Global Water Partnership

How water resources management can support climate-resilient development in Chile

ABOUT THIS BRIEF

Water is a 'climate connector' – impacts of climate change on water will flow through all sectors of the economy and across national borders. This brief explains why integrated approaches to water management are essential for climate-resilient development, how Chile has laid a solid foundation in that sense, and what needs to change if Chile is to meet its commitments under the Paris Agreement and achieve the Sustainable Development Goals (SDGs).

SDG target 6.5, on integrated water resources management (IWRM), can make that climate connection. This brief looks at all four dimensions of IWRM, namely the enabling environment, institutions and participation, management instruments, and financing.

RECOMMENDATIONS

Key stakeholder(s)	Recommendation
Council of Ministers of Sustainability and Climate Change (CMS) Ministry of Public Works (MOP) - General Directorate of Water (DGA) Ministry of the Environment (MMA)	1 Develop a unified integrated water resources management (IWRM) implementation strategy, acknowledging current climate hazards and future climate risks. 2 Expedite the process of preparation and publication of the National Adaptation Plan for the water resources sector.
Government of the Republic of Chile Ministries/agencies with water as part of their mandate	3 Establish a central governmental institutional entity to coordinate integrated water resources management (IWRM) across sectors and actors at the level of water basins to ensure coherence of aims under multiple sectoral interests and efficient management of water resources, to better prepare and respond to climate hazards.

RECOMMENDATIONS CONTINUED...

Key stakeholder(s)	Recommendation
DGA Regional Climate Change Committees (CORECCs)	4 Strengthen government power to regulate and monitor systems for water availability and water usage; and technical capacity to use climate information not only for integrated planning of water resources management and development, but also for day-to-day management decisions.
CMS	5 Strengthen the design of Strategic Basin Plans for water resources management, considering adaptation to climate change and investment opportunities for drought and flood management.
Water user associations (OUAs) Ministry of Finance	6 Leverage further finance for climate-responsive IWRM from Chile's well-established private sector, utilising international climate funds such as the Green Climate Fund. An IWRM financing strategy could be developed alongside the Sectoral Adaptation Plan for Water Resources.
	7 Strengthening and training of OUAs for their linkage to early warning systems and strategic climate planning.
Ministry of Foreign Affairs DGA CMS	8 Address climate-related risks in national and sectoral policies related to transboundary waters. In existing dialogues and mechanisms with neighbouring countries, take into consideration the potential for climate-related risks in shared waters.

THE CHALLENGE

Water-related impacts of climate change are worsening in Chile, increasing flooding and drought risk, and melting glaciers. These impacts in turn affect water availability and water quality, hindering access to safe drinking water, food security, and energy security linked to the country's high dependency on hydropower.

Chile has abundant water resources, but its waters are unequally distributed throughout the country. The north is home to the Atacama Desert, one of the most arid places on the planet, but water availability increases progressively towards the southern part of the country.[1]

Per capita water availability ranges from **52 m³/year** in some parts of the country to **2.9 million m³/year** in others.[2]

Temperatures are expected to increase by **1.6°C** over the next 30 years, and mean annual precipitation is expected to **decrease by 55 mm by 2050**.[3]

Overall, there has been a drying trend of 8% per decade in the central and southern parts of the country (1960–2016), and less pronounced declines in rainfall in the wetter regions.[4]

The prolonged drought of 2008–2022 has affected much of the southern and central areas. In addition, changes in temperature, precipitation, and surface water flows are contributing to land-use change and exposure to severe winds, and driving glacier and snow melt.

According to the Intergovernmental Panel on Climate Change special report on oceans and cryospheres, climate change is causing a decrease in the total surface area of glaciers in the world. This situation will affect the flow of rivers, particularly in northern and central Chile, where glaciers supply about 70% of the flow in extreme drought events.

Projections suggest that the "annual severe drought likelihood for the country will increase by **34% by mid-century and 63% by the end of the century**".[5] Climate-related water scarcity will likely be concentrated in the central and northern regions.

Chile is ranked among the 30 countries with the highest water-related risks by 2025, including increased severity of droughts and floods.[6]

Water-related climate risks cost Chile **USD$2.2 billion** from hydrological climate events from 2013 to 2018,[7] including from wildfires, floods, and flash floods.

