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13th International Congress on Water Management in Mining and Industrial Processes

Infrastructure Planning for Water Security in Chilean River Basins

Oscar López, Camila Matta, Diego Mena y Julio Faúndes

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Program



1. National Public Infrastructure Plan
2025-2055
2. Background, objectives, and diagnosis
3. Strategic initiatives for water security
4. Conclusions

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1. National Public Infrastructure plan 2025-2055

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DESIGNING THE FUTURE OF CHILE

Chile is a country in constant construction. Each Project is part of our **history** and our **future**.

Today, with the **National Public Infrastructure Plan 2025–2055**, we are drawing up a **roadmap** that will enable us to face **the challenges of the 21st century**.

Building **infrastructure** to improve **people's quality of life** and build a more **equitable and resilient country for all**.

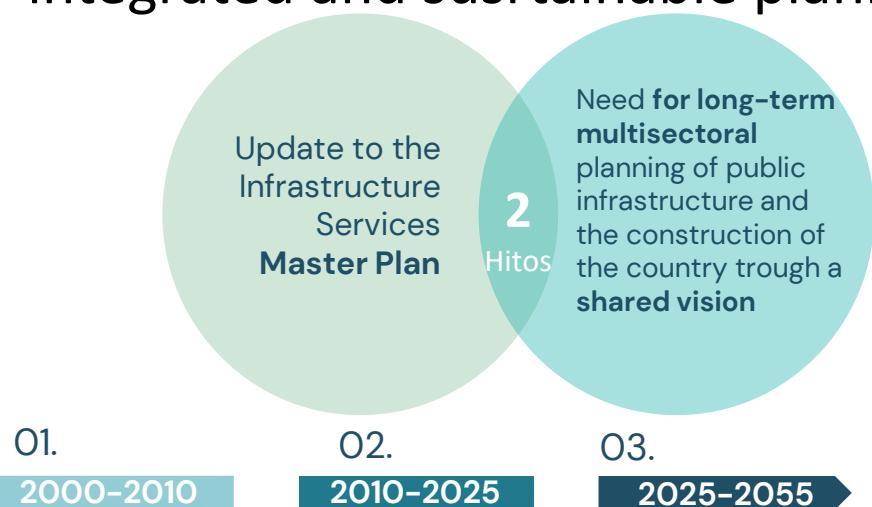
This is how we build the Chile we want.

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Genesis: The National Plan as an opportunity for integrated and sustainable planning



Scope:

Ambitious

Multisectoral and decentralized

Proposes public policies

Dynamic in future context



A collective and technical process that began over two years ago



A roadmap was developed based on a **national strategic visión**, drawn up with input from **regional, national, academic, and trade union stakeholders**.

COUNTRY VISION

2023-2024

- Meeting with Infrastructure Ministers
- Expert Advisory Committee (CEA)
- Meeting with public agencies and state-owned companies Incorporation of plans from other portfolios 113 Regional Participation

SUPPORTING STUDIES

2023-2024

- Comprehensive Analysis:  PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE
- Transport Infrastructure Analysis and Modelling: Cipres Consultores
- [Infrastructure and Water Management Analysis: Hídrica Consultores](#)

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OBJECTIVES AND GOALS

INITIATIVES

- **PORTFOLIO TO 2055**
National and regional
- **MANAGEMENT AND PUBLIC INITIATIVES**

The agreed-upon Country Vision

“Chile in 2055 Will be consolidated, as and integratedm competitive and sustainable country”, guided by five principales:



Sustainability and climate action

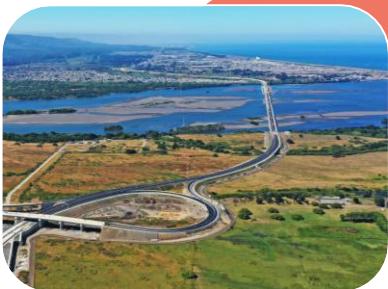
Social cohesion and quality of life

Competitive advantages and global integration

Descentralization and territorial development

Modern and agile state

Strategy



1. CONNECTIVITY AND TERRITORIAL INTEGRATION



3. WATER SECURITY



4. ENERGY SECURITY



2. HABITABILITY IN POPULATED CENTERS



El PNIP2055 is structured around four areas of action, which translate the principles of the Plan into specific planning and investment decisions.

