

Document of
The World Bank

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Report No: PAD1275

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF USD 40.89 MILLION

TO THE

REPUBLIC OF CHILE

FOR THE

INTEGRATED WATER RESOURCES MANAGEMENT

AND INFRASTRUCTURE DEVELOPMENT PROJECT

October 15, 2015

Water Global Practice
Latin America and the Caribbean Region

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CURRENCY EQUIVALENTS

(Exchange Rate Effective as of May 30, 2015)

Currency Unit = Chilean Peso (CLP)
CLP 618.09 = USD 1

FISCAL YEAR

January 1 – December 31

ABBREVIATIONS AND ACRONYMS

ANI	National Investment Agency (<i>Agencia Nacional de Inversión</i>)
AOP	Annual Operational Program
BP	Bank Procedures
CAS	Groundwater Users Association (<i>Comunidad de Aguas Subterráneas</i>)
CBR	Property Registrar (<i>Conservador de Bienes Raíces</i>)
CCOP	Concession Coordination Unit for Public Works (<i>Coordinación de Concesiones de Obras Públicas</i>)
CIRH	Center for Information on Water Resources (<i>Centro de Información de Recursos Hídricos</i>)
CGR	Supreme Audit Institution (<i>Contraloría General de la República de Chile</i>)
CODELCO	National Copper Corporation (<i>Corporación Nacional de Cobre</i>)
CONADI	National Commission for Indigenous Development (<i>Corporación Nacional de Desarrollo Indígena</i>)
CPA	Public Water Rights Registry (<i>Catastro Público de Aguas</i>)
CPS	Country Partnership Strategy
CQS	Selection Based on Consultant's Qualifications
DA	Designated Account
DC	Direct Contracting
DGA	Directorate-General for Water (<i>Dirección General de Aguas</i>)
DOH	Hydraulic Infrastructure Directorate (<i>Dirección de Obras Hidráulicas</i>)
DPL	Development Policy Loan
EMF	Environmental Management Framework
ENDESA	National Electricity Company (<i>Empresa Nacional de Electricidad S.A.</i>)

FA	Framework Agreement
FBS	Fixed Budget Selection
FMA	Financial Management Assessment
GIS	Geographic Information System
GP	Good Practices
GPD	Gross Domestic Product
GRS	Grievance Redress System
IBRD	International Bank for Reconstruction and Development
ICB	International Competitive Bidding
ICOLD	International Commission for Large Dams
ICT	Information and Communication Technology
IDA	International Development Association
IFAC	International Federation of Accountants
IFC	International Finance Corporation
IFR	Interim Financial Report
ISA	International Standards on Auditing
IWRM	Integrated Water Resources Management
JV	Water user organization <i>(Junta de Vigilancia)</i>
LAC	Latin America and the Caribbean
LCS	Least Cost Selection
M&E	Monitoring and Evaluation
MIDESO	Ministry of Social Development <i>(Ministerio de Desarrollo Social)</i>
MOP	Ministry of Public Works <i>(Ministerio de Obras Publicas)</i>
NCB	National Competitive Bidding
NOAA	National Oceanic and Atmospheric Administration
OECD	Organization for Economic Co-operation and Development
O&M	Operation and maintenance
ONEMI	National Office of Emergency of the Interior Ministry <i>(Oficina Nacional de Emergencia del Ministerio del Interior)</i>
OP	Operational Policy
OSITRAN	Public Transport Infrastructure Regulatory Organization <i>(Organismo Supervisor de Infraestructura de Transporte de Uso Público)</i>
QCBS	Quality and Cost Based Selection
QBS	Quality Based Selection
PGIRH	Integrated Water Resources Management Plan <i>(Plan de Gestión Integral de Recursos Hídricos)</i>
PDO	Project Development Objective
PPP	Public-Private Partnership
RPA	National Property Registry for Water <i>(Registro de Propiedad de Agua)</i>
SAFI	Financial and Contract Management System <i>(Sistema de Administración Financieray de Contratos)</i>
SAG	Agricultural and Livestock Service

