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Basin councils policy in Chile: An assessment of progress toward enhanced water resilience

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ABSTRACT

The year 2022 marked a pivotal moment for water governance in Chile, with significant regulatory reforms such as amendments to the Water Code— transition from water management based on control instruments to one based on economic instrument —the enactment of the Climate Change Framework Law (Law No. 21.455), and the introduction of the **Basin Councils public policy**, an unprecedent initiative for the country, aimed to strengthen adaptive governance for water resilience. These reforms emerged in the context of a prolonged megadrought that underscored the urgent need for improved coordination mechanisms and integrated strategies to address growing climate, environmental and social pressures. This study examined the implementation and progress of the Basin Councils policy, using the OECD Principles on Water Governance as an evaluative framework focused on characteristics that enhance resilience. By comparing the development of the policy from its inception to the present, the research explored how these councils incorporated adaptive governance practices to enhance institutional capacity and stakeholder collaboration. In less than two years, the halt in public policy progress revealed the substantial challenges it faced, including ambiguities in institutional responsibilities and limited stakeholder inclusion, reflecting the inherent difficulties of transforming deeply entrenched systems. By analyzing Chile's experience, the study contributes to a deeper understanding of how regulatory frameworks and institutional performance can evolve to address contemporary challenges. These insights offer valuable lessons for public policy design both nationally and in similar watershed contexts, highlighting the importance of embedding resilience in governance reforms to promote inclusive and sustainable practices.

1. Introduction

The evolution of Chile's water management system has been gradual, progressive, and challenging, driven by the aim of adopting a more integrated approach to water governance (Peña, 2018; Hearne and Donoso, 2005). Since the late 1990s, several initiatives have sought to advance Integrated Water Resources Management (IWRM) (Dourojeanni et al., 2010). Notable efforts include the development of Master and Strategic Plans at the basin level for river systems such as San José de Maipo (developed in 1998) and Aconcagua (in 1991), as well as proposals to establish new institutions, such as the Biobío River Basin Corporation (proposed in 1995). However, none of these initiatives were ultimately implemented, resulting in significant gaps in the effective adoption of IWRM at the basin level (Donoso, 2014) and to address the challenges of a changing climate (Clarvis and Allan, 2014).

In turn, a 14-year megadrought, with annual precipitation reductions of 30–40 % below historical averages (Garreaud et al., 2020) that affected the continental area from 30°-38°S, has uncovered the country's water vulnerability. High water stress indicators such as declining central aquifer reserves (Taucare et al., 2024), raised the imminent risk of a "day zero" scenario, involving potable water rationing in the Metropolitan Region, Chile's urban and political center where 7 million people live (Asociaciones de Canales y Aguas Andinas S.A, 2021; Center for Climate and Resilience Science (CR)², 2023). Moreover, water

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scarcity have severely impacted water access to rural communities, where reliance on water tanker trucks has become normalized (Fragkou et al., 2022; Nicolas-Artero and Blanco-Wells, 2025).

This context emphasized the urgency of enhancing basin adaptation to address the growing pressures of climate change (Barría et al., 2021b; Álamos et al., 2023). In response to these challenges, in 2022, Chile's newly elected self-proclaimed ecologist government assumed office, prioritizing environmental and water issues on its agenda. One of its first actions was establishing the Interministerial Committee for Just Water Transition (CITHJ, in Spanish) (Ministerio del Medio Ambiente, 2022a). Coordinated by the Ministry of the Environment (MMA, in Spanish)-and involving the Ministries of Public Works (MOP, in Spanish), Agriculture (MINAGRI, in Spanish), Energy, Science, and Mining-the CITHJ announced the establishment of pilot Basin Councils in each of the country's 16 administrative regions as a participatory governance model for integrated water management (MMA, 2022). Drawing from recommendations from international organizations (OECD & ECLAC, 2016; World Bank, 2021), Basin Councils public policy were conceptualized as public-private decentralized territorial bodies, aimed at reinforcing flexibility, multi-level collaboration, and stakeholder engagement to strengthen water governance operationalize resilience and adaptive governance by fostering institutional and procedural adaptability to climate change, through investment and water planning (MMA, 2022).

Resilience and adaptive governance are essential frameworks for addressing the complex issues faced by socio-ecological systems (SES) (Folke, et al., 2005). Resilience refers to the capacity of systems to absorb risks, impacts, or stresses while maintaining their essential functions and structures, allowing them to adapt and thrive in dynamic environments (Folke, 2016; Holling, 1973; Rodina, 2018). Adaptive governance, on the other hand, offers a flexible, learning-based approach for managing socio-ecological systems. By engaging multi-level actors, it aims at facilitating navigation through uncertainties, strengthens resilience, and promotes sustainability (Chaffin et al., 2014; Folke et al., 2005; Saikia and Jiménez, 2023).

Despite a growing consensus on the importance of resilience thinking, translating these conceptual frameworks into actionable public policies remains a significant challenge. This difficulty stems mainly from the complexities involved in operationalizing resilience within multi scale and often fragmented governance systems (Chaffin et al., 2016; Garmestani et al., 2019; Grafton et al., 2019). To address this gap, Biggs et al. (2012), drawing on an extensive review of the literature, proposed seven interrelated principles designed to enhance resilience in both ecosystem management and governance systems. Three of these principles pertain to ecosystem stewardship: (P1) maintaining diversity and redundancy, (P2) managing connectivity, and (P3) managing slow variables and feedback. The remaining four principles focus on governance dimensions essential for enhancing resilience: (P4) fostering an understanding of social-ecological systems as complex adaptive systems, (P5) encouraging learning and experimentation, (P6) broadening participation, and (P7) promoting polycentric governance.

These principles collectively underscore the importance of mechanisms such as decentralized decision-making, participatory approaches, and adaptive flexibility to effectively navigate the complexity of SES (Chaffin et al., 2014; Plummer et al., 2013; Rockström et al., 2014; Cumming et al., 2006), while addressing mismatches between social and ecological scales in governance (Chaffin et al., 2014; Plummer et al., 2013; Rockström et al., 2014). In view of the foregoing, new collaborative and adaptive governance approaches have been encouraged (Pahl-Wostl and Knieper, 2023; Hong et al., 2024; Pahl-Wostl, 2007; Koontz et al., 2015).

This perspective is particularly relevant in Chile, where systemic issues, such as the prolonged megadrought, highlight the urgency of adopting innovative and adaptive governance approaches (Crocco, 2021; Rivera et al., 2021; 2022; Rivera and Donoso, 2023). Acknowledging the challenges of implementing an innovative approach within a rigid water management system (Peña, 2018), the initiative's promoters underscored the need for formal regulatory recognition to ensure sustainable water governance, resulting in the commitment to present a proposed bill by the end of 2022 (Cámara de Diputadas y Diputados de Chile, 2022). However, after more than a year of implementation progress, concerns and opposition arose from various Water User Organizations (WUAs), questioning the legality and scope of the public policy. Since November 2023, the initiative has stalled as government efforts have shifted toward an alternative approach focused on development of watershed-scale strategic planning roundtables (MERH, in Spanish).

Despite these setbacks, the story of the Chilean Basin Councils public policy remains a compelling case for environmental policy analysis. This context highlights the tensions between ambitious water governance policy design and the practical realities of implementation.

To do that, this study evaluated the progress and challenges of these Basin Council pilots, using the OECD Water Governance Principles (OECD, 2015) and the Biggs et al. (2012) SES Resilience approach as analytical framework. These principles provide a structured and comprehensive approach to assess governance practices, focusing on aspects such as stakeholder engagement, multi-level coordination, and institutional coherence. They also offer a lens to explore how the concepts of resilience and adaptive governance are integrated into the design and implementation of public policies (Akhmouch and Clavreul, 2016; Jetoo, 2019; VanNijnatten and Johns, 2020). Despite their practicality and widespread application (OECD, 2018), these frameworks have faced criticism for their limited consideration of indigenous water rights (Taylor et al., 2019), insufficient clarity at the local scale (Keller and Hartmann, 2020), and the challenges they pose for implementation in transboundary and multilevel governance contexts (Johns, 2021).