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2. Background, objectives, and diagnosis.

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IHE
Delft
Institute for
Water Education
Under the auspices of UNESCO

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Background

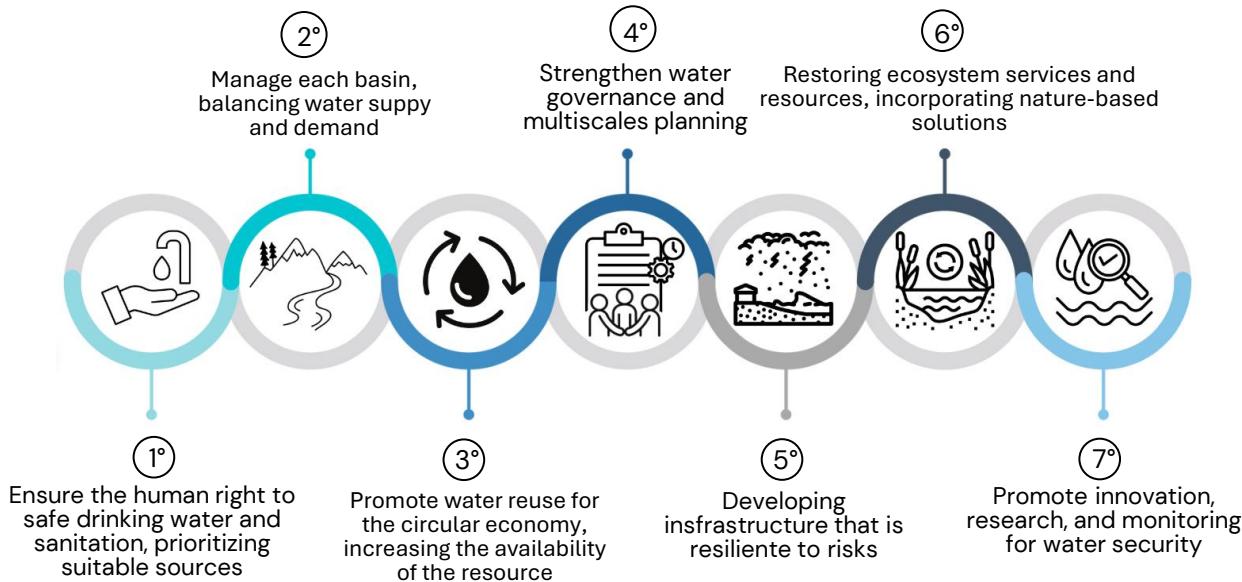
Faced with the impacts of climate change, our institutions have begun to respond by enabling new power and public policy instruments.





Objectives

Ensure water availability and sanitation for all people, strengthen resilience, and seek to balance water supply and demand in each basin, based on sustainable productive development that protects ecosystems.



Basin –scale diagnosis

Regional characterization:

- Geological
- Climate
- Hydrological
- Environmental
- Land use
- Socioeconomic factors
- Socio-environmental conflicts
- Existing water infrastructure
- Proposed water infrastructure in existing public portfolio
- Initiatives implemented in the period 2015-2023

Supply at sources and extreme events:

- Water rights. DGA.
- Restrictions on water use. DGA.
- Current and projected supply at source. DGA, 2022. National Water Balance.
- Extreme events Bibliography, SENAPRED, DGA, 2022. National Water Balance.
- Water quality. PEGH.

Current and projected demand:

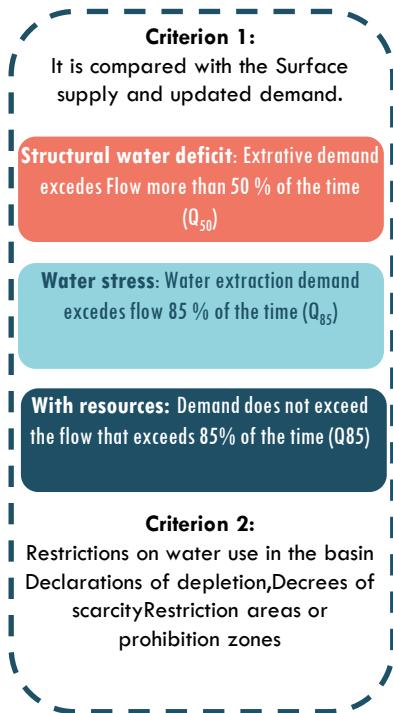
DGA, 2017. Estimation of current demand, future projections, and characterization of water resource quality in Chile.