	<i>(Servicio Agrícola y Ganadero)</i>
SEPA	Procurement Plan Execution System
SERNAGEOMIN	National Mining and Geology Service <i>(Servicio Nacional de Geología y Minería)</i>
SICOF	Accounting and Financial Information System <i>(Sistema de Información Contable Financiero)</i>
SNIA	National Information System for Water <i>(Sistema Nacional de Información de Agua)</i>
SSS	Single Source Selection
TAL	Technical Assistance Loan
TORs	Terms of Reference
WUO	Water Users Organization
WRM	Water Resources Management

Regional Vice President:	Jorge Familiar
Country Director:	Alberto Rodriguez
Senior Global Practice Director:	Junaid Kamal Ahmad
Practice Manager:	Wambui G. Gichuri
Task Team Leaders:	Marie-Laure Lajaunie and Javier Zuleta

**CHILE - INTEGRATED WATER RESOURCES MANAGEMENT
AND INFRASTRUCTURE DEVELOPMENT PROJECT**

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PAD DATA SHEET

Chile

CL Integrated Water Resources Management & Infrastructure Development (P152319)

PROJECT APPRAISAL DOCUMENT

LATIN AMERICA AND CARIBBEAN

WARD

Report No.: PAD1275

Basic Information			
Project ID P152319	EA Category B - Partial Assessment	Team Leader(s) Marie-Laure Lajaunie, Javier Zuleta	
Lending Instrument Investment Project Financing	Fragile and/or Capacity Constraints []		
	Financial Intermediaries []		
	Series of Projects []		
Project Implementation Start Date 16-Nov-2015	Project Implementation End Date 04-Jan-2021		
Expected Effectiveness Date 04-Jan-2016	Expected Closing Date 04-Jan-2021		
Joint IFC No			
Practice Manager Wambui G. Gichuri	Senior Global Practice Director Junaid Kamal Ahmad	Country Director Alberto Rodriguez	Regional Vice President Jorge Familiar
Borrower: Ministry of Finance			
Responsible Agency: Ministry of Public Works			
Contact: Telephone No.: 560224494000	Sergio Galilea	Title: Email: sergio.galilea@mop.gov.cl	Undersecretary of Public Works
Project Financing Data(in USD Million)			
[X] Loan	[] IDA Grant	[] Guarantee	
[] Credit	[] Grant	[] Other	
Total Project Cost:	45.17	Total Bank Financing:	40.89
Financing Gap:	0.00		

Financing Source	Amount
Borrower	4.28
International Bank for Reconstruction and Development	40.89
Total	45.17

Expected Disbursements (in USD Million)

Fiscal Year	2016	2017	2018	2019	2020	2021	0000	0000	0000	0000
Annual	5.00	7.00	11.00	12.00	5.00	0.89	0.00	0.00	0.00	0.00
Cumulative	5.00	12.00	23.00	35.00	40.00	40.89	0.00	0.00	0.00	0.00

Institutional Data

Practice Area (Lead)

Water

Contributing Practice Areas

Transport & ICT

Cross Cutting Topics

- Climate Change
- Fragile, Conflict & Violence
- Gender
- Jobs
- Public Private Partnership

Sectors / Climate Change

Sector (Maximum 5 and total % must equal 100)

Major Sector	Sector	%	Adaptation Co-benefits %	Mitigation Co-benefits %
Water, sanitation and flood protection	General water, sanitation and flood protection sector	70	10	
Public Administration, Law, and Justice	Public administration-Transportation	20	5	
Public Administration, Law, and Justice	Public administration-Water, sanitation and flood protection	10	10	
Total		100		

I certify that there is no Adaptation and Mitigation Climate Change Co-benefits information applicable to this project.