2. Water context of Chile

2.1. Water scarcity context

Chile has experienced an unprecedented megadrought, with rainfall reductions of 20–40 % below historical averages (Boisier et al., 2016; Garreaud et al., 2020), alongside rising temperatures. This prolonged drought has severely strained water resources, affecting human consumption, agriculture, industry, and biodiversity (Aldunce, et al., 2017; Garreaud, et al., 2017; Rivera and Donoso, 2025).

Climate modeling studies have attributed at least 25 % of the megadrought's variability to climate change (Garreaud et al., 2020), emphasizing that drought and reduced rainfall are likely to persist (Salazar et al., 2023), further worsening water scarcity—defined as limited access to adequate water quality and quantity (Álamos et al., 2023; Barría et al., 2021b; Lagos-Zúñiga et al., 2024; White, 2014). Additionally, research has shown that overexploitation of water resources and poor watershed management have significantly intensified these drought conditions (Barría et al., 2021a; Rivera and Donoso, 2025).

To address drought periods, the State has implemented various tools, including Water Scarcity Decrees, which empower the General Directorate of Water (DGA, in Spanish) - the agency responsible for allocating the country's water resources and intervening in extreme situations (Rojas, 2016)-, to establish criteria and boundaries for water extraction authorizations. However, this reliance on temporary measures reflects a reactive approach to a now permanent drought condition, prioritizing immediate crises over long-term structural solutions (Rivera and Donoso, 2025). It also highlights the pressing need for sustainable policies that address root causes of the drought impacts and foster more resilience (Hurlbert and Díaz, 2013; Pérez-Silva and Castillo, 2023; Rivera and Donoso, 2025).

Additionally, Chile has experienced a rise in extreme weather events, with increasing daily rainfall extremes between 1970 and 2023 (Lagos-Zúñiga et al., 2024). These events strain water infrastructure, prompting emergency responses over long-term adaptation (Aldunce,

et al., 2024). For instance, in 2023, expenditures to mitigate the impacts of extreme events reached US$759 millions (Dirección de Presupuestos de Chile [DIPRES], 2023; Dirección de Presupuestos de Chile [DIPRES], 2024). Currently, significant investments to construct reservoirs and desalination plants have been discussed.[2] The efficient implementation of these initiatives demands strategic planning that incorporates the perspectives of key stakeholders within the watersheds (Rivera and Donoso, 2025).

2.2. Water policy context

Water governance in Chile has evolved from a simple colonial structure to a model characterized by centralized and decentralized institutions (Donoso, 2018; Vergara and Rivera, 2018, 2021). The largest changes occurred during the military dictatorship (1973–1990) when natural resources, especially water was turned into rights that could be traded as a marketable commodity, turning Chile in a worldwide leading example of free-market approaches (Bauer, 2009).

The neoliberal policies enshrined in the 1981 Water Code, reduced state intervention in water resources management and increased the autonomy of water right holders, organized into WUAs (Budds, 2004). Although these developments enhanced legal certainty for certain actors, particularly water right holders, it also led to management inefficiencies, overextraction and depletion of aquifer reserves due to overallocation, and the intensification of social conflicts. These tensions stem from structural power imbalances, and persistent social inequities, including the neglect of indigenous claims and environmental concerns (Donoso, 2012; Bauer, 2015; Sánchez Galvis et al., 2018).

The governance structure of the WUA is established in the Water Code. These organizations manage shared water resources—including rivers, canals, aquifers, and reservoirs—and operate as independent, decentralized bodies (Herrera et al., 2020; Retamal et al., 2012). They have traditionally played a significant role in shaping water policy debates in the country, adopting a conservative stance typically resistant to greater state regulation (Budds, 2004). Beyond the WUA, significant gaps remain in the formal interaction of the State, water rights holders, civil society, and representatives from diverse sectors and basin uses, hindering integrated and adaptive management (Budds and O'Reilly, 2023).

However, as described below, several institutional transformations in Chile over the past decade, represented opportunities and obstacles for implementing reforms like the Basin Councils's public policy:

- Constitutional processes in 2022 and 2023, both rejected. The 2022 proposal, drafted by a democratically elected Constitutional Convention, introduced a comprehensive Water Statute (Rivera, et al., 2022; Torres-Salinas and Alvez Marín, 2023). This included provisions for a National Water Agency (ANA, in Spanish), decentralized watershed-level governance and recognition of water and sanitation rights (Constitutional Convention, 2022). Later, a different process was initiated in 2023, which also emphasized water security, sustainability, and multifunctionality (Consejo Constitucional, 2023). Although none of the process were finalized, both highlighted a consensus on constitutionalizing some aspects of water regulation and the need for legal innovation in water governance (Rivera et al., 2022, 2023; Irarrázaval et al., 2023).
- The election of regional governors in 2021 marked a significant step forward in Chile's decentralization, alongside the transfer of competencies to regional authorities (Montecinos, 2023). Within the framework of this decentralization process, Regional Governments have updated their Regional Development Strategies (ERD, in Spanish), key to territorial planning, now reflect increasing regional interest in water management, incorporating goals for water security, sanitation, and efficiency.
- Legal Reforms and Initiatives in Water Management: Chile has adopted a robust framework aligned with the United Nations 2030 Agenda, specifically committing to Sustainable Development Goal (SDG) 6. The following key laws stand out:

- Law N° 21,435, Water Code Reform (Gobierno de Chile, 2022a): This reform marks the most significant modification to the Water Code since 1981. It moves towards a framework that emphasizes the public nature of water and the public interest that should govern its management. The main changes include: i) reaffirmation of the public nature of waters, and orientation to the function of satisfying the public interest, ii) recognition of water multiple functionalities, iii) water reserves and reallocations, to ensure the exercise of subsistence and ecosystemic preservation functions, iii) limitations to new water concessions to 30 years, iv) the reduction or limitation of the exercise in case of negative impacts, and v) causes for the administrative extinction of water rights (Boettiger and Crocco, 2022; Rojas, 2024; Celume, 2024). It also mandates the development of Strategic Water Resources Plans in Basins (PERHc, in Spanish) for the 101 basins of the country, which seeks water security, and to propose a set of actions and investments to address the adverse effects of climate change on water resources.
- Law No. 21,455, Framework Law on Climate Change (Gobierno de Chile, 2022b): establishes water security as vital for climate adaptation, mandating -among several measures-, the establishment of strategic plans at the basin level to adapt to climate change.
- Law No. 18,450 (Gobierno de Chile, 2023a): aims to promote sustainable rural development, and as an innovative feature, integrates Nature-Based Solutions (NbS) into the portfolio of initiatives eligible for irrigation sector funding. Article 1 declared that subsidies aim to contribute to water security, to sustainable and equitable rural and territorial development and to ecosystem conservation, framed under basin management frameworks in force (in coherence with water policy reforms ongoing during the period of updating and parliament discussion).
- Law No. 20,998 (Gobierno de Chile, 2023b): strengthens rural sanitation services (SDG 6, Goals 6.1 and 6.2), aims to address deficiencies identified in program evaluation processes and encourages associativity through regional advisory councils.
- Supreme Decree No. 209, Escazú Agreement (Gobierno de Chile, 2022c): integrates the "Regional Agreement on Access to Information, Public Participation, and Justice in Environmental Matters in Latin America and the Caribbean" into Chile's legal framework. Although water is not explicitly mentioned, the agreement's objectives—enhancing information systems, promoting public participation, and ensuring justice in environmental matters—are closely aligned with SDG Targets 6.A and 6.B, which focus on strengthening water-related capacities and community participation in water management.
- Law No. 21,600 (Gobierno de Chile, 2022c) that Establishes the Biodiversity and Protected Areas Service and the National System of Protected Areas: promotes the elaboration and implementation of restoration, management, and conservation of ecosystems plans, with a watershed approach.
- Finally, although is not a recent reform, the Law 19.300, Article 2°, letter ñ), introduced the Secondary Environmental Quality Standards (NSCA) which establishes permissible values for the water quality, promoting environmental protection and preservation of nature. They consider the specific characteristics of each watershed.