For renewable energy, the vulnerability of hydropower generation is a concern. In 2018, just under **30%**[8] of Chile's energy mix was generated through hydropower.[9]

Drought has impacted electricity prices and caused an increase in emissions due to fossil fuels replacing hydropower when precipitation decreases.[10]

The interconnected nature of the water-related climate challenges in Chile

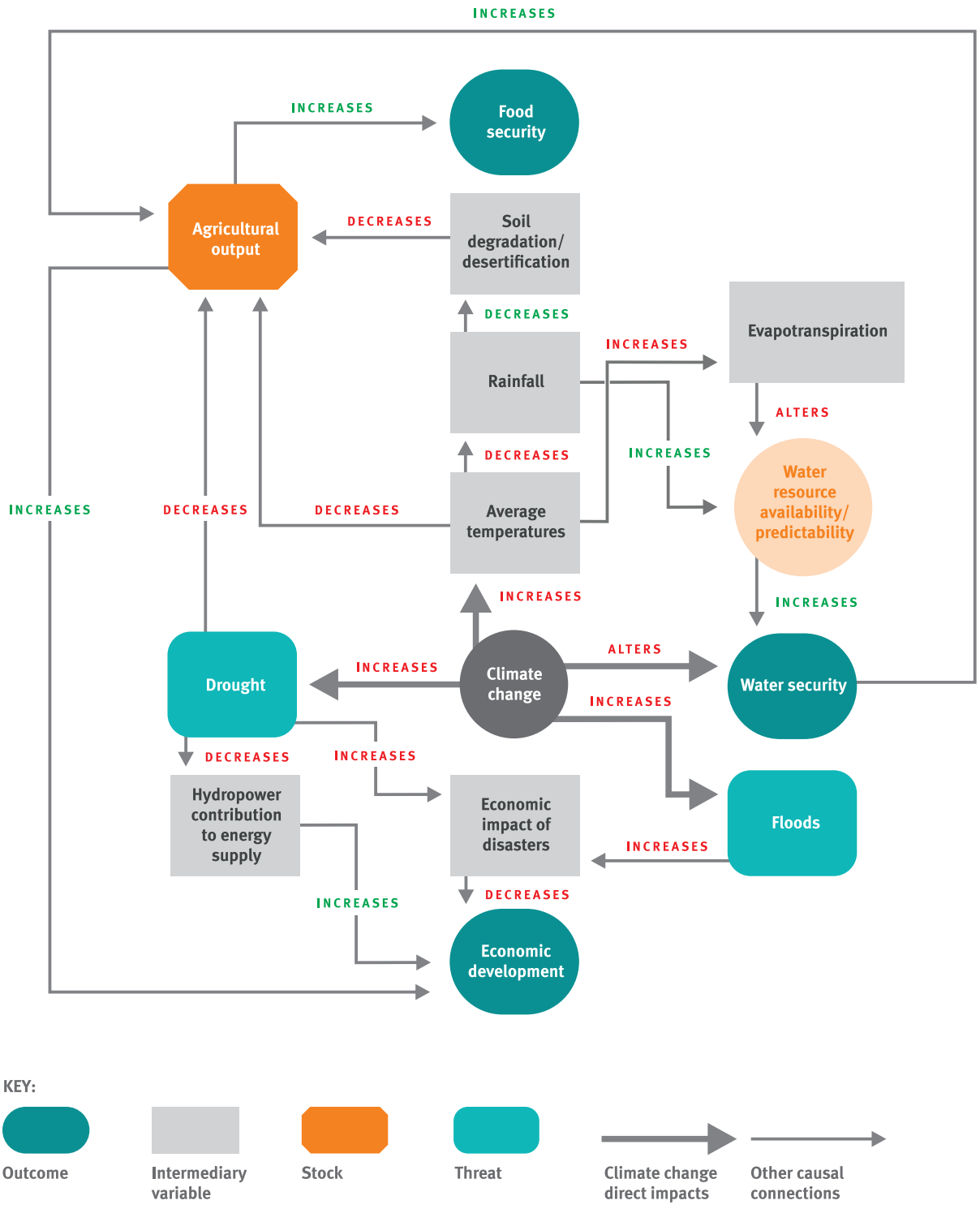
As with the water–energy–food nexus, climate resilience and sustainable development are interconnected. The diagram below maps the relationships between some of the key climate challenges that Chile faces, showing why coordinated, integrated, and cross-sectoral responses are required to adapt to the impacts of climate change.

At the centre of the diagram is water resource availability/predictability, which is impacted by climate change (as shown by the words written on the arrows between the variables). The complex relationship between climate change and water availability/predictability is not shown here for reasons of space. The word 'alters' is used to describe the fact that climate change can affect the timing and amount of water availability in multiple ways, including via shifting seasonality, changing frequency and intensity of rainfall events, increasing or decreasing average precipitation irrespective of the intensity of rainfall events, and affecting water quality – all while increasing uncertainty in changes and shifts in the water cycle and thereby reducing our ability to use past hydro-meteorological guides as a reliable predictor of water availability.

To illustrate the accurate reading of this diagram, two causal chains are described:

- **Causal chain 1**: Climate change is increasing the frequency and severity of both floods and droughts. Both impact economic development in Chile. Continued and increasing drought adversely affects not only the agricultural output of the country, and subsequently, the overall economy, but also hydropower generation, a key source of energy in Chile. The economic impacts of floods have been the most severe of Chile's water-related disasters and will continue to increase with climate change.
- **Causal chain 2**: Climate change will increase temperatures, which will lead to a decrease in precipitation and an increase in evapotranspiration. Both will lead to a decrease in water security and reductions in agricultural output, which will reduce both food security and economic development.

