the left criticised its failure to more fully nationalise water.<sup>28</sup> Chilean political views about the core principles of water law are as polarised in 2014 as they have been since the early 1990s, when the long deadlock over Water Code reform began. Indeed the conflict may be more polarised today because left-wing protests and social movements about water have become stronger in recent years, while right-wing views in favour of the Water Code are basically unchanged, and the partial reform of 2005 left few people satisfied. Despite the echoes from 10-20 years ago, however, the debate today takes place in a different national political context (Atria et al., 2013).

<sup>27</sup> Mensaje No. 459-362, from the President to the Chamber of Deputies, Formula indicación sustitutiva al proyecto de ley que reforma el Código de Aguas, 8 Sept. 2014.

<sup>28</sup> Declaración del Movimiento Social por la Recuperación del Agua y de la Vida frente al proyecto de ley que reforma el Código de Aguas, 13 Oct. 2014, [www.observatorio.cl](http://www.observatorio.cl) (last accessed on 12 Jan. 2015).

Most of the public debate has revolved around the first bulleted item above, i.e. new rules for time limits on water rights, following the government's lead in giving it prime billing. To me the government's strategy makes little sense: the issue lends itself to polarised views about matters of principle, which will block agreement, and the practical consequences of this reform if approved would likely be minor and hard to implement. It is a distraction from more important issues. There seems to be broader support for the 3rd bulleted item although there too the practical impacts are not clear.

Although I share the view that the model needs stronger public regulation, the government's position has some problems. One is that the government is putting too much emphasis on new legal language and declarations of principle, and too little emphasis on the institutions of governance that will have to implement new rules and procedures in practice. The government argues for stronger DGA authority in regulating the use of private water rights, but does not present a plan to strengthen the agency's capacity or political hierarchy. How would a stronger DGA work in relation to other government agencies, the courts, private water users and their associations, and NGOs? We don't know and few reformers are talking about it. In short, one danger in the current debate in Chile is that reformers may put all their emphasis on defining water as 'public', in ways that may not solve any concrete problems or leave the DGA in better shape.

Another problem is that the government is too casual about the legal security of water rights. A sizeable piece of the Chilean economy today is built on the assumption that private water rights are secure from government regulation. If the government wants to argue for a stronger DGA, it needs to convince people that the DGA will use its new powers well, with technical expertise and balanced judgment. From the standpoint of day-to-day water management and continuing investment in the system's maintenance, the current system should not be abolished without a workable alternative to replace it.

In my view, several elements of water reform are essential to improve water governance in the long term:

1. affirm that private rights to use water are indeed property rights rather than merely administrative permits or concessions, while clarifying that these rights are subject to more duties and restrictions in the public interest than has been the case since 1981. This means recognising that water rights are an economic good, but not a pure commodity;
2. strengthen government regulatory capacity to determine and defend public interests in water use. This means increasing the DGA's regulatory authority, technical capacity, staff and budget, all of which would raise DGA's political profile as an arena for decision-making. One way to strengthen DGA might be to transform it into a new water agency at a higher level of government;
3. strengthen judicial capacity to review DGA actions and to rule on water conflicts involving public policy and regulation. This means increasing judicial training and resources on a scale similar to Chile's judicial reforms in criminal law over the past two decades;
4. guarantee effective rights to public participation in both (2) and (3).

I can argue in favour of a stronger DGA only because I take the views of the DGA's critics seriously. A stronger DGA should be counterbalanced by other institutions including a more capable court system and greater oversight by Congressional committees, both of which should be channels for other interests and stakeholders.

## **SUMMARY AND CONCLUSIONS**

I have shown in this paper that water conflicts in Chile have changed in the 10 years since the Water Code was reformed in 2005. They are more entangled, entrenched and multi-sectoral, and more

nationally visible and politically high-profile. My evidence comes from a variety of specific cases and my continuing research in Chile, including interviews with key informants, analysis of media and legal and policy documents, and collaboration in research and outreach projects. The cases show continuing or worsening conflicts among multiple water uses, as demands have increased in river basins and groundwater aquifers – what I described as types (1) and (2) water conflicts. The situation confirms my assessment 10 to 15 years ago, that the Water Code's institutional framework was incapable of handling complicated water conflicts, because the DGA had no power and the courts had some power but little idea of how to use it. This created a partial vacuum of public governance. At that time the dominant issue in Chilean water politics was the water market, not water conflicts or governance, and the general public was barely aware of the issues.