- Urban drinking water
- Rural drinking water
- Agricultural
- Electricity generation
- Mining
- Industrial
- Forestry production
- Livestock
- Aquaculture
- Reserve for environmental protection

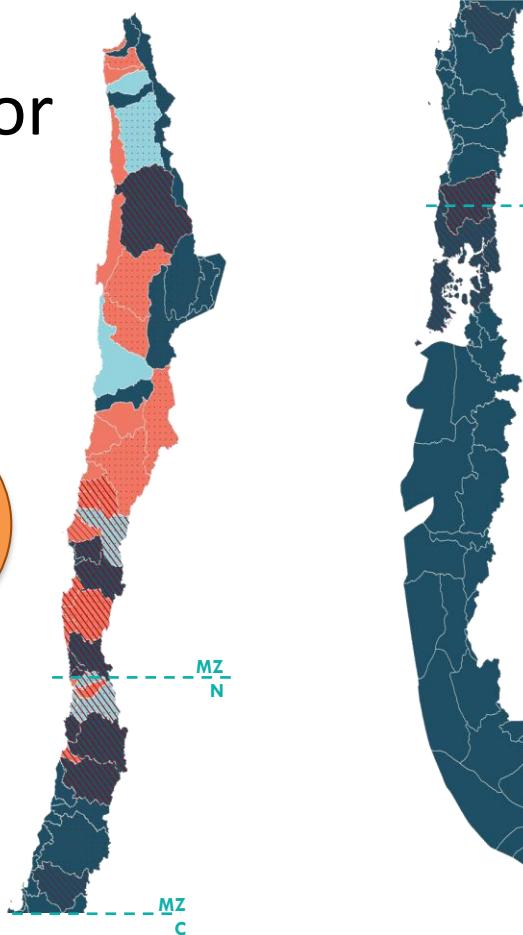
All regions of Chile are projected to experience a significant reduction in their water supply, of up to 44% compared to historical levels.



Water Balance Indicator



60
watersheds
face stress
or deficit

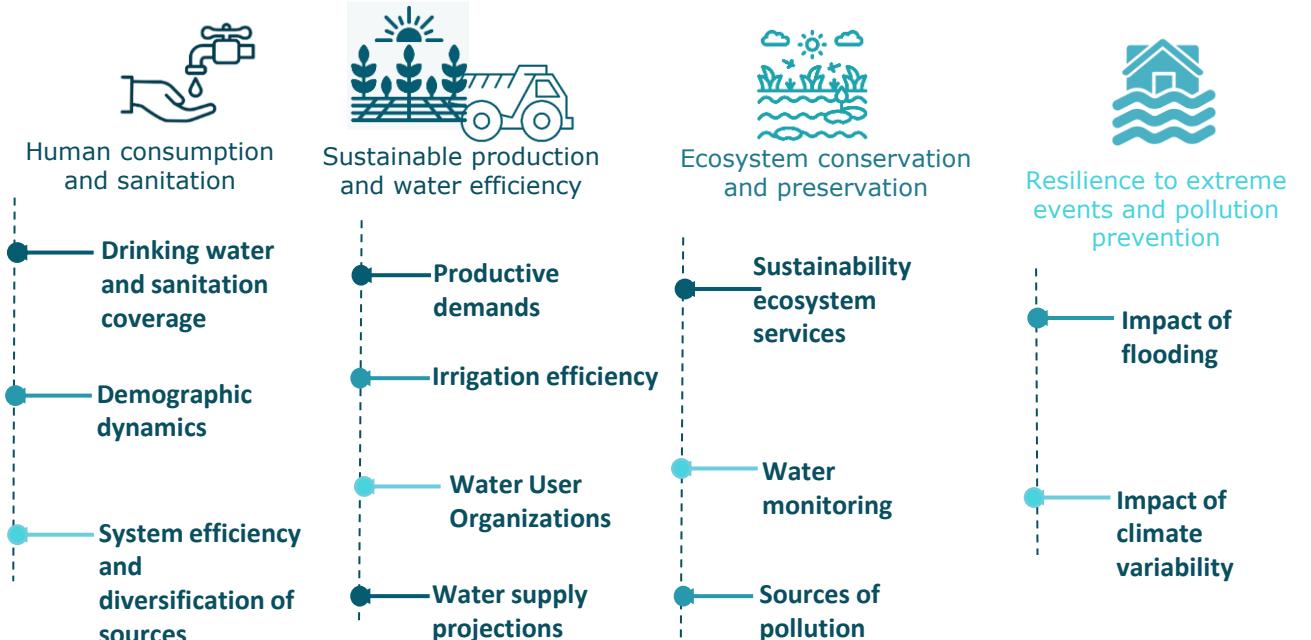


Criterion 1
Basin with resources
Basin under water stress
Basin with structural water deficit