THE INTERCONNECTED NATURE OF WATER-RELATED CLIMATE CHALLENGES IN CHILE



ENABLING ENVIRONMENT

What do key policy statements say about the integration of water, climate, and other SDG agendas?

The 2022 ratification of reforms to Chile's 1981 National Water Code has introduced a paradigm shift in Chile's approach to water management – now incorporating integrated approaches to management of the resource, considering climate risks, and establishing a fund for public financing of research, innovation, and education in water resources. The reforms provide for the creation of strategic water resources plans, to be updated every ten years. In the context of existing important government programmes at the intersection of water and climate change, and the recognition of water in Chile's National Climate Change Act, its National Adaptation Plan (NAP), and its National Energy Policy, there is a strong rationale for developing a unified strategy for integrated approaches to water resources management and development, and for harmonising Chile's existing National Water Resources Strategy, in order to take full advantage of the recent strides in strengthening the enabling environment for climate resilience via water management.

POLICY STATEMENTS

SECTOR	KEY POLICY STATEMENTS (INCLUDING LAWS, STRATEGIES, AND PLANS)
Cross-sectoral	■ Agenda 2030
Climate change	■ National Adaptation Plan (2017) ■ Intended Nationally Determined Contributions (2015, 2020) ■ National Climate Change Action Plan (2017–2022) ■ Climate Change Act (2022)
Water	■ Reform of the National Water Code (2022) ■ Urban Wetlands Law (2020) ■ National Water Resources Strategy 2012–2025 (2013) ■ National Water Code (1981; updated 2005, ratified 2022)
Energy	■ National Energy Policy (2015)

Chile's long-term sustainable development policy, Agenda 2030, lacks comprehensive acknowledgement of IWRM. Chile's 1981 National Water Code focused on important aspects such as law, water quality, environmental flows, and water markets, paying minimal consideration to integrated management of the resource, and of climate change impacts. It emphasised the primary role of water-rights holders in water management[11] through market-based (tradable) allocations. Laws were based on the sectoral use of water resources but not on their integrated management,[12] including the integration of climate risks into overall planning.

This paradigm has shifted following the reform of the National Water Code, ratified by Law No. 21,435 of 6 April 2022.[13] The recent reform incorporates essential elements of IWRM and climate risk management into the National Water Code and provides for the creation of strategic water resources plans, with periodic updating every ten years, establishing a strong basis for developing a unified strategy for integrated approaches to water resources management and development. The reform also defines the creation of a Fund for Research, Innovation and Education in Water Resources, under the Ministry of Public Works, which will be executed through the General Directorate of Water. This fund will provide resources for managing scientific information and elaborating, implementing, and monitoring strategic plans for water resources in basins. Coming from Chile's public sector budget, such resources may represent the national counterpart to private and international climate financing.

Chile's National Water Resources Strategy 2012–2025 highlights the need for efficient and sustainable water resources management and the need to improve institutions and social equity, combat drought, and improve citizens' awareness of issues around water. Climate change rarely enters the strategy; however, IWRM is emphasised, with a goal to establish policies that incentivise its application.[14] To harness fully the benefits of the reformed National Water Code, the National Water Resources Strategy must be updated.

Chile's new Climate Change Act, adopted in June 2022, identifies water resources as a key area to develop a sectoral adaptation plan, because of the adverse effects of climate change on the resource. The Act states directly how the impacts of climate change on water affect many

other sectors in Chile, including infrastructure, health, mining, energy, urban areas and tourism, among others. Article 13 also goes into depth about developing Strategic Water Resources Plans as a key area of focus as part of addressing climate change in the country.[15]

The NAP, developed in 2017, recognises water-related climate impacts, especially on water-dependent farmers in dryland areas, and the role of high-altitude ecosystems in ensuring downstream water supply. To strengthen IWRM, it is recognised that water-related actions cut across multiple sectors, including infrastructure, rural development, and energy, and that these provide strategic entry points for a more joined-up approach. The NAP and the National Action Plan on Climate Change (PANCC, 2017–2022) highlight the need for adaptation planning in both the water 'sector' and for cities, with Sectoral Adaptation Plans linked to the corresponding NAP. The Nationally Determined Contribution (NDC) also acknowledges the importance of water resources and is in alignment with the NAP and PANCC.

In terms of public policy instruments at the intersection of water management and climate change, the Apruebo Dignidad government programme[16] is noteworthy. The programme establishes two main relevant points: (1) it recognises that basin organisations provide institutional mechanisms for deliberation, planning, and coordination at the intersection of water and climate, within an IWRM framework; (2) it proposes the guidelines: 'Climate crisis, just transition, and new environmental institutions', which establish as a priority adaptation to climate change; the conservation of natural resources with special attention to water; and the creation of a sovereign fund for adaptation to climate change, as a goal of the current president's administration.