The difference today is that water conflicts are deeper, wider and more obvious, and they are more closely tied to energy and environmental conflicts – what I called type (3) water conflicts. Both energy and environmental policies have been dynamic and highly contested areas in Chile in recent years, and efforts to improve water governance must now deal with energy and environmental governance, too (Tecklin, 2014). For example, the Bachelet government's new energy policy includes an emphasis on regional land use planning (*ordenamiento territorial*) that would study river basins to decide where to locate new hydropower dams. In short, the current institutional model cannot handle these increasingly complex water conflicts.

In this context, creating special water courts may be a short-term solution that creates longer-term problems. Chile has created a number of specialised courts in recent years, whose 'judges' have typically included economists and engineers as well as lawyers. The goal has been to create an effective alternative to the ordinary court system. Judges in special courts would be expert in technical regulatory issues, and so their decisions would be faster and better than in the ordinary courts. Relevant examples include the Court to Defend Free Enterprise, i.e. anti-trust, for issues of monopoly power; the panel of experts for the electricity sector; and the new environmental courts.

Although special water courts might have those advantages, their impact is likely to be limited. Their authority and focus would be technical rather than overtly political, as much as possible, and they would not offer an arena for broader public discussion and decision-making. Indeed, when Vergara refers to the success of the electricity sector's panel of experts in resolving conflicts, he does not mention the fact that national energy policy in Chile continues to be a source of deep political, economic and environmental conflict. The panel of experts' arena for action is limited and fundamental political and policy decisions are made elsewhere.

The deeper problem of Chile's trend towards specialised courts is that it makes regulatory governance more fragmented, at a time when natural resource and environmental problems demand a more integrated response. One advantage of strengthening the ordinary judiciary is that it is better positioned than special courts to check or balance state authority in a systematic way. This is important when the overall direction of reform is to strengthen state regulation.

This is a fundamental lesson of Chile's 35 years of experience of water markets and water privatisation. The result of decades of neo-liberal law and economics is a structural weakness in capacity for water governance. State regulatory authority and discretion have been weakened, the judicial system has been unevenly strengthened to compensate, and Congress is weak in relation to the President. As water conflicts merge with energy and environmental conflicts, the tasks of governance loom larger. It is unfortunate that the Chilean government has chosen to frame the argument in terms of how many years a future water right might last and how long a right can go unused without forfeit.