Although not all proposed reforms were enacted due to complex factors beyond the scope of this analysis, such as the constitutional process, the policies implemented reflect a clear commitment to a multidimensional approach to water management. These policies aim to

[2] Retrieved from the minutes of sessions No. 258 and 262 of the CNR Council of Ministers.

integrate ecological, social, and productive considerations, with a strong emphasis on sustainability and alignment with the objectives of Sustainable Development Goal 6. However, challenges remain in harmonizing regulatory frameworks for cohesive governance, as illustrated in Fig. 1.

2.3. Basin councils' public policy

Over the years, Chile has implemented diverse water governance initiatives, such as roundtables and dialogue spaces (Fig. 2). Studies on these experiences reveals a lack of continuity and effective coordination, along with critical gaps, including insufficient funding, weak public institutions, non-binding decisions, and lack of legal recognition, leaving these initiatives without institutional standing or integration into broader governance systems (Bauer, 2015; Dourojeanni et al., 2010; Meza and McPhee, 2011; Peña, 2018; Soto Bruna, 2019).

Building on this history, the pilot Basin Councils were designed as intersectoral and territorially relevant governance models, aimed at defining a strategic vision for each basin, identifying water management gaps, and ensuring sustainable resource use. They were originally conceived as organizations to support the development and implementation of the Strategic Water Resources Plan (PERHc) while fostering coordination among government agencies, water users, indigenous communities, and civil society. Their objectives also included reducing conflicts, promoting agreements, and ensuring equitable water distribution. Additionally, they served as a foundation for future legislation, ensuring their long-term institutionalization within Chile's legal framework MMA, (2022). As seen in Fig. 3, the pilot Basin Councils were designed with a structure comprising three bodies: a governing board, a technical secretariat, and a tripartite plenary.

Interministerial technical teams (UTMZ, in Spanish), composed of professionals from the Ministries of Environment, Agriculture and Public Works, were established to coordinate diagnoses with regional authorities and stakeholders, and facilitate pilot implementation across macrozones (MMA, 2023a).

During 2022, The CITHJ authorities met with the teams of the Regional Governors, coordinated through the Association of Regional Governors of Chile (AGORECHI, in Spanish), to design the structure of the pilot basin organizations. Between April and July of that year, expanded and macro-regional meetings were held to co-create pilot Basin Councils. Between September and December, all the Regional Governments selected their pilot basin (Appendix 1). Subsequently, from January to November 2023, coordination meetings were held in all 16 regions with regional authorities, including governors and ministry representatives, to align public policy development. By September 2023, regional promoter groups (GP, in Spanish) were established in seven basins located in seven regions (see Appendix 2), as collaborative workspace to gather perspectives and experiences from key water management stakeholders, fostering participation in the future pilot basin councils (MMA, 2022b). However, progress stalled, and the pilot Basin Councils were discontinued before having a regulation, law or rule to define them, without clear explanations from CITHJ authorities. Instead, in the context of the PERHc elaboration, the government shifted focus to implement "strategic water resources roundtables" (MERH, in Spanish), a new governance initiative supported by the Law 21,435. Given this scenario, it is interesting to explore how these initiatives align with the Basin Councilsʹpublic policy and to assess the progress made in terms of governance for water resilience in the country.

3. Method

This study presents an exploratory qualitative analysis of the Basin Councils public policy implemented in Chile as a governance model to enhance water resilience, using it as a case study. Case studies are a suitable methodological strategy for public policy analysis (Knieper et al., 2010) as they allow for the exploration of complex phenomena deeply embedded in their context, providing a comprehensive and contextualized perspective. Within this framework, qualitative case studies stand out for their capacity to analyze social dynamics, evaluate decisions, and understand how and why public policies succeed or face

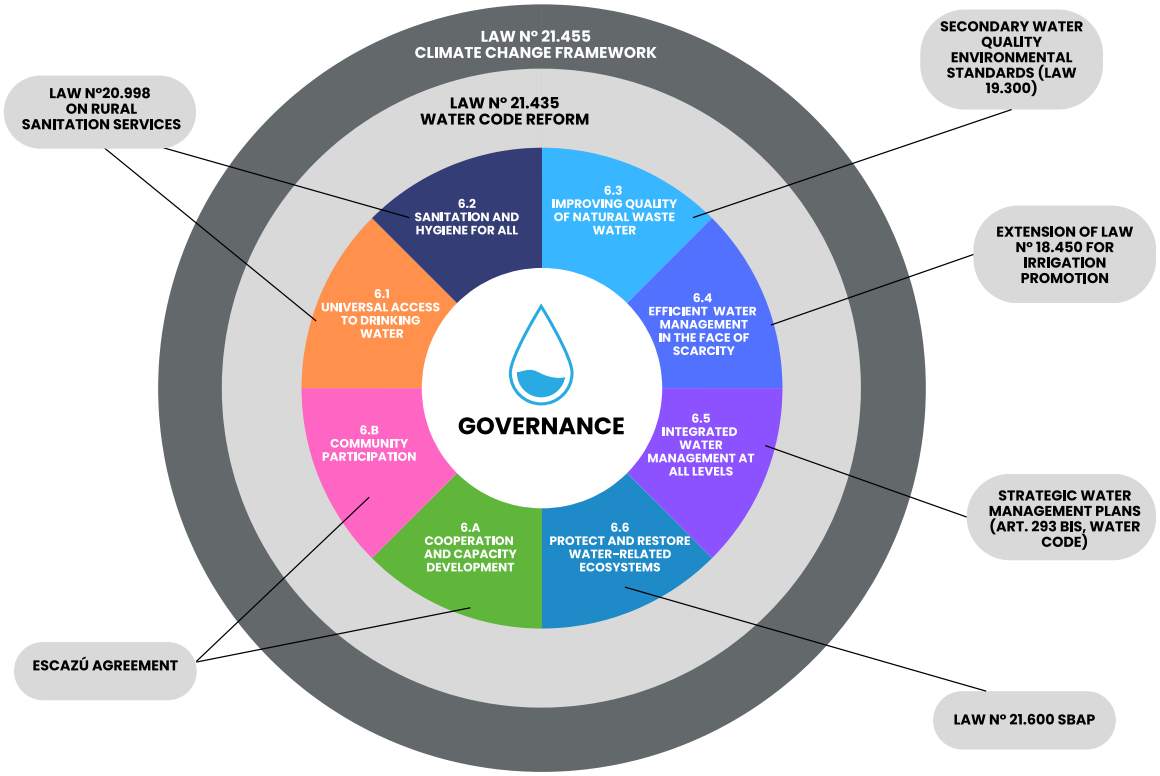


Fig. 1. Regulatory Framework for water governance in Chile. Source: Author's elaboration based on SDG Agenda (United Nations, 2015).