Regarding urban issues, none of the current climate strategies clarifies the role of cities in climate change mitigation and adaptation. However, sectoral ministries and their subsidiary authorities support climate-smart urban development. The National Urban Development Policy, for example, aims to foster "sustainable cities" and "quality of life". The Regional Development Strategy (2012–2021) of the Metropolitan Region of Santiago recognises climate change as a threat to achieving a "Clean and Sustainable Santiago". Both aim to achieve their goals through the promotion of regional adaptation systems in planning processes, identifying hazards, and the efficient management and use of water.[17] However, corresponding measurement indicators to track implementation progress are unclear or incomplete, and are not aligned with target values.[18]

In terms of energy, the National Energy Policy: Energy 2050 and the PANCC have a goal to achieve 70% of the energy mix with renewable energy by 2050, including through the promotion of sustainable hydropower. However, Chile is simultaneously considering climate variability in energy planning, including 'upping' the share of non-hydro power (including solar) in the energy mix to offset climate risks to hydro dams.[19] In addition, there is a new renewable energy and water deal to improve water management and reduce electricity prices for the consumer.[20]

Chile's NAP identifies disaster risk reduction as one of four cross-cutting actions acknowledging hydro-meteorological extremes,[21] and provides scope for increased coherence between Chile's disaster risk management plans and climate adaptation for the implementation of the NAP.[22] Chile's Strategy for Disaster Risk Management focuses on institutional strengthening, upgrades to monitoring and early warning systems, developing a culture of prevention and resilience building, addressing transversal aspects of disaster risk, and investing in preparedness to achieve an effective response.

Even though transboundary river basins are shared with Argentina, Bolivia, and Peru,[23] water-related climate impacts on shared rivers are not recognised in national or sectoral policies.

INSTITUTIONS

Are Chile's institutions ready to manage the impacts of climate change on water resources and on other water-related sectors in an integrated way?

In Chile's 2022 Climate Change Act, the Council of Ministers of Sustainability and Climate Change (CMS) serves as a multisectoral decision-making entity that includes collaborations with the DGA, through the MOP. Decision-making across the water sector is complex, given it is overcrowded with 40 public institutions and 4,000 private OAUs. Institutional collaboration and coordination are not clear between these and the Regional Climate Change Committees (CORECCs).

The main mechanisms for cooperation and coordination on climate change issues between institutions responsible for IWRM and those responsible for climate mitigation and adaptation are through (i) formulation of the NDC including the ETICC (Inter-ministerial Technical Team on Climate Change) and ETMRV (Monitoring, Reporting and Verification Team)[24] (created in 2018); (ii) the CMS; and (iii) the CORECCs (created in 2017). In addition, in the lead-up to hosting the 25th United Nations Framework Convention on Climate Change Conference of the Parties (COP25) in December 2019, the Chilean government created seven scientific working groups relating to climate change, with one dedicated to water, aiming to create new tools for water management.[25]

Lasting approximately four years, the successful development of the Intended Nationally Determined Contributions (INDC) included work from over 50 experts and a participatory process that included the public and private sectors, academia and field experts for information gathering, workshops and technical meetings, and public participation. In addition, civil society organisations have been involved in public consultations and regional information workshops, with the approval of the CMS. However, this process is not institutionalised for the five-year reviews of the NDCs, including the formal participation of ETICC and ETMRV. The ETICC supports the Ministry of the Environment (MMA) by facilitating the preparation, implementation, and monitoring of national policies and international agreements signed by the country on climate change issues. It is made up of representatives of public institutions who are knowledgeable about climate change. The PANCC 2017–2022 considers the ETICC a key component of Chilean climate institutions in the preparation and implementation of actions in the four areas of the NAP, which would include the proposed NAP on Water Resources.

The CMS is the multisectoral body in charge of deliberating and approving public policies and regulations related to environmental issues, including with the MOP where the DGA sits. Whereas before Chile's new Climate Change Act, the MMA was responsible for implementing Chile's actions on climate change, this has now been decentralised across several government agencies with the CMS at the highest level. The CMS is also supported by a Scientific Advisory Committee, which helps incorporate and utilise science when instruments related to climate change are developed. The National Council for Sustainability and Climate Change provides an avenue for public participation through which members of civil society, academia, and the private sector can engage.[26]