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## REFERENCES

- Aguilera, F. and Sanchez-García, J. 2005. Water markets in Tenerife: The conflict between instrumental and ceremonial functions of the institutions. *International Journal of Water* 3(2): 166-185.
- Ahumada, R. 2008. Agua que has de vender déjala correr. *La Nación*, 8 October 2008.
- Arellano, A. 2013a. La historia del discreto empresario que se transformó en el zar de las aguas en Chile. *ciperchile.cl*, 10 Dec. 2013.
- Arellano, A. 2013b. Cómo se fraguó la insólita legislación que tiene a Chile al borde del colapso hídrico. *ciperchile.cl*, 12 Dec. 2013.
- Arellano, A. 2014. Experto en manejo de aguas: 'Alguien tiene que tener autoridad y poder para regular'. *ciperchile.cl*, 9 April 2014.
- Atria, F.; Larraín, G.; Benavente, J.M.; Couso, J. and Joignant, A. 2013. *El otro modelo: Del orden neoliberal al régimen de lo público*. Santiago de Chile: Debate.
- Bachelet, M. 2013. Programa de gobierno 2014-2018. Campaña presidencial Michelle Presidente. Santiago.
- Bachelet, M., Chacra, S.B. and Quesnay, J.A.V. 2010. Mensaje de la Presidenta, No. 1774-357, 6 January 2010.
- Bakker, K. 2010. *Privatizing water: Governance failure and the world's urban water crisis*. Ithaca: Cornell University Press.
- Bauer, C. 1998a. *Against the current: Privatization, water markets, and the state in Chile*. Boston, MA: Kluwer Academic Publishers.
- Bauer, C. 1998b. Slippery property rights: Multiple water uses and the neoliberal model in Chile, 1981-1995. *Natural Resources Journal* 38(1): 109-155.
- Bauer, C. 2004. *Siren song: Chilean water law as a model for international reform*. Washington, DC: RFF Press.
- Bauer, C. 2009. Dams and markets: Rivers and electric power in Chile. *Natural Resources Journal* 49(3-4): 583-651.
- Bauer, C. 2013. The experience of water markets and the market model in Chile. In Maestu, J. (Ed), *Water trading and global water scarcity: International experiences*, pp. 130-143. New York, NY: RFF Press.
- Bitran, E.; Rivera, P. and Villena, M. 2014. Water management problems in the Copiapó Basin, Chile: Markets, severe scarcity, and the regulator. *Water Policy* 16(5): 844-863.
- Budds, J. 2004. Power, nature, and neoliberalism: The political ecology of water in Chile. *Singapore Journal of Tropical Geography* 25(3): 322-342.
- Budds, J. 2009a. The 1981 water code: The impacts of private tradable water rights on peasant and indigenous communities in Northern Chile. In Alexander, W. (Ed), *Lost in the long transition: Struggles for social justice in neoliberal Chile*, pp. 41-60. Lanham: Lexington Books.
- Budds, J. 2009b. Contested H<sub>2</sub>O: Science, policy and politics in water resources management in Chile. *Geoforum* 40(3): 418-430.
- Budds, J. 2013. Water, power, and the production of neoliberalism in Chile, 1973-2005. *Environment & Planning D: Society and Space* 31(2): 301-318.

- Clarvis, M. and Allan, A. 2013. Adaptive capacity in a Chilean context: A questionable model for Latin America. *Environmental Science & Policy* 43: 78-90.
- Conca, K. 2006. *Governing water: Contentious transnational politics and global institution building*. Cambridge, MA: MIT Press.
- Contesse, J. (Ed). 2012. *El Convenio 169 de la OIT y el derecho chileno*. Santiago: Ediciones Universidad Diego Portales.
- Cruse, L. (Ed). 2008. *Water policy in Australia*. Washington, DC: RFF Press.
- Diario Financiero. 2014. Gobierno busca evitar la expropiación en su fórmula de reforma constitucional para el agua. [www.df.cl](http://www.df.cl) (accessed on 22 May 2014).