Themes		
Theme (Maximum 5 and total % must equal 100)		
Major theme	Theme	%
Environment and natural resources management	Water resource management	65
Public sector governance	Other public sector governance	15
Public sector governance	Administrative and civil service reform	10
Financial and private sector development	Infrastructure services for private sector development	10
Total		100
Proposed Development Objective(s)		
The Project Development Objective (PDO) is to strengthen the capacity of the Borrower for water resources management and public infrastructure planning and concession.		
Components		
Component Name	Cost (USD Millions)	
Component 1: Water Resources Management	33.33	
Component 2: Infrastructure Services Planning	5.52	
Component 3: Institutional Strengthening for Infrastructure Concession	2.31	
Component 4: Project Implementation	3.91	
Systematic Operations Risk- Rating Tool (SORT)		
Risk Category	Rating	
1. Political and Governance	Moderate	
2. Macroeconomic	Low	
3. Sector Strategies and Policies	Moderate	
4. Technical Design of Project or Program	Low	
5. Institutional Capacity for Implementation and Sustainability	Low	
6. Fiduciary	Moderate	
7. Environment and Social	Low	
8. Stakeholders	Moderate	
9. Other		
OVERALL	Moderate	
Compliance		
Policy		

Does the project depart from the CAS in content or in other significant respects?		Yes []	No [X]
Does the project require any waivers of Bank policies?		Yes []	No [X]
Have these been approved by Bank management?		Yes []	No [X]
Is approval for any policy waiver sought from the Board?		Yes []	No [X]
Does the project meet the Regional criteria for readiness for implementation?		Yes []	No [X]
Safeguard Policies Triggered by the Project		Yes	No
Environmental Assessment OP/BP 4.01		X	
Natural Habitats OP/BP 4.04		X	
Forests OP/BP 4.36			X
Pest Management OP 4.09			X
Physical Cultural Resources OP/BP 4.11			X
Indigenous Peoples OP/BP 4.10		X	
Involuntary Resettlement OP/BP 4.12			X
Safety of Dams OP/BP 4.37			X
Projects on International Waterways OP/BP 7.50			X
Projects in Disputed Areas OP/BP 7.60			X
Legal Covenants			
Name	Recurrent	Due Date	Frequency
Description of Covenant			
Conditions			
Source Of Fund	Name	Type	
IBRD	Operational Manual	Effectiveness	
Description of Condition			
The Operational Manual has been prepared by the Borrower through MOP, and approved by the Bank. Article 4.01 of the Financing Agreement.			
Team Composition			
Bank Staff			
Name	Role	Title	Specialization
Marie-Laure Lajaunie	Team Leader (ADM Responsible)	Lead Water Resource	Water resources management
			GWADR

		Management Specialist		
Javier Zuleta	Team Leader	Sr Water Resources Mgmt. Spec.	Water resources management	GWADR
Selene del Rocio La Vera	Procurement Specialist	Procurement Specialist	Procurement	GGODR
Patricia De la Fuente Hoyes	Financial Management Specialist	Sr Financial Management Specialist	Financial Management	GGODR
Alonso Zarzar Casis	Safeguards Specialist	Sr Social Scientist	Social	GSURR
Clementine Marie Stip	Team Member	Junior Professional Associate	Water	GWADR
Daniel Alberto Benitez	Team Member	Senior Transport Economist	Infrastructure Concessions	GTIDR
Hector Alexander Serrano	Team Member	E T Consultant	Water resources management	GWADR
Kevin McCall	Team Member	Consultant	Law and climate change	LCRVP
Lincoln Flor	Team Member	Senior Transport Economist	Infrastructure Concessions	GTIDR
Maria Virginia Hormazabal	Team Member	Finance Officer	Disbursement	WFALN
Mariana Margarita Montiel	Counsel	Senior Counsel	Lawyer	LEGLE
Pamela Sofia Duran Vinueza	Team Member	Program Assistant	Team assistant	GWADR
Raul Tolmos	Safeguards Specialist	Environmental Specialist	Environment	GENDR
Susanne M. Scheierling	Team Member	Sr. Irrigation Water Economist	Economist	GWADR

Locations

Country	First Administrative Division	Location	Planned	Actual	Comments
Chile	Santiago Metropolitan	Region Metropolitana de Santiago		X	Nivel central
Chile	Maule	Maule		X	
Chile	Coquimbo	Choapa		X	