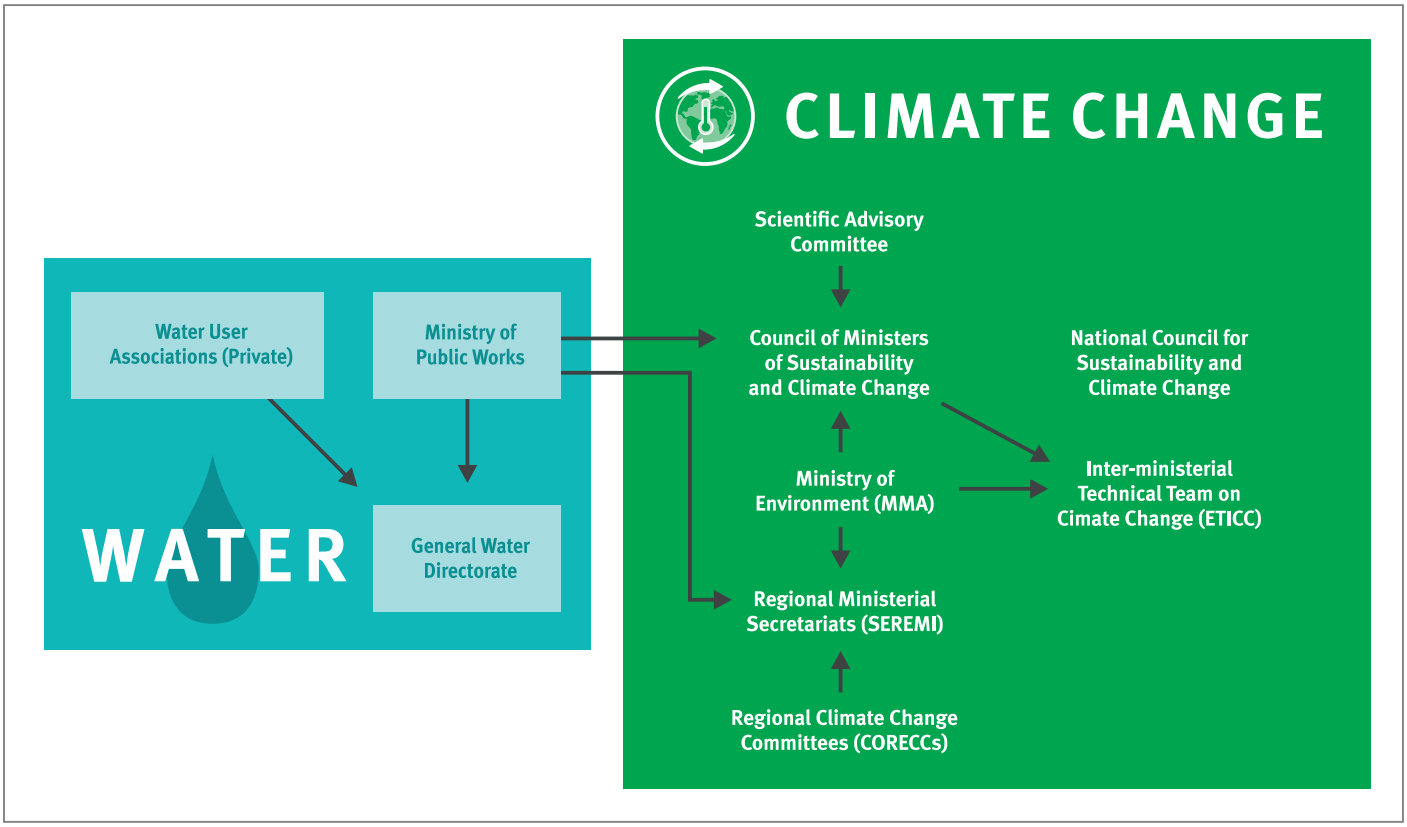
The collaborative arrangement between MMA and MOP is from subnational level CORECCs through regional ministerial secretariats, which aim to "promote and facilitate low-carbon and climate-resilient regional development, through the development and implementation of climate change policies, plans, and actions, while integrating different sectors' management plans." Approximately 40 different government institutions across multiple sectors support the functioning of the water market, including the DGA responsible for issuing and managing water rights and the 4,000 private water user associations (OUAs) that manage rights holders. It is not clear how they work with respective CORECCs.

Chile's water sector could be viewed as overcrowded with organisations and interests, and challenges lie in the efficiency of water resource management and the ability of individual OUAs to correct for market failures, given their low technical, financial, and administrative capacities.[27] This includes the ability of OUAs to (i) manage water resources in the public interest with consideration of downstream effects or impacts on groundwater users, and (ii) resolve issues, in circumstances where rights holders currently resolve disputes either through voluntary negotiations, involving respective OUAs, or through ordinary civil courts, as no government agency has the authority to intervene in water conflicts. However, due to the lack of effective conflict resolution mechanisms, numerous conflicts end up in the hands of legislators,

many of whom lack legal grounding in water management. This can create further delay and conflict. The DGA is only able to intervene in water management in the case of an official declaration of water scarcity.[28]

Regarding energy, the Hydraulic Works Department embedded in the MOP, which plans, designs, coordinates, and supervises the construction of major hydraulic public works, including water dams, has facilitated the coordination of investment implementation towards primary storm water infrastructure, flood control, and infrastructure for rural health services.