- Donoso, G. 2013. The evolution of water markets in Chile. In Maestu, J. (Ed), *Water trading and global water scarcity: International experiences*, pp. 111-129. New York, NY: RFF Press.
- Dubash, N.; Dupar, M.; Kothari, S. and Lissu, T. 2001. *A watershed in global governance? An independent assessment of the World Commission on Dams*. Washington, DC: World Resources Institute, Lokayan, and Lawyer's Environmental Action Team.
- El Dinamo. 2014. Los lineamientos y modificaciones del delegado presidencial para los derechos de agua. [www.eldinamo.cl](http://www.eldinamo.cl) (accessed on 27 May 2014)
- El Mostrador. 2009. El agua como derecho constitucional. 21 September 2009.
- Fuster, R.; De la Fuente, A.; León, A.; Bauer, C.; Magner, N.; González, L.; Herrera, P.; Prohens, F.; Silva, K.; Astorga, K.; Palacios, A.; Labra, F.; Lillo, G.; Saavedra, V.; Jara, P.; Moya, H.; Soto, J.; Valdivieso, R.; Vidal, K.; Muñoz, N. and Olivera, L. 2014. Informe técnico de avance: Sistema piloto de banco de aguas geoespacializado en los sectores 5 y 6 del acuífero de Copiapó. Proyecto CORFO #13BPC3-19056. Unpublished document.
- Garrick, D.; Bark, R.; Connor, J. and Banerjee, O. 2012. Environmental water governance in federal rivers: Australia's Murray-Darling Basin. *Water Policy* 14(6): 915-936.
- Global Water Partnership (GWP). 2000. *Towards water security: A framework for action*. Stockholm: GWP.
- Guiloff, M. 2013. El derecho al agua como un derecho humano: El caso de la Provincia de Petorca. In *Informe Anual sobre Derechos Humanos en Chile*, pp. 255-282. Santiago: Universidad Diego Portales.
- Hanak, E.; Lund, J.; Dinar, A.; Gray, B.; Howitt, R.; Mount, J.; Moyle, P. and Thompson, B. 2011. *Managing California's water: From conflict to reconciliation*. San Francisco: Public Policy Institute of California.
- Instituto de Ingenieros. 2011. *Temas prioritarios para una política nacional de recursos hídricos*. Santiago.
- Instituto de Ingenieros. 2012. *Hacia una gestión integrada de recursos hídricos: Una propuesta*. Santiago.
- Instituto Libertad y Desarrollo. 2010. *Los errores en el debate y la verdadera agenda en materia de agua*. Santiago.
- Instituto Nacional de Derechos Humanos. 2013. Derecho al agua. In *Informe Anual de Derechos Humanos*, pp.207-217.
- Jarvis, L. 1994. Changing private and public roles in technological development: Lessons from the Chilean fruit sector. In Anderson, J. (Ed), *Agricultural technology: Current policy issues for the international community*, pp. 243-266. Wallingford: CAB International.
- Jaeger, P. 2006. Del deseo a la necesidad: Lo importante de las modificaciones al Código de Aguas. Presented to Asociación Chilena de Abogados del Sector Sanitario.
- Jaeger, P. and Peña, H. 2013. *Del orden neoliberal al régimen de lo público, en materia de aguas*. XV Jornadas de Derecho de Aguas. Santiago: Univ. Católica de Chile.
- La Nación. 2008. Proyecto de ley busca nacionalizar el agua. 20 March 2008.
- Larraín, S. 2010. Introducción. In Larraín, S. and Poo, P. (Eds), *Conflictos por el agua en Chile: Entre los derechos humanos y las reglas del mercado*, pp. 15-49. Santiago: Chile Sustentable.
- Larraín, S. and Poo, P. (Eds). 2010. *Conflictos por el agua en Chile: Entre los derechos humanos y las reglas del mercado*. Santiago: Chile Sustentable.
- Lautze, J.; de Silva, S.; Giordano, M. and Sanford, L. 2011. Putting the cart before the horse: Water governance and IWRM. *Natural Resources Forum* 35(1): 1-8.