I. STRATEGIC CONTEXT

A. Country Context

1. Chile has a solid record of economic growth, with an average rate of 5 percent per year during the last two decades.¹ In 2010, Chile was the second country in Latin America and the Caribbean (LAC) to join the Organization for Economic Co-operation and Development (OECD) as a member. Yet its per capita income, amounting to USD 21,888 in 2013, is still well below the OECD average of USD 37,879.² As one of the best performing economies in LAC, Chile has also achieved a reduction in poverty levels and an increase in shared prosperity. Income poverty fell from 29.1 percent in 2006 to 14.4 percent in 2013. Similarly, the extreme income poverty headcount fell from 12.6 percent to 4.5 percent over the same period³. In terms of shared prosperity, the average income of the bottom 40 percent increased during the period of 2003-2011 by 4.28 percent, considerably faster than the overall income growth of 2.46 percent.⁴ Nonetheless, reducing income inequality continues to be a key challenge in Chile. At 0.52, the Gini index remains high and above the average in LAC of 0.49⁵.

2. Raising the per capita incomes to OECD levels and further reducing poverty and inequality levels have been common development goals of the former and current administration. An ambitious agenda to achieve these goals was set out in the Annual Presidential Speeches of 2014⁶ and 2015⁷. In line with these goals, the Ministry of the Public Works (MOP) launched the “Agenda 30 30” in 2014, calling for a more balanced development of the country. The agenda aims for a per capita income of USD 30,000 by 2030, and levels of social inclusion and territorial equity similar to those of countries such as Italy, Slovenia or New Zealand.⁸ Reaching these goals will require boosting economic growth and increasing opportunities for all through public sector reforms, job creation and increased investment, particularly in infrastructure. It will also require strengthening social policies that target the poor and improving the management of increasingly scarce water resources.⁹

3. Up to 70% of Chile’s total exports depend on water intensive sectors such as, agriculture, agroforestry, fisheries, and mining. During the past three decades, the increased pressure from competing uses, and the shift towards a water intensive, export oriented economy, along with a heavy reliance on hydropower have led to a sharp increase in the use of water, particularly in the relatively water-poor river basins in northern and central Chile. At the same time, water availability

¹ World Bank. 2015. *Performance and Learning Review of the Country Partnership Strategy for the Republic of Chile*. Report No. 94271-CL. Washington, DC: World Bank.

² GDP per capita in purchasing power parity (PPP). See Organization for Economic Cooperation and Development (OECD). 2015. *StatExtracts*. Paris: OECD.

³ LAC Equity Lab, World Bank. 2015.

⁴ See footnote 1.

⁵ International Monetary Fund (IMF). 2015. *Regional Economic Outlook. Western Hemisphere: Northern Spring, Southern Chills*. Washington, DC: IMF.

⁶ Gobierno de Chile. 2014. *Discurso Presidencial*. 21 de Mayo de 2014. Santiago.

⁷ Gobierno de Chile. 2015. *Discurso Presidencial en el Congreso Valparaíso*. 21 de Mayo de 2015. Santiago.

⁸ Ministerio de Obras Públicas (MOP). 2014. *Hacia un país con desarrollo equilibrado: infraestructura y agua*. Santiago, Gobierno de Chile.

⁹ World Bank. 2015. *Performance and Learning Review of the Country Partnership Strategy for the Republic of Chile*. Report No. 94271-CL. Washington, DC: World Bank.

is being constrained by worsening water quality from industrial, mining and agricultural contamination, and exacerbated by the effects of climate change in some river basins. Many of these trends are expected to continue in the short and medium-term.¹⁰

B. Sectoral and Institutional Context

4. MOP plays a key role in achieving the Government's development goals. It is responsible for the management of water resources—the backbone of public well-being, environmental health and economic activity, and therefore an essential element to growth and shared prosperity. This responsibility is particularly relevant to Chile's export-oriented economy, where water-dependent sectors such as mining, agriculture, agro-forestry, and fisheries account for up to 70 percent of total exports.¹¹ MOP is also in charge of public infrastructure provision, an activity that underpins the competitiveness of most of the country's major industries and provides important services to the poor. This includes about 40 percent of total national infrastructure investments in a range of sectors, including transport, multi-purpose and irrigation dams, rural water supply, urban drainage, and public buildings. Between 2003 and 2013, MOP's infrastructure investment, including the concession investment it leveraged, amounted to USD 2.4 billion per year, equivalent to about 1 percent of the country's GDP.¹²