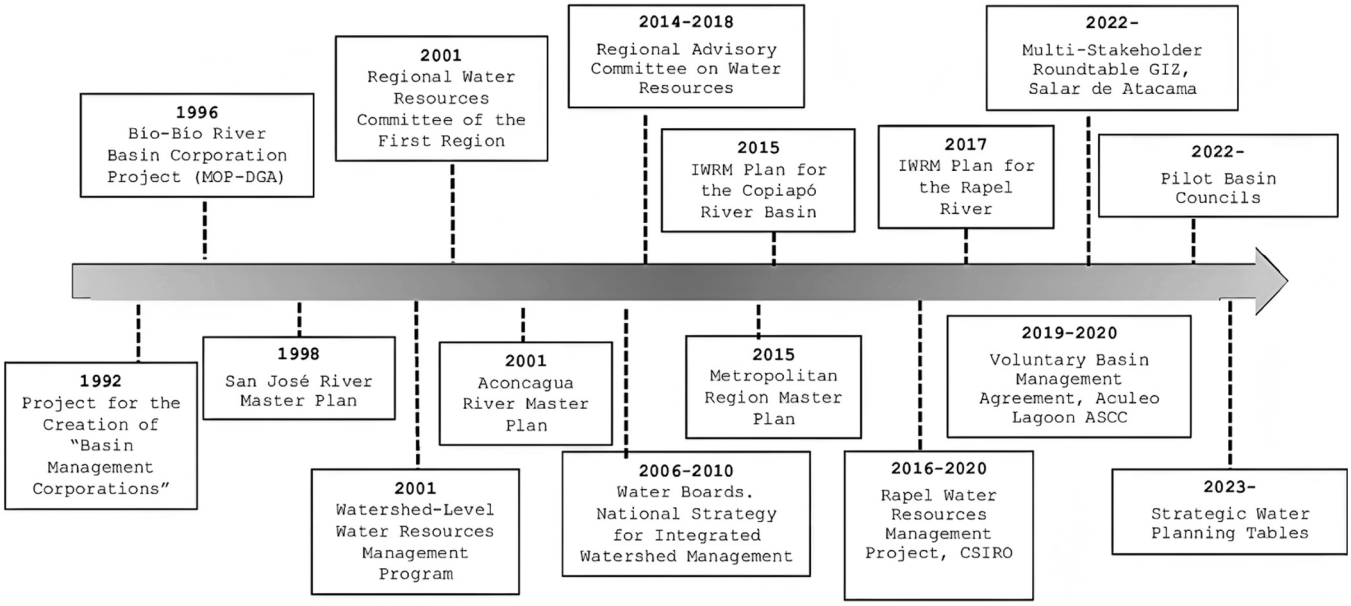


Fig. 2. Examples of local water governance initiatives launched in Chile since year 1992. Source: Author's elaboration.

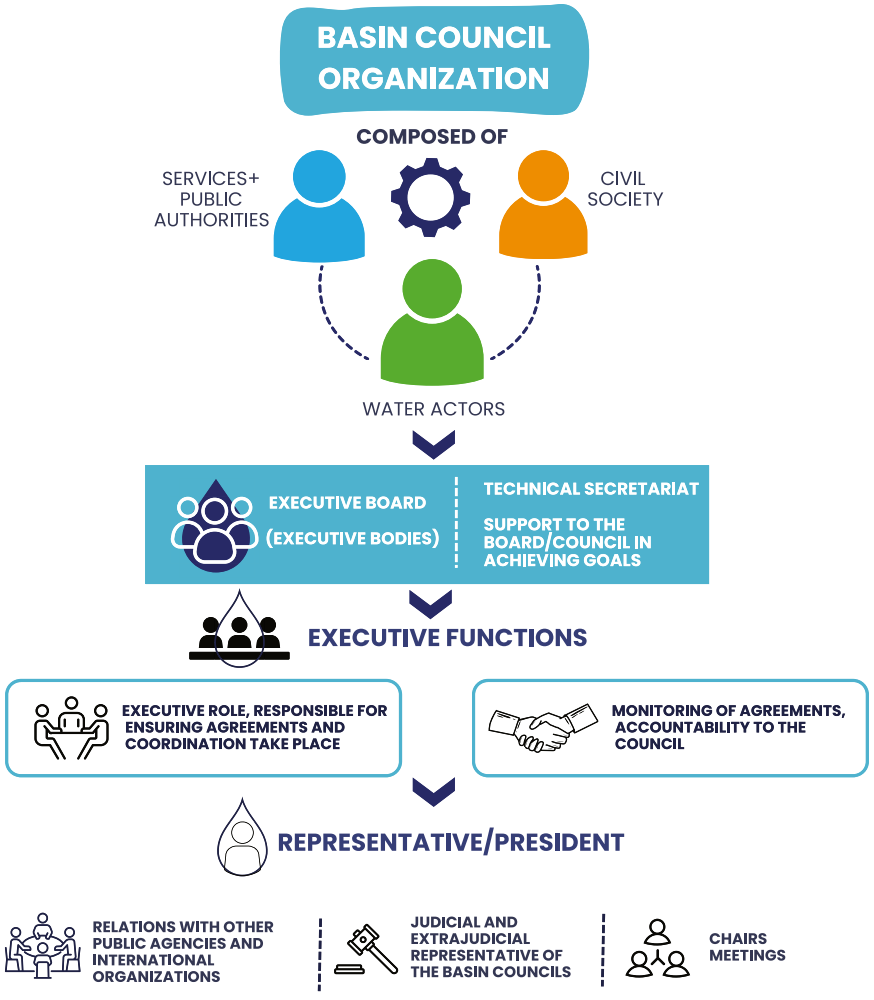


Fig. 3. Structure of the Pilot Basin Councils launched in Chile during year 2022. Source: Author's elaboration based on MMA (2022b).

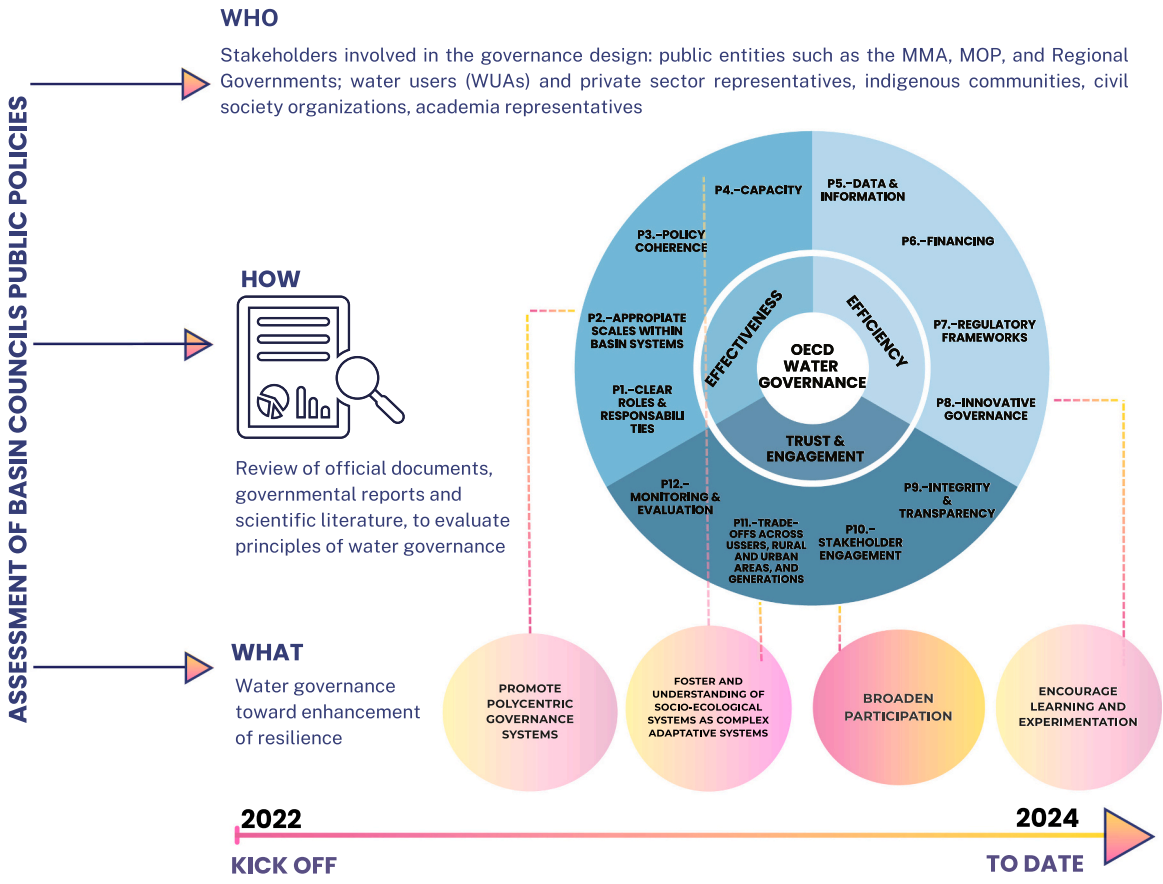


Fig. 4. Methodological Framework for assessing the implementation of Pilot Basin Councils through water governance and socio-ecological resilience principles. Source: Author's elaboration, based on OECD (2015) and Biggs et al. (2012).

obstacles (Yin, 2003).