Criterion 2
Underground
Surface

Shift in water demand towards the south of the country
If the current trend continues, consumptive demand supplied by freshwater will increase by 59% in basins without water stress, of which 32 out of 40 are located in the southern and austral macrozones.

Water security challenges



29 indicators, for example :

85 watersheds	Less than 25% of their wetlands are under protection.
22 watersheds	Alta criticidad por escaso manejo de contaminantes y pasivos ambientales
34 watersheds	High criticality due to poor management of pollutants and environmental liabilities
55 watersheds	High risk of increased impact from flooding events associated with heavy rainfall

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3. Strategic initiatives for water security

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strategic initiatives



Goals for 2055

Benefits

Expansion, maintenance, and improvement of rural sanitation services

100% urban and rural sanitation systems (does not include isolated systems)	100% urban and rural drinking water coverage (does not include isolated areas)	Universal access and efficient water management
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Enabling sustainable and resilient sources of supply for human consumption and irrigation

+2,250 million m ³ /year through managed recharge of aquifers	Savings of 980 million m ³ /year through efficient irrigation (170,000 ha)	98 million m ³ /year Reuse of urban and rural wastewater	Ensuring a sustainable water balance in the country's watersheds
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Implementation of a comprehensive watershed tracking and monitoring system

100% of watersheds with Strategic Water Resource Plans	From 4,200 to 7,400 Monitoring stations (glaciers, snow, lakes, rivers, groundwater)	Participatory governance in management to ensure the sustainability of resources
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Works and measures for the protection and restoration of ecosystem services

+3.5 MM m ³ /year through recharge by Nature-Based Solutions	Conservation of ecosystems that ensures water supply and environmental resilience of the territory
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Comprehensive system of resilient infrastructure in riverbeds and ravines

+ than 120 cities Advancing Stormwater Master Plans	61 River Channel Management Plans for protection against extreme events	Integrated management and protection of the territory against water risks
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Water Security National Portfolio

5,797 Projects

\$41.2 Billion

→ \$18 billion (5,353 projects) identified in the study
→ \$23 billion (444 projects) identified subsequently



HUMAN RIGHT TO WATER AND SANITATION

1	Urban Drinking Water	355 Projects \$2.42 Trillion	3	Desalination for Human Consumption	26 Projects \$0.88 Billion
2	Rural Drinking Water	1,263 Projects \$2.23 Trillion	4	Sanitation and SSR efficiency	490 Projects \$4.63 Billion

SUSTAINABLE PRODUCTION

5	Obras de Riego	584 Projects \$5.26 Billion	7	Private Desalination	38 Projects \$20.64 Billion
6	Urban Reuse	34 Projects \$0.40 Billion	8	Rural Reuse	125 Projects \$0.49 Billion

ECOSYSTEM PROTECTION

9	Management and Oversight	398 Projects \$0.33 Billion	11	Monitoring and Tracking of the Hydrological Cycle	829 Projects \$0.66 Billion
10	Recuperación de Fuentes de Agua	136 Proyectos \$0,19 Billones			