A SNAPSHOT OF THE LINKAGES BETWEEN CHILE'S WATER AND CLIMATE CHANGE INSTITUTIONS



MANAGEMENT INSTRUMENTS

Are management decisions on water and other SDG issues being guided by evidence of climate change?[29]

There are growing efforts to increase provision of quality climate change evidence for decision-makers. However, there is a lack of government institutional capacity to (1) regulate and monitor water availability and water usage, especially at river basin level; (2) use the climate information being generated in IWRM processes; (3) make existing instruments climate smart; and (4) scale up existing IWRM efforts. Chile could benefit from embedding an integrated approach to water management in its water management mechanisms; for this the country would need appropriate methodologies, indicators for monitoring and tracking, and a system for evaluation and responsive action. This presents an opportunity to include climate change in the framework of IWRM implementation monitoring in Chile.

In terms of information, Chile's Ministry of Environment has endorsed a national atlas of climate risks[30] that contains maps of the climate threat, exposure, and sensitivity in 12 priority sectors. Water resources is one of these sectors. In this section, maps of four climate impact chains are presented: floods due to overflowing rivers, floods in urban areas, risk to the use of surface water for irrigation, and hydrological drought.

There are many small-scale and pilot initiatives for IWRM, including use of watershed management instruments,[31] but there is a need to systematically understand these bottom-up experiences, look for ways to scale up successes,[32] and ensure climate change considerations are factored into flexible and implementable IWRM plans. In addition, instruments exist to measure water pollution, water savings, and energy efficiency, such as through the Clean Production Agreements (APL).[33] However, these agreements are essentially voluntary.[34]

There is a need to improve knowledge of water-related climate change impacts and future risks in Chile. There have been increases in public investment to address this need, including funding channelled through research institutes aimed at understanding the links between climate change and potential water futures.

Research findings are being used in climate vulnerability assessments used in Chile's National Communications, NDCs, and other policies. However, it is not clear how additional information is supporting decision-making processes – from planning to implementation – especially for IWRM. Efforts are hampered by a lack of technical capacity to collect, analyse, and communicate hydro-meteorological data to decision-makers across sectors.[35]

Incoherence in the wider information collection and management system for water undermines the ability to track water availability and use, and the ability to transform raw data into actionable information that could inform decision-making. For example, data on water availability – from rivers, aquifers, and glaciers – are held by the Water Directorate; the registry of water rights is maintained by DGA; and OUAs collect information on water usage.

At city level, early warning systems and urban planning processes have contributed to greater preparedness, but further work is needed to plan for long-term climate change and its impacts on water security, including for major coastal cities. The Ministry of Housing and Urban Development (MINVU) has incorporated a disaster risk management criterion into building codes, which together with early warning information is aimed at saving lives. However, there is no legislation in place that regulates the implementation of post-disaster reconstruction processes.[36] In addition, the MINVU and local governments' urban planning do not currently respond to multi-hazard events and do not account for current levels of community and infrastructure exposure to the threats of climate change and rapid urbanisation.[37] Nonetheless, city municipalities already manage waste management, irrigation, maintenance of green areas and public lighting[38] with limited resources, serving as good examples of good public provision on tight budgets. There remains low government capacity for the provision of timely early warning information, and for comprehensive data collection, ongoing monitoring, and analysis, particularly for rural areas and underserved locations.

Although there are few transboundary basins, stronger international cooperation on water-related climate change issues (e.g. via early warning systems and monitoring) is needed to address region-scale climate patterns such as the El Niño–Southern Oscillation (ENSO).[39]

FINANCING

How ready is Chile to finance water-related climate action?

Limited government control over water use trajectories and allocations is raising difficult questions about the ability of markets, alone, to manage the long-term risks posed by climate change. Although the government has been able to protect priority sectors, e.g. through subsidies for irrigation, a longer-term perspective is needed that reflects social and environmental priorities. More public and private financing is required for IWRM to address these longer-term concerns.

Overall, public and private financing for IWRM is inadequate, and limited funds are earmarked mainly for the 'productive' sectors (e.g. agriculture, energy), rather than for the protection, rehabilitation, and management of water-dependent ecosystems and biodiversity.[40]

Current sources of finance for water-related climate actions range from 'soft' investments by the government into research, and hard investments in water infrastructure. Trends show that most international climate finance has been allocated for climate mitigation actions, including hard investments for renewable energy such as hydropower generation and solar, rather than climate adaptation, including water conservation and demand management. Finance sources have included:

- Government sectoral budgets, albeit with no dedicated flows to water-related climate actions. The government also raises revenues from levies on water users at basin, aquifer, or subnational levels.[41]
- The Environmental Protection Fund managed by the Ministry of Environment is the only competitive fund granted by the Chilean Government for environmental issues. The fund supports research projects including (i) 'Determination of extreme climate indexes to visualise climate change and its possible incidence on hydric resources of the region'; and (ii) 'Nunatak-Chile, First Natural Laboratory on Glacier Pollution and Climate Change, baseline collection'.[42]
- International loans for banks to fund large-scale green projects, such as those to Banco BICE. In 2013, the bank received a US$75 million loan from the International Finance Corporation (IFC) to fund long-term non-conventional renewable energy projects.[43]
- International climate finance, such as that from the Green Climate Fund (GCF), for projects/programmes typically led by the private sector for forestry and large-scale energy generation.