As presented in Fig. 4, and to guide the analysis, we integrated two complementary frameworks: the OECD Principles on Water Governance and the socio-ecological resilience framework proposed by Biggs et al. (2012). The OECD's 12 principles provide a structured approach for evaluating water governance, covering core elements such as the governance context (what), policy instruments (how), responsible institutions (who), and areas for improvement over time. These principles span the full water policy cycle and aim to promote governance that is effective, efficient, and inclusive, three essential dimensions for building resilience in water systems (OECD, 2022; Akhmouch et al., 2017).

In parallel, the framework developed by Biggs et al. (2012) outlines seven principles for fostering resilience in socio-ecological systems. Four of these principles relate to the attributes of governance systems (presented in Fig. 4), while the remaining three focus on the biophysical and social features of the systems being managed. The Table in the Appendix 3 presents the alignment between these two frameworks, along with definitions for each principle.

The evaluation of progress and challenges in the implementation of this public policy was carried out in two stages: the beginning of the initiative in 2022 (Moment 1), and two years into its inception, in December 2024 (Moment 2). This temporal comparison enabled the identification of both progress and setbacks, detailed in Tables 1, 2, and 3. Data collection included an exhaustive review of official and governmental documents, public policy reports, and relevant scientific literature. These materials were analyzed through an integrated conceptual lens combining resilience and adaptive governance principles, allowing for a contextualized and chronological evaluation of the policy's evolution. Although not a systematic review, this approach offers a critical and applied synthesis that contributes to the understanding and improvement of water governance in Chile, providing guidance for future water policy design.

4. Analysis of progress and setbacks in the process

Regarding the "what" dimension of the methodology, as outlined in Chapter 3, the Chilean context in 2022 provided a pivotal foundation for the design and implementation of a Basin Council policy. The enactment of the Climate Change Framework Law (Gobierno de Chile, 2022b) established a legal framework focused on addressing climate change challenges, promoting resilience, and enhancing governance mechanisms. This legislative progress, combined with the growing need to address water resource vulnerabilities during a prolonged megadrought, created the conditions necessary for initiating a policy aimed at improving water governance through participatory and adaptive approaches. Moreover, recommendations from international organizations, such as the OECD (2015) and the World Bank (2013), emphasized the importance of fostering integrated water resources management and participatory governance at the basin level. Alongside these developments, other legislative reforms contributed to creating a supportive regulatory environment for advancing water governance initiatives.

According to the World Bank (2013), a diverse array of stakeholders is involved in the water institutional framework, including public entities such as the MMA, MOP, and Regional Governments, as well as Water Users Organizations (WUO). In total, at least 43 public, private and autonomous entities have functions associated with water management in Chile (World Bank, 2013). However, Indigenous communities, civil society organizations, the private sector, and academic institutions remain insufficiently integrated into the institutional

Table 1
Evaluation of Basin Council Policy under the OECD Water Governance Principles. Effectiveness.

Principle	Moment 1 Beginnings of the initiative (2022)	Moment 2 (2024)
P1	**Decree No. 58** (MMA, 2022a). Creation of the CITHJ for coordination of public services. Draft Water Statute under the constitutional process (Section 2.2) **Law N°21,435** (Gobierno de Chile, 2022a). Reforms to the Water Code have expanded the DGA's regulatory and planning functions. **Law No. 21,455 (**Gobierno de Chile, 2022b). Establishes water as a key pillar of climate change adaptation and promotes basin-level planning Commitment at the 2023 UN Water Conference to implement 10 basin council pilots (MOP & MMA, 2023). Commitment by the MMA to drafting a bill for the establishment of Basin Councils (Comisión de Recursos Hídricos y Desertificación, 2022).	**Bulletin N°16832-07,** which proposed the creation of the Sub-Secretariat of Water Resources (as National Water Authority), has not shown any progress from the executive branch[1] Proposals for a constitution that included a national water authority were rejected (Section 2.2) **Official Letter N°243307** (MMA, 2024a). Executive working on the design of a draft bill for Basin Councils, led by MOP and coordinated with other ministries, including MMA. No legislative progress recorded[2]. **Regarding the Strategic Water Resources Roundtables- MERH:** **Official Letter N°235770** (MMA, 2023c). Confusion stems from overlapping functions and unclear coordination between basin councils and strategic roundtables- MERH.
P2	**Official Letter N° 234058 (MMA, 2023d).** The beginnings of basin councils' pilots in 7 regions. Regional Governors joined the councils's initiative (Appendix 1). Progress in decentralization, election of regional governors, and integration of water-related objectives into ERDA´s (not showed).	**Office Letter N° 243307** (MMA, 2024a). Last meeting of basin councils held in November 2023. Initiative stopped since. **Regarding the Strategic Water Resources Roundtables-MERH:** **Supreme Decree N°58 (**MOP, 2024a). Regulation for Strategic Water Resource Plans (PERHc) was approved. Implementation of Strategic Water Resources roundtables-MERH in 7 basins[3].
P3	**Supreme Decree No. 209** (Gobierno de Chile, 2022c) . Ratification of the Escazú Agreement. Incentive for participation (core principle of basin councils' public policy). **Update of Law No. 20,998** (Gobierno de Chile, 2023b). Strengthens the associativity of rural sector actors, promotes integrated water management, and ensures equitable access to sanitation services (art. 4, 11 and 24).	**Exempt Resolution No.1,588** (MOP, 2024c). Climate Change Adaptation Plan for Water Resources (PACC-RH, in Spanish) approved, aims to enhance water resilience against climate change impacts. **Exempt Resolution No. 2,256** (MMA, 2024c), which approves the National Participatory Implementation Plan for the Escazú Agreement Chile 2024-2030, does not establish connection to the Basin Councils Policy or water governance. Cancellation of CNR tenders[4] oriented to support the partnerships of stakeholders.
P4	Formation of **inter-ministerial UTMZ,** technical team to support the basin Councils's conformation (chapter 2.3).	Dissolution of **inter-ministerial UTMZ.**

[a]No significant legislative actions have been taken since its introduction. Retrieved from https://tramitacion.senado.cl/appsenado/templates/tramitacion/#
[b]Information obtained from the Chilean Chamber of Deputies' legislative database (https://www.camara.cl/legislacion/ProyectosDeLey/proyectos_ley.aspx), accessed in February 2025.
[c]Information extracted from the minutes of the Strategic Water Resources Committees for the Codpa-Vitor, Seno Andrew, Aysén, Choapa, Valdivia River, Maullín River, and Huasco River basins. Retrieved from https://dga.mop.gob.cl/paginas/mesas-estrategicas-recursos-hidricos.aspx.
[d]Examples: Tender ID 870-17-LR23 and ID 870-16-LR23, Transfer Programs to Strengthen AFC in Sustainable Practices, both approved with favorable RS status and later revoked by the service.
Gobierno de Chile (2023c). Informe Nacional Voluntario 2023: Avances y desafíos en los Objetivos de Desarrollo Sostenible. Gobierno de Chile. Retrieved from ⟨https://www.chileagenda2030.gob.cl/recursos/1/documento/Informe_Voluntario_Cons-03_Junio2023.pdf⟩. MMA . (2023c). Oficio N.º 235770: Emite informe según lo indicado. Retrieved from https://www.camara.cl/verDoc.aspx?prmID=298000&prmTIPO=DOCUMENTO_COMISION. MMA . (2023d, 22 de septiembre). Oficio N°234058: Evacúa informe que indica. Ministerio del Medio Ambiente, Gobierno de Chile. Unpublished document. MOP (2024c). Resolución Exenta N.º 1.588: Aprueba el anteproyecto del Plan Sectorial de Adaptación al Cambio Climático de los Recursos Hídricos. Retrieved from https://www.bcn.cl/leychile/navegar?idNorma=1204140. MOP (2024d). Decreto Supremo N.º 51: Aprueba el reglamento para iniciativas financiadas por el Fondo de Investigación, Innovación y Educación en Recursos Hídricos, establecido en el artículo 293 ter del Código de Aguas. Diario Oficial de la República de Chile. Retrieved from https://www.bcn.cl/leychile/

Navegar?idNorma=1199915. MOP & MMA . (2023). Strengthening Integrated Water Resources Management in Chile. Retrieved from https://sdgs.un.org/partnerships/strengthening-integrated-water-resources-management-chile.