RESILIENCE AND ADAPTATION

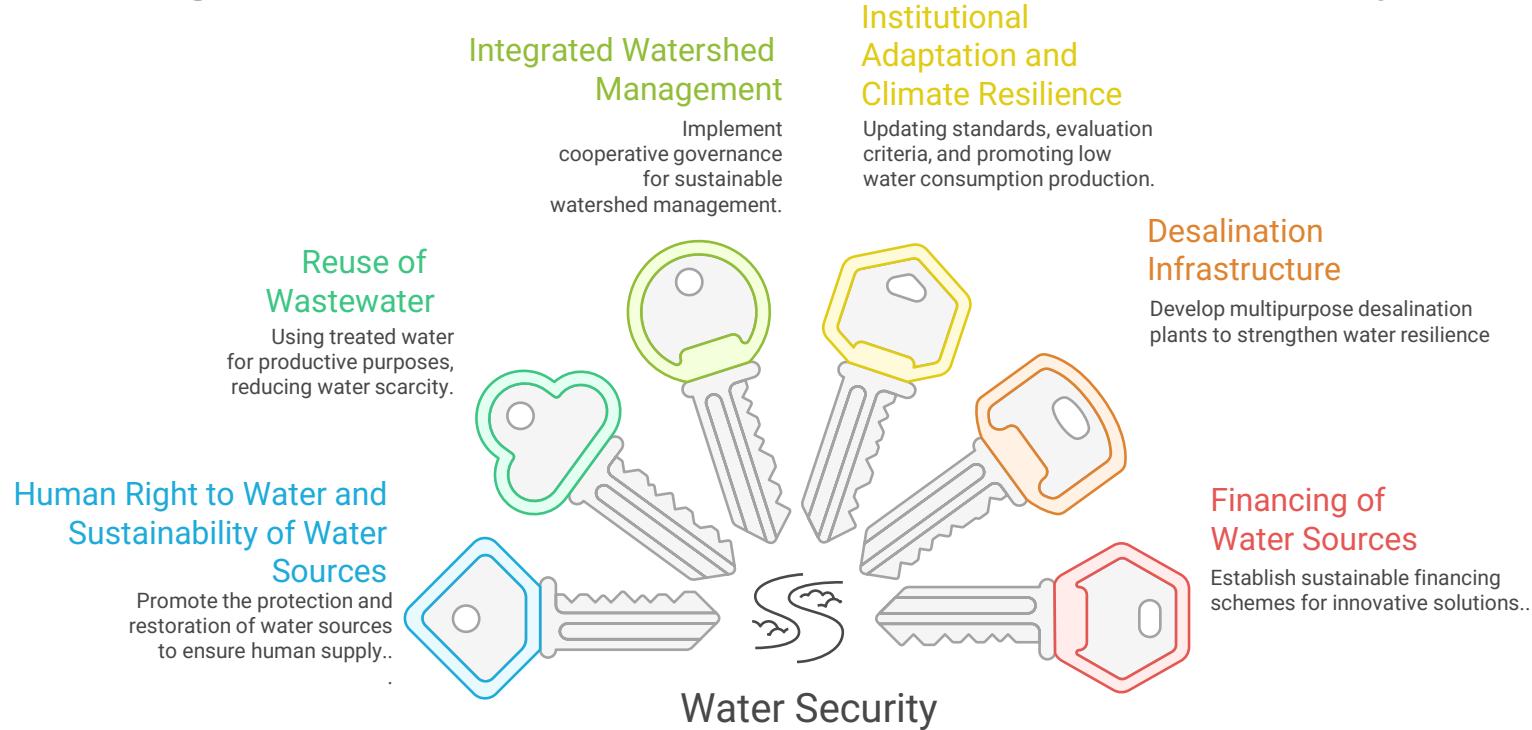
12	Plans Teachers and Studies	752 Projects \$0.34 Billion	13	Resilience	766 Projects \$2.6 Billion
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MANAGEMENT AND PUBLIC POLICY INITIATIVES

Management of Basin Organizations for the sustainability of water sources

New financing mechanisms: sources, infrastructure, and efficiency

Management Initiatives and Public Policy



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4. Conclusiones

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Conclusions

- It offers an unprecedented diagnosis of the country's water situation, through the dimensions of water security.
- Flexible and strategic planning to anticipate disruptive changes.
- Dynamic, with regular updates and multiscale sequencing.
- Synthesizes and consolidates a national roadmap aligned with a long-term strategic vision that enables the realization of new institutional competencies.
- Identify new investment projects with a watershed approach, considering the entire life cycle of the infrastructure.
- Proposes public policies to enable new investments and synergy between projects.



NATIONAL PUBLIC
INFRASTRUCTURE
PLAN
2025-2055
PROJECTING
CHILE'S **FUTURE**

An effort that goes beyond a political cycle, a roadmap for infrastructure and water management for the Chile of the future, **focusing on the well-being of the population and future generations.**



<https://infraestructura2055.mop.gob.cl/>

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