Data from the main Organisation for Economic Co-operation and Development donors who have tagged their projects as 'climate-related' show that for 2012–2017, commitments to projects for water with a climate focus totalled US$361 million in debt instruments and US$4 million as grants. Of the loans, the vast majority of funds (US$345 million) has been allocated to hydro-electric projects, with US$16 million earmarked for water sector policy and administrative management. The small amount of grant financing has also been allocated to other activities, including river basin development, water resources conservation, and basic drinking water and sanitation provision.

There are currently no transboundary water management projects with a strong climate change dimension identified. The Adaptation Fund has endorsed the concept of a regional disaster risk reduction project, 'Enhancing Adaptive Capacity of Andean Communities through Climate Services (ENANDES)', supporting Andean communities in Chile, Colombia, and Peru. This includes a component on regional–national climate monitoring and forecasting and decision-making.

There is still an overall dependency on international financing. However, from 2017, Chile has been classified as a high-income economy and as such is no longer eligible for official development assistance.[44] The reduction of loans and grants to national ministries and other entities may affect overall budget allocation,[45] but the impact to date is unclear. International climate funds such as the GCF are still accessible and remain strategically important, although, while Chile has received various readiness support from the GCF, there is as yet no national accredited entity that can directly access and manage funds. Given Chile's large private sector, there is potential to leverage private investments through GCF funding.

For urban areas, city municipalities are not well positioned to access finance for water-related climate actions, including public budgets, development finance, private sector investments, and even climate finance. Barriers include a lack of awareness and public attention given to climate change; a lack of knowledge, skills, and capacity including in accessing climate finance,

developing relevant project proposals, and ability to track climate finance; inadequate institutional structures and processes; detrimental national legal and regulatory framework conditions; unfavourable economic and risk profile of climate projects; and a lack of funds and financial mechanisms at city level.[46]

Also, city municipalities only have approximately US$4–5 million to spend on waste management, public lighting, and maintenance of green areas. As a result, 254 of the country's 345 municipalities were heavily indebted in 2015. Cities have access to the following funds: contributions from the National Fund for Regional Development (FNDR), which is mainly used to finance infrastructure projects demanded by the municipalities, which have to comply with Chile's environmental regulations and should be in line with national priorities; contributions from the Municipal Common Fund, the mechanism that allows for sharing of revenues between municipalities across the country; own-source revenues from charges for the services they provide and for the permits and concessions they grant; and subsidies.

Overall, mainly from the uneven distribution of the FNDR, city budgets are highly unequal across Chile, with differences being harshest in Santiago.

On energy, it is estimated that over US$24 billion will need to be invested in energy infrastructure alone – well beyond the limits of government budgets. Leveraging finance from the private sector is necessary to meet Chile's INDC, where private investments in clean energy already amount to US$8.5 billion for 2009–2015. A third of banks in Chile are financing renewables, including wind, solar, and small-scale hydropower. However, limited understanding of the technologies involved, lack of project finance skills, and the small size of projects has resulted in limited overall funding. Moreover, the banks' dependency on international development finance institutions for concessional finance is not sustainable in the long term, because of concerns over high interest rates and exchange rate fluctuations. New, longer-term sources of finance are needed, including those that could be attracted from pension funds.[47]

CHILE'S CLIMATE FINANCING LANDSCAPE

US$294 million

Climate finance from the **multilateral climate funds** to Chile focused on mitigation and adaptation totalled US$294 million (as of January 2022).[48]

US$62.8 million was allocated to **water-focused** projects.

US$1.53 billion

Bilateral and multilateral external development funds dedicated to climate change-related sectors for the period 2000–2020 in Chile are estimated at US$1.53 billion.[49]

US$54.2 million was allocated for **water-focused** projects (**3.5%** of total official development assistance for climate change)

US$19.4 million was allocated to water-related **adaptation** projects

US$34.8 million was allocated to water-related **mitigation** projects

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[29] Relevant categories of evidence include historic and projected climate data (rainfall, temperature) as well as impacts on water resources, e.g. water availability, quality/pollution, use and extremes. Relevant specific uses of evidence/management applications include regulation, water allocation, basin management, programme management, investment design, policy formulation, and disaster risk reduction/early warning.

[30] Chile's national atlas of climate risks, including via water. Available at: https://arclim.mma.gob.cl/atlas/sector_index/recursos_hidricos/

[31] IWRM portal, SDG6.5 questionnaire results Chile.

[32] GWP, SDG6.5 Workshop Report Chile, 2018.

[33] As indicated in the IWRM portal, SDG6.5 questionnaire for Chile, NAMA project – 'Clean Production Agreements in Chile' 2002–2020, that promoted cleaner production in the industry sector. This is coordinated by the National Council for Clean Production (NCCP), an institution under the Ministry of Economy. The main aim to is to reduce greenhouse gases through its management instrument CPA. It is a voluntary agreement negotiated and signed by the representative of the industrial organisation on behalf of the companies in a particular productive sector and public administration sector. Co-benefits across social, economic, and environmental dimensions include water and raw material savings and improved land use practices.