Table 2
Evaluation of the 2022 Basin Council Policy under the OECD Water Governance Principles. Efficiency.

Principle	Moment 1 Beginnings of the initiative (2022)	Moment 2 (2024)
P5	An information platform was created to report the basin council's public policy progress[5]. However, basin-level diagnostics for water security and advances developed by the UTMZ teams, are not publicly available.	Deactivation of the dedicated website to disseminate the advances of the basin council's public policy in September 2023. Limited access to key information. Formal requests for information from the Chilean Congress regarding the progress and status of the Pilot Basin Councils, highlighting concerns about transparency and access to information (Cámara de Diputadas y Diputados de Chile, 2023a; Cámara de Diputadas y Diputados de Chile, 2024; Senado de Chile, 2023). **Regarding the Strategic Water Roundtables- MERH:** Commitment to report progress on PERHc in the basins (MOP, 2024a).
P6	**2023 Budget Law (Ministerio de Hacienda, 2022)** allocated specific funds for water infrastructure projects (MOP), irrigation modernization (MINAGRI), watershed conservation, and climate change policies in water management (MMA). The MMA lacks budgetary allocations for implementing the basin council (MMA, 2024b). Financing opportunities through the Sustainable Productive Development Program (lithium): climate resilience line[6].	MMA Budget Law (2024b) lacks funding for UTMZs or basin councils, and cancelled governance workshops led to underutilized funds, hindering implementation[7]. **Regarding the Strategic Water Roundtables- MERH:** World Bank support for Chile's water transition: In June 2024, a $250 million project was approved to advance a just water transition in the country (World Bank, 2023).
P7	Recognition of water's multifunctionality through **Law N° 21.435** (Gobierno de Chile, 2022a) and Law 21.455 (Gobierno de Chile, 2022b), complemented by additional regulatory advancements (Figure 1). The Basin Councils pilot initiative lacks a regulatory bill to provide formal support and oversight.	No legislative action has been taken regarding the draft bill for Basin Councils.
P8	Pilot approach in selected basins to test the participatory model to co-create the development of a legal framework for the Basin Councils Policy (chapter 2.3).	**Official Letter No. 243307** (MMA, 2024b). Discontinuation of the pilot basin councils and the innovative cocreation model. **Regarding the Strategic Water Roundtables- MERH:** **Decree 51 (MOP, 2024d).** Approves regulations for initiatives funded by the water resources research, Innovation, and Education established under Art. 293ter of Water Code. Water Roundtables.

[a]The platform created was http://agua.mma.gob.cl/, which has been inactive since September 2023.
[b]DPS Program (2023). Information available online at: https://programadps.gob.cl.
[c]Retrieved from <https://www.mercadopublico.cl/Procurement/Modules/RFB/DetailsAcquisition.aspx?qs=brODy47XAsb4Mo6RDhMp7w= =>
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framework ("who").

In this regard, at least at the discursive level, the original design of the Basin Councils' public policy aimed to incorporate stakeholders who have historically been absent or unrecognized in water governance (MMA, 2022c).

Regarding the "how" dimension of the methodology, the following tables present a chronological comparison of key milestones and developments in the implementation of the watershed council policy from its inception in 2022 to its current state in December 2024. Using the 12 OECD Principles on Water Governance presented in Fig. 4, grouped in effectiveness, efficiency and trust & engagement, the tables document legislative actions, institutional measures, and other significant events that have shaped the policy. These milestones reflect both progress and setbacks, offering a foundation for the subsequent analysis of governance practices and their outcomes.

Table 3
Evaluation of the 2022 Basin Council Policy under the OECD Water Governance Principles. Trust and Engagement.

Principle	Moment 1 Beginnings of the initiative (2022)	Moment 2 (2024)
P9	The Basin Councils pilot program was launched (MMA, 2022b) with a general structure of the organization and its objectives (Figure 3). However, it lacked clear definitions regarding integration rules and participation mechanisms, limiting its potential effectiveness.	**Request for resolution N°1119 (**Cámara de Diputadas y Diputados de Chile, 2023b). 24 WUO question the legality of the basin councils. **Official Letter No. 243307** (MMA, 2024a) Discontinuation of the pilot basin councils and the innovative cocreation model. **Regarding the Strategic Water Roundtables- MERH:** **Exempt Resolution 333** (MOP, 2024e) for Water Roundtables. It establishes that the selection and invitation of stakeholders to the meetings is the responsibility of the DGA, with discretionary authority.
P10	Advances in engagement of public and private stakeholders in seven pilots of basin councils (chapter 2.3 and Figure of the Appendix 2). However, the lack of integration rules, reduces the effectivity of representation.	No further advances in basins councils. **Regarding the Strategic Water Roundtables- MERH:** **Implementation of Exempt Resolution 333** (MOP, 2024e). Unclear roles in strategic planning. The roles and mechanisms to guarantee participation of WUOs and indigenous communities remain undefined in the development and implementation processes.
P11	Identification of water use priorities in the Water Code Reform (*Article 5 bis* of Law N°21,435; Gobierno de Chile, 2022a): human consumption and domestic subsistence use, sustainability of ecosystems and agricultural and domestic activities.	Government initiatives have shifted focus toward infrastructure projects[8], diminishing commitments to equity and excluding rural users and future generations.
P12	Absence of monitoring mechanisms integrated into the design of the Pilot Basin Councils.	**Ruling E428364N23 (Contraloría General de la República, 2023).** Comptroller General's Office validated pilot basin councils' legality in response to claims by WUOs questioning the legality of pilot basin councils.

[a]Retrieved from the minutes of sessions No. 258 and 262 of the CNR Council of Ministers.

4.1. Analysis of the basin councils public policy implementation effectiveness

4.1.1. Initial context and early promise (effectiveness principles of water governance)

Table 1 highlights that at the launch of the Basin Councils's public policy (Moment 1) the Chilean water governance context was favorable for advancing the four OECD principles related to effectiveness. The initiative was introduced within the context of an ongoing constitutional reform, during which the creation of a national water authority and a basin-level governance system were proposed (Rivera et al., 2022). Although there was no consensus regarding the roles and functions of these authorities, all proposals converged on the need to establish a more coordinated institutional framework to enable long-term water resource planning, reflecting progress toward Principle 1 (Clear roles and responsibilities) (Donoso, 2022).

The implementation of pilot Basin Councils aligned with Principle 2 (Appropriate scale within basin systems), as they were promoted jointly by the central government and Regional Governors within a broader decentralization agenda (Montecinos, 2023). This represented a step forward in fostering resilience by promoting polycentric governance—an approach that integrates interactions across different territorial and administrative levels (Biggs et al., 2012; see Fig. 4). The government's commitment to institutionalizing these councils was evident in its intention to introduce supporting legislation.

Additionally, legal instruments such as Supreme Decree No. 209 and the amendment of Law No. 20,998 were key in enhancing public participation in water and environmental policymaking, contributing to Principle 3 (Policy coherence).

With respect to Principle 4 (Capacity), efforts were made to establish macro-regional technical units (UTMZ) to support the pilot implementation. Although modest, these interministerial teams aimed to develop technical capacity while also promoting a more integrated understanding of water governance challenges. Their design reflected an acknowledgment of water as part of a complex, adaptive socio-ecological system, -supporting learning and cross-sector collaboration essential for resilience (Biggs et al., 2012).