5. In particular, MOP's "Agenda 30 30" intends to make a significant contribution to the national development goals in the areas of infrastructure and water. A key target is to increase public, private and public-private annual investments on infrastructure from 2.5 percent to 3.5 percent of GDP. MOP's contribution for this would equal 1.9 percent of GDP, almost double its current investment level. This will require a series of short- to medium measures for boosting investments and reforming the related legal and institutional frameworks, especially in the areas of water resources management and infrastructure concessions. The legal reforms are expected to comprise changes in both institutional arrangements and regulatory instruments. In consequence, amendments to improve water resources management (Water Code of 1981) and concessions (Concession Law of 2010) are under preparation. Additionally, changes in both areas will further require amendments to the Organic Law of MOP of 1997. The reform directions are further outlined below.

6. *Water Resources Management.* To achieve its national development goals, Chile needs to respond and adapt to the growing pressures on water resources. A key challenge is to better manage water as a public good, reconciling economic efficiency with the protection of public interest. The Water Code of 1981 provides for secure and tradable property rights for water use. This has encouraged over time water-related investments and improved efficiency in water use. However, the legal arrangements limit the Government's role and power to manage the resource, particularly regarding the exercise of water use rights. Protection of the public interest is increasingly inadequate. It is therefore recommended to manage water in a more integrated way, reforming the

¹⁰ Banco Mundial. 2011. *Diagnóstico de la gestión de los recursos hídricos*. Departamento de Medio Ambiente y Desarrollo Sostenible, Región para América Latina y Caribe. Washington, DC: World Bank.

¹¹ Banco Mundial. 2015. *Marco legal para la gestión de los recursos hídricos: limitaciones y recomendaciones*. Departamento de Medio Ambiente y Desarrollo Sostenible. Región para América Latina y Caribe, World Bank, Washington, DC: World Bank.

¹² Ministerio de Obras Públicas (MOP). 2014. *Hacia un país con desarrollo equilibrado: infraestructura y agua*. Santiago, Gobierno de Chile.

institutional and legal framework for water resources, creating a stronger water authority, expanding the State functions and tools for water resources management, and increasing investments in hydraulic infrastructure and the provision of water information, as discussed in a number of documents, including in MOP's "Agenda 30 30", the National Water Resources Strategy for 2012-2015¹³, the National Water Resources Policy of 2015¹⁴ as well as analytical work carried out by the World Bank¹⁵.

7. To encourage this reform process, the Project will support strengthening the DGA at the national level and in two selected river basins (Choapa and Maule), improving water information systems and modernizing key tools necessary for the water authority to fulfill its functions, including those related to water planning, water abstractions control and dam safety. It will also help prepare the ground for the upcoming legal and institutional reforms and, when approved, will facilitate their implementation.

8. *Infrastructure Planning and Concessions.* Since joining the OECD, the Government has redoubled efforts to reduce gaps in terms of infrastructure-related quantity and quality and to address severe social and territorial inequalities. To this end, MOP's "Agenda 30 30" envisions infrastructure-related investments totaling USD 37.1 billion during the period 2014-2021, mainly in the fields of transport, dams, and coastal development. Investments of about USD 23.8 billion are expected to be carried out directly by MOP and the remaining USD 13.3 billion through concessions.

9. Success in implementing this ambitious public investment and concession program will be enhanced by the strengthening of MOP's capacity and models for infrastructure planning and concessions development and management.