- Moore, D. and Sklar, L. 1998. Reforming the World Bank's lending for water: The process and outcome of developing a water resources management policy. In Fox, J. and Brown, L.D. (Eds), *The struggle for accountability: The World Bank, NGOs, and grassroots movements*, pp. 345-390. Cambridge: MIT Press.
- Mundaca, R. 2014. *La privatización de las aguas en Chile: Causas y resistencias*. Santiago: América en Movimiento.
- Orellano, G. 2014. Incertidumbre por alcances de la reforma al Código de Aguas. [www.elpulso.cl](http://www.elpulso.cl) (accessed on 22 May 2014)
- Ostrom, E. 2007. A diagnostic approach for going beyond panaceas. *PNAS* 104: 15181-15187.
- Peña, H. 2005. Meaning and scope of Water Code reform in Chile. *Circular N. 22*, Network for Cooperation in Integrated Water Resource Management for Sustainable Development in Latin America and the Caribbean. Santiago: U.N. Economic Commission for Latin America and the Caribbean.
- Peña, H. 2009. Taking it one step at a time: Chile's sequential, adaptive approach to achieving the three Es. In Lenton, R. and Muller, M. (Eds), *Integrated water resources management in practice*, pp. 153-168. London: Earthscan.
- Peña, H. and Jaeger, P. 2008. ¿Nacionalización del agua? *El Mercurio*, 20 December 2008.
- Prieto, M. and Bauer, C. 2012. Hydroelectric power generation in Chile: An institutional critique of the neutrality of market mechanisms. *Water International* 37(2): 131-146.
- Prieto, M. 2014. Privatizing water and articulating indigeneity: The Chilean water reforms and the Atacameño people (LikanAntai). PhD thesis. University of Arizona, Tucson, Arizona, USA.
- Rivera, P. 2012a. Copiapó y la no política de aguas. *El Mostrador*. 29 January 2012.
- Rivera, P. 2012b. Análisis de la sectorización del acuífero de Copiapó para la administración de derechos de agua de Econsa: Informe final. Unpublished document.
- Rogers, P. and Hall, A. 2003. *Effective water governance*. Global Water Partnership, Technical Background Paper. Stockholm: GWP.
- Sapag, R. 2009. Hierve el agua. *Capital* 255: 40-48, 26 June-9 July 2009.
- Saurí, D. and del Moral, L. 2001. Recent developments in Spanish water policy: Alternatives and conflict at the end of the hydraulic age. *Geoforum* 32(3): 351-362.
- Segura, P. 2014. Recuperando el sentido común sobre el agua, ese elemento vital. *El Dinamo* (accessed on 26 April 2014).
- Skoknic, F. 2009a. Se muere el río Copiapó (I): Consumo humano, agrícola y minero están en riesgo. [ciperchile.cl/2009/07/09/se-muere-el-rio-copiapo-i-consumo-humano-agricola-y-minero-estan-en-riesgo/](http://ciperchile.cl/2009/07/09/se-muere-el-rio-copiapo-i-consumo-humano-agricola-y-minero-estan-en-riesgo/) (9 July 2009)
- Skoknic, F. 2009b. Se muere el río Copiapó (II): Lluvia de fórmulas para salvarlo de la agonía. [ciperchile.cl/2009/07/15/el-rio-copiapo-se-muere-ii-lluvia-de-formulas-para-salvarlo-de-la-agonia/](http://ciperchile.cl/2009/07/15/el-rio-copiapo-se-muere-ii-lluvia-de-formulas-para-salvarlo-de-la-agonia/) (15 July 2009)
- Szigeti, C. 2013. *Reformas constitucionales en materia de aguas y reformas al Código de Aguas*. Documento de Trabajo. Santiago: Chile Sustentable.
- Tecklin, D. 2014. Environmental governance and the politics of property in Chile. PhD thesis. University of Arizona, Tucson, Arizona, USA.
- Tecklin, D.; Bauer, C. and Prieto, M. 2011. Making environmental law for the market: The emergence, character, and implications of Chile's environmental regime. *Environmental Politics* 20(6): 879-898.
- Urquieta, C. 2010. El cerebro detrás de las políticas del agua del gobierno de Piñera. *El Mostrador*, 26 May 2010.
- Valenzuela, C. 2009. *La patente por la no-utilización de las aguas en Chile: Origen, diseño y primeras experiencias en su implementación*. Documento de trabajo. Santiago: Comisión Económica para América Latina y el Caribe.
- Valenzuela, C.; Fuster, R. and León, A. 2013. Chile: ¿Es eficaz la patente por no uso de derechos de aguas? *Revista CEPAL* 109: 175-198. Santiago: CEPAL (Comisión Económica para América Latina y el Caribe).
- Vergara, A. 2012. *Focalizando la agenda de un recurso común: El desafío de potenciar la autogestión de las aguas en Chile*. Temas de la Agenda Pública No. 56. Santiago: Centro de Políticas Públicas, Universidad Católica de Chile.

- Vergara, A. 2014. *Crisis institucional del agua: Descripción del modelo, crítica a la burocracia y necesidad de tribunales especiales*. Santiago: Legal Publishing/Thomson Reuters.
- Vergara, A.; Donoso, G.; Rivera, D.; Moyano, V. and Blanco, E. 2013. Aguas y energía: Propuestas para su autogobierno y resolución especializada de conflictos. In *Propuestas para Chile*, pp. 241-270. Santiago: Universidad Católica de Chile.
- World Bank. 1993. *Water resources management: A World Bank policy paper*. Washington, DC: World Bank.
- World Bank. 2004. *Water resources sector strategy: Strategic directions for World Bank engagement*. Washington, DC: World Bank.
- World Bank. 2011. *Chile: Diagnóstico de la gestión de los recursos hídricos*. Washington, DC: World Bank.
- World Commission on Dams. 2000. *Dams and development: A new framework for decision-making*. London: Earthscan.
- Yañez, N. and Molina, R. 2011. *Las aguas indígenas en Chile*. Santiago: LOM Ediciones.

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