4.1.2. Setbacks in effectiveness

However, two years into the initiative, significant setbacks emerged despite a favorable normative context established by the Climate Change Framework Law (Gobierno de Chile, 2022b) and reforms to the Water Code (Gobierno de Chile, 2022a). These legal frameworks provided a foundation for enhancing resilience by promoting long-term adaptation and integrated water management, aiming to improve coordination and clarify roles among a broader range of stakeholders (Principle 1). However, the opposition expressed by actors such as the Cámara de Diputadas y Diputados de Chile, (2023b) and the objection that led to the Comptroller's Ruling No. E428364N23 (Contraloría General de la República, 2023a) indicates that, despite ongoing critiques of the water market system, it remains deeply embedded in the institutional culture of water user organizations in Chile. Moreover, it is closely linked to broader ideological debates regarding the state's role in water governance. As such, its reform would have required a carefully designed and contextually sensitive implementation strategy. The inability to achieve consensus on constitutional reforms aligned with national realities,

along with the failure to establish the proposed Sub-Secretariat of Water Resources, represents a setback in clarifying institutional roles—undermining Principle 1.

Further regression was evident in Principle 2 (Appropriate Scales and Multi-Level Governance), as the pilot Basin Councils abruptly ceased operations at the end of year 2023 without explanation or communication from national authorities. This interruption weakened the policy's potential to consolidate governance structures across multiple scales and stakeholder levels—an essential condition for resilience-building.

Despite the objectives set out in Article 1 of the reformed Irrigation Law (Law No. 18,450), the unexpected cancellation of two public tenders by the National Irrigation Commission[3]- both aimed at strengthening the participation and management capacities of Indigenous communities and smallholder family farmers, and without any official explanation- represented a setback in terms of policy coherence (P3).

In addition, the launch of a new governance initiative under the Water Directorate (MERH) at the end of the year 2023, without clarity on the continuity of the Basin Councils policy, further undermined Principle 3.

At the beginning of 2024, Decree N°58 (MOP, 2024a) was published, establishing the legal framework and regulations for the PERHc, as well as the creation and functions of the MERH. Although this initiative could have represented progress in terms of planning, role clarity, and institutional coherence, its contents introduced several problematic elements:

a) The PERHC's scope was restricted to local-level climate change management, deviating from its intended purpose under the Water Code, which emphasizes water security in the context of climate change and other factors.

b) The regulation exceeded its legal mandate by introducing additional principles, definitions, and organic structures (Rojas, 2024). This departure from established hydrological planning frameworks reduced the initiative to a bureaucratic mechanism for generating plans, rather than achieving the integrated water resource management necessary for water security.

Finally, the dissolution of the UTMZ represented a major setback for advancing effective governance and socio-ecological resilience. This decision undermined the technical capacities required for implementation, particularly those associated with Principle 4, which highlights the importance of understanding and managing water as part of a complex, adaptive system. The elimination of the UTMZ marked a regression in efforts to build resilience through adaptive, cross-sectoral approaches.

4.2. Efficiency principles

As shown in Table 2, the early phase of the policy (Moment 1) revealed notable weaknesses in efficiency that were further exacerbated by Moment 2. The absence of a formal legal framework for the implementation of the pilot Basin Councils (Principle 7), inadequate budget allocations (Principle 6), and limited communication channels (Principle 5) hindered the initiative's dissemination and establishment.

By Moment 2, efficiency further deteriorated, particularly in terms of transparency (Principle 5). A major setback in transparency was the deactivation of the official website that provided updates on the Basin Council's policy in September 2023, limiting public access to key information and undermining accountability. Furthermore, this issue was compounded by the lack of proactive disclosure from public institutions regarding the initiative's progress. As noted in Table 2, official requests for information submitted to public agencies further illustrate this gap, as they sought formal responses on the policy's development and implementation status, highlighting the absence of a clear and systematic approach to information dissemination (Principle 5). This failure to ensure transparent communication contradicts commitments under the Escazú Agreement and weakens public trust in the governance process.

4.3. Sustainable financing and institutional progress

Sustainable financing (Principle 6) faced significant challenges, with insufficient fundings to support the installation of the basin councils (MMA, 2024b) and the dismantling of technical capacities to pursue their objectives (e.g., UTMZ). The Basin Councils Bill was never drafted, and pilot projects were terminated (MMA, 2024a) without formal communication to participants (Principle 8).

Alternative, progress was observed in the new initiative ruled by the DGA (MERH). Although the approval of a World Bank program in 2024 (World Bank, 2023) secured essential resources for transition to water security (Principle 6), it does not explicitly establish the requirement to formalize organisms to water governance.

Overall, the abrupt discontinuation of the basin council initiative was a regression toward socioecological resilience. It curtailed the learning and experimentation processes that are fundamental for managing uncertainty in complex systems (Biggs et al., 2012).

4.4. Trust and engagement

As presented in Table 3, the Basin Councils pilots began at Moment 1 without clear integration rules, participation mechanisms (undermining Principle 9), or monitoring and evaluation procedures (Principle 12), limiting the capacity to build trust and sustain engagement of stakeholders. While Principle 10 (stakeholder engagement) was initially present, with multi-level stakeholders participating in decentralized frameworks (Figure of Appendix 2), the absence of formal statutes and institutional guarantees (Principle 9) limited sustained involvement, particularly from water user organizations who by Moment 2 questioned the legality and refused to participate (Hertz, 2024; Vallejos and Acevedo, 2024).

It is also important to recognize that this mistrust is rooted in deeper structural factors, particularly the political and ideological legacy of Chile's neoliberal water market model and the concentration of economic power associated with water rights ownership. Together, these elements have historically posed significant obstacles to meaningful reform (Prieto et al., 2020; Budds, 2004).

The situation was further aggravated by Exempt Resolution No. 333 (MOP, 2024e), which established a state-dominated structure for the new MERH initiative. This re-centralization marginalized entities such as river surveillance boards and relegated WUOs to peripheral roles. Moreover, the participation of Indigenous communities and other key actors lacking legal personality remains unclear, reflecting bureaucratic constraints disconnected from the territorial realities and diverse organizational forms across basins. These shortcomings further undermined the resilience of the socio-ecological system (SES) by failing to foster social capital, link stakeholder action to ecological processes, or promote collaborative problem-solving—core dimensions of the "broaden participation" principle in resilience frameworks (Biggs et al., 2012).

4.5. Shift toward reactive infrastructure projects to the detriment of water governance and planning investments

In parallel, public investment shifted toward infrastructure projects, such as reservoirs and desalination plants, in response to the floods and wildfires that affected Chile during 2023 (Bozkurt et al., 2024). This pivot emphasized reactive crisis management over long-term, participatory, and adaptive water governance, underscoring the governance weakness regarding Policy Coherence (P3) and compromised Principle 11 (Trade-offs Across Time and Generations).

By favoring short-term crisis responses over sustainable water

[3] Examples: Tender ID 870–17-LR23 and ID 870–16-LR23, Transfer Programs to Strengthen AFC in Sustainable Practices, both approved with favorable RS status and later revoked by the service.

governance, these decisions increased future dependencies on costly infrastructure,[4] thereby reducing the flexibility needed for adaptive solutions. They also reflect persistent coordination challenges among government entities, further hindering inclusive and sustainable water governance. This trajectory marks a departure from governance approaches that recognize water systems as complex adaptive socio-ecological systems, thus eroding the foundations for resilience (Biggs et al., 2012).

5. Discussion and conclusions

This study has critically examined Chile's Basin Councils policy—an initiative intended to establish a participatory and adaptive governance framework at the basin scale to strengthen water resilience. Analyzing its implementation from 2022 to 2024 through the combined lens of the 12 OECD Principles on Water Governance (OECD, 2015) and the resilience-oriented governance principles of Biggs et al. (2012), the analysis reveals both enabling conditions and structural barriers that shaped the policy's trajectory, from early momentum to its stagnation.