[34] IWRM portal, SDG6.5 questionnaire results Chile.

[35] Climate Change Knowledge Portal, World Bank, Chile, and Chile's Third National Communications.

[36] Center for Excellence in Disaster Management and Humanitarian Assistance, 2017, Chile: Disaster Management Reference Handbook.

[37] Barria, P. et al., 2019, From Multi-Risk Evaluation to Resilience Planning: The Case of Central Chilean Coastal Cities, MDPI.

[38] GIZ, 2017, Cities fit for Climate Change, Challenges and Opportunities for Urban Climate Finance – Lessons Learned from eThekwini, Santiago de Chile, and Chennai.

[39] Climate Change Knowledge Portal, World Bank, Chile.

[40] GWP workshop report Chile, 2018.

[41] SDG 6.5 Questionnaire Chile.

[42] Chile's Third National Communications.

[43] GIZ, 2017, Cities fit for Climate Change, Challenges and Opportunities for Urban Climate Finance – Lessons Learned from eThekwini, Santiago de Chile, and Chennai.

[44] Chile's Third National Communications, and GIZ, 2017, Cities fit for Climate Change, Challenges and Opportunities for Urban Climate Finance – Lessons Learned from eThekwini, Santiago de Chile, and Chennai.

[45] GIZ, 2017, Cities fit for Climate Change, Challenges and Opportunities for Urban Climate Finance – Lessons Learned from eThekwini, Santiago de Chile, and Chennai.

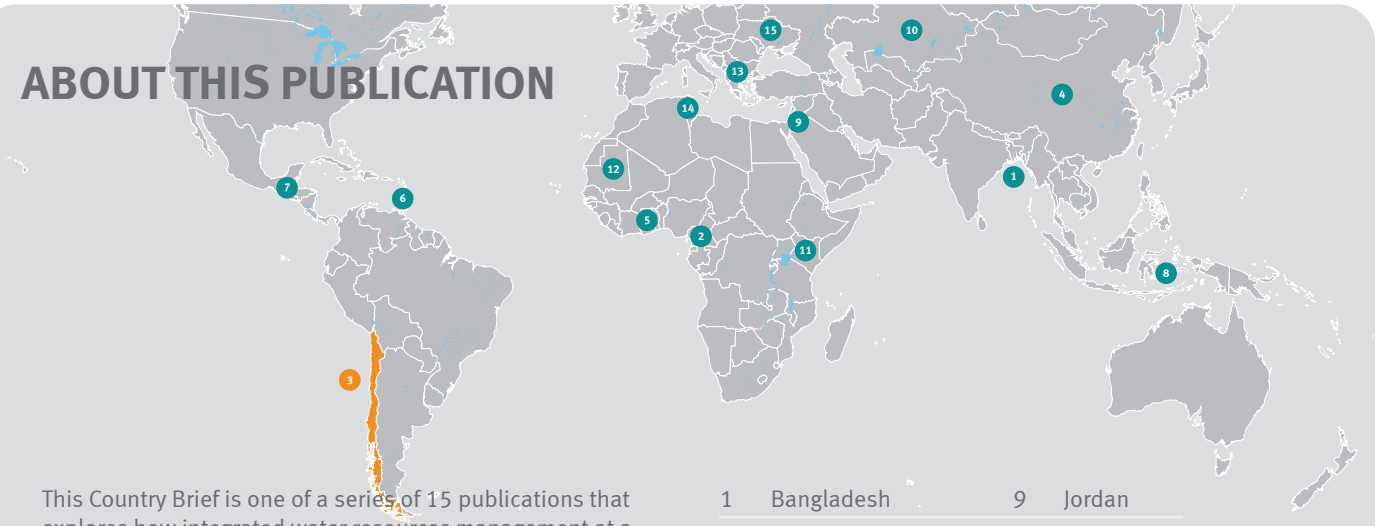
[46] GIZ, 2017, Cities fit for Climate Change, Challenges and Opportunities for Urban Climate Finance – Lessons Learned from eThekwini, Santiago de Chile, and Chennai.

[47] https://www.e3g.org/library/A-climate-finance-strategy-for-Chile

[48] Climate Funds Update, 2022. 'Chile' entries, updated January 2022. Available at: https://climatefundsupdate.org

[49] 'OECD DAC External Development Finance Statistics'. Accessed 25 July 2022. Available at: http://www.oecd.org/dac/financing-sustainable-development/development-finance-topics/climate-change.htm

ABOUT THIS PUBLICATION



This Country Brief is one of a series of 15 publications that explores how integrated water resources management at a country level contributes to climate resilience and sustainable development, as well as meeting the commitments under the Paris Agreement and achieving the Sustainable Development Goals (SDGs).

The full synthesis report, The Untold Story of Water in Climate Adaptation. Part II. 15 Countries Speak, of the work undertaken in all 15 countries is available at www.gwp.org.

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