Chile represents a particularly instructive case due to its pronounced water scarcity (Garreaud et al., 2020; Barría et al., 2021a), historically market-based water governance model, and recent reform attempts undertaken in a context of evolving political dynamics. Despite international consensus on the need for multilevel, inclusive, and planning-based water management approaches (Pahl-Wostl and Knieper, 2023; Hong et al., 2024), the country's progress has remained limited, often responding reactively rather than proactively to structural changes (Budds, 2013; Budds and O'Reilly, 2023; Fernández and Vásquez-Lavín, 2025). As discussed in this article, the Basin Councils policy was no exception; it faced significant limitations in terms of effectiveness, efficiency, trust, and stakeholder engagement, illustrating how historical legacies and political dynamics should be considered in policy design, particularly when aiming to transition toward more participatory, integrated, and adaptive governance models (Aylett, 2015; Boelens et al., 2016).

While grounded in the Chilean experience, these findings offer valuable lessons for other countries seeking to implement policy reforms that promote socio-ecological resilience.

5.1. Effectiveness: policy coherence and institutional design to promote polycentric governance for managing complex socio-ecological systems

As presented in Table 1, the Basin Councils policy was launched in an enabling policy context. However, the opportunity to capitalize on these advancements was largely missed due to significant implementation barriers and policy design (Chapter 4).

A central issue at Moment 1 was the lack of clarity regarding institutional roles between central and regional governments, and regarding the functions of water user organizations (WUOs), which generated confusion and resistance (Principle 1). What was envisioned as a co-constructed framework sensitive to Chile's territorial and social diversity instead provoked opposition from 24 WUOs, who questioned the legality of the policy and, by Moment 2, withdrew their participation (Cámara de Diputadas y Diputados de Chile, 2023b). This disruption marked a critical missed opportunity to advance polycentric governance, an approach considered essential for building resilience in complex socio-ecological systems (Biggs et al., 2012).

Policy coherence (Principle 3) also proved a persistent challenge. The emphasis on infrastructure-based responses (e.g., dams, desalination), the misalignment of existing planning instruments (such as irrigation subsidies under Law N°18.450), and the parallel rollout of initiatives like the MERH—without clear articulation of their relationship to the Basin Councils—further fragmented the governance landscape. The MERH, in practice, deviated from the participatory intent of the Councils and instead reinforced a state-centric, non-binding approach.

Although four Technical Macrozonal Units (UTMZs) were created during Moment 1, the lack of sustained funding for their operation and national expansion led to their discontinuation by Moment 2. This further revealed inconsistencies in policy prioritization and coherence, undermining the state's capacity to promote cross-sectoral coordination and territorial integration. The outcome reflects a deviation from resilience-based governance principles, particularly those that call for recognizing and managing river basins as complex adaptive systems.

5.2. Efficiency: resources and implementation support to encourage learning and experimentation

By Moment 1, the legislative advancements, including reforms to the Water Code and the enactment of the Climate Change Framework Law, established a robust legal basis for water security (Rivera et al., 2023), integrated water management and a watershed-based governance approach, consistent with Principle 7 of water governance (legal framework). These developments signaled a promising shift toward aligning national policies with international water governance standards with the launch of Basin Council public policy (Ministerio del Medio Ambiente, 2022a).

However, by Moment 2 the absence of the promised Basin Councils legislation and the failure to institutionalize their functions further weakened implementation. Policy signals were inconsistent, and the lack of follow-through on key commitments reflected a broader misalignment between goals and means. This reduced not only institutional capacity but also public confidence in the durability and seriousness of the reform.

Moreover, a core failure of the Basin Councils initiative was the insufficient allocation of financial and technical resources—an impediment to efficiency as defined by the OECD (2015). As aforementioned, although at Moment 1, the government created four Technical Macrozonal Units (UTMZs) to support implementation, it failed to provide sustained funding or expand these units nationally, undermining their ability to build local capacities, share knowledge, and support multisectoral basin-scale planning—functions critical for adaptive governance and for operationalizing resilience.

Additionally, the deactivation of the Basin Councils' official website by Moment 2 represented a further setback in terms of Principle 5, impeding access to policy updates and weakening public accountability.

The discontinuation of the Basin Councils' co-creation model without transparent justification or meaningful stakeholder dialogue marked a critical departure from the resilience principle of encouraging learning and experimentation (Biggs et al., 2012). Adaptive governance relies on iterative feedback, institutional reflexivity, and the willingness to adjust and improve policy through experience (Foxon et al., 2009). In this case, the failure to institutionalize such learning mechanisms not only stalled reform but also narrowed future windows for inclusive and resilient water governance.

5.3. Trust and engagement: legitimacy, inclusion, and transparency to broaden participation

A key dimension of the OECD framework—trust and engagement—was also significantly weakened during the policy's trajectory. Although Principle 10 (stakeholder engagement) was present in early stages, the absence of formal statutes and guarantees, combined with legal ambiguity and communication gaps, contributed to growing mistrust (e.g. Cámara de Diputadas y Diputados de Chile, 2023b).

The MERH initiative, created through Exempt Resolution No. 333 (MOP, 2024e), reinforced a centralized governance model that marginalized existing river surveillance boards and downgraded the role

[4] Retrieved from the minutes of sessions No. 258 and 262 of the CNR Council of Ministers.

of WUOs. Its non-binding nature, state-centric composition, and lack of connection to earlier participatory efforts marked a sharp departure from the participatory ethos of the Basin Councils and resilience-oriented principle "Broaden participation".

Further weakening legitimacy was the limited public dissemination of information. Although updates were provided to Congress upon request (e.g. Cámara de Diputadas y Diputados de Chile, 2023a; Cámara de Diputadas y Diputados de Chile, 2024; Senado de Chile, 2023), the broader public had little access to meaningful updates or channels for feedback—contravening transparency standards under Principle 9 (transparency and integrity) and commitments under the Escazú Agreement (Supreme Decree No. 209).

5.4. Concluding remarks

The Basin Councils policy represented a strong initial step toward participatory, adaptive basin-scale governance. However, its shortfalls-in design, coordination, financing, and stakeholders' engagement- prevented it from achieving its intended objectives. Its trajectory underscores that even when legal frameworks are in place, institutional coherence, stakeholder inclusion, and sustained political support are essential for resilience.

Learnings for Chile and other countries include:

- **Institutional design must enable polycentric governance:** Clear, legally supported arrangements across governance levels are necessary to coordinate actors and manage complexity.
- **Participation requires resources**: Inclusive governance is not achieved solely through invitations. Long-term investments in stakeholder engagement, capacity building, and trust are critical. In this regard, the institutional design should be operationalized by public institutions with expertise and adequate resources**.**
- **Historical legacies matter:** Deeply embedded water market systems and centralized traditions shape how reforms are perceived. These legacies must be acknowledged and addressed in reform strategies.
- **Recognize basins as complex adaptive systems**: Policy reversals that prioritize short-term infrastructure over participatory planning undermine resilience and intergenerational fairness (Principle 11).
- **Embed learning and experimentation:** Governance systems must be equipped with platforms for feedback, iteration, and institutional adaptation, especially under climate uncertainty.

Ultimately, the Chilean experience affirms that building resilient water governance is not just a technical task. It requires aligning laws, institutions, and practices within a framework that embraces complexity, inclusivity, and adaptation.

CRediT authorship contribution statement

Christian Rojas: Writing – review & editing, Writing – original draft, Validation, Formal analysis. **Daniela Rivera:** Writing – original draft, Validation, Supervision, Funding acquisition. **Guillermo Donoso:** Writing – review & editing, Writing – original draft, Validation, Supervision, Funding acquisition. **Anahí Ocampo-Melgar:** Writing – review & editing, Writing – original draft, Validation, Conceptualization. **Catalina Pérez:** Writing – original draft, Visualization, Formal analysis, Data curation. **Pilar Barría:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Formal analysis, Conceptualization.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.envsci.2025.104177.

Data availability

No data was used for the research described in the article.

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