10. Enhancing the institutional capacity of MOP's Planning Directorate, will help support efforts to: (i) better integrate the infrastructure developed by various Ministries, as well as that developed through public procurement and concessions, including unsolicited proposals; (ii) prioritize infrastructure investments while balancing the need to increase economic growth and

¹³ Ministerio de Obras Públicas (MOP). 2012. *Chile cuida su agua – estrategia nacional de recursos hídricos 2012-2015*. Santiago, Gobierno de Chile.

¹⁴ Ministerio del Interior y Seguridad Pública. 2015. *Política nacional para los recursos hídricos*. Santiago, Gobierno de Chile.

¹⁵ A key document was: Banco Mundial. 2011. *Diagnóstico de la gestión de los recursos hídricos*. Departamento de Medio Ambiente y Desarrollo Sostenible, Región para América Latina y Caribe. Washington, DC: World Bank. This was followed by: (a) Banco Mundial. 2012. *Evaluación de concesiones y obra pública en infraestructura - comparación de metodologías de estimación de costos y beneficios*. Washington, DC: World Bank; (b) Banco Mundial. 2012. *Tarifificación de carreteras urbanas e interurbanas - tendencias y desafíos en el manejo de la movilidad y el financiamiento de las infraestructuras viales*. Washington, DC: World Bank; (c) Banco Mundial. 2013. *Estudio para el mejoramiento del marco institucional para la gestión del agua*. Departamento de Medio Ambiente y Desarrollo Sostenible. Región para América Latina y Caribe, World Bank, Washington, DC: World Bank; (d) Banco Mundial. 2013. *Estudio para el fortalecimiento de los procesos de planeación y de priorización para el desarrollo de infraestructura hidráulica*. Departamento de Medio Ambiente y Desarrollo Sostenible. Región para América Latina y Caribe, Washington, DC: World Bank; (e) Banco Mundial. 2014. *Plan para la mejora del marco institucional del agua en Chile*. Departamento de Medio Ambiente y Desarrollo Sostenible. Región para América Latina y Caribe, Washington, DC: World Bank; and (f) Banco Mundial. 2015. *Marco legal para la gestión de los recursos hídricos: limitaciones y recomendaciones*. Departamento de Medio Ambiente y Desarrollo Sostenible. Región para América Latina y Caribe, World Bank, Washington, DC: World Bank.

improve territorial equality; (iii) increase the level of societal and consumer voice in planning; (iv) generate investment programs that are better integrated along supply chains, reducing coordination difficulties and inefficiencies; and (v) better integrate infrastructure planning with the process of decentralization and land use planning.

11. Enhancing the institutional capacity of MOP's *Concession Coordination Unit for Public Works (CCOP)* and model for concessions would be crucial to: (i) provide the appropriate checks and balances between the Concession Unit, MOP and other stakeholders; (ii) improve the quality and relevance of the concession portfolio by developing a strategic concession program that would establish the basis for project selection, and by setting up a monitoring and evaluation system that would draw lessons-learned for future programs and projects; (iii) improve the procedures for the overall concession program cycle to mitigate renegotiation risks, reduce costs, and improve confidence of the market and operators, and so that all projects follow similar criteria, practices, standard procedures and benchmarks for quality control; (iv) improve staff capacity and institutional memory, attracting and retaining talent, by improving human resources policies and implementing a solid capacity-building program and; (v) develop an information system to improve decision-making and increase transparency and credibility towards external stakeholders.

12. As part of this reform process, the Project will support MOP's Planning Directorate in strengthening its national strategic planning methodology, its overall infrastructure planning and programming model, its human resources capacity, and its planning evaluation mechanisms and knowledge management. It will also strengthen MOP's Concession Unit with support to the legal and institutional reforms, improvement in concession operating models, and human resources management and information systems.

C. Higher Level Objectives to which the Project Contributes

13. *Relationship to Country Partnership Strategy (CPS)*. The objectives of the Project are fully consistent with those set in the FY11-16 joint Bank-IFC CPS (Report No. 57989-CL), in particular strategic areas I "Public Sector Modernization" and III "Promoting Sustainable Infrastructure".

14. *Contribution to the Borrower's High-level Objectives for the Sectors and for Poverty Reduction and Shared Prosperity*. The Project is designed to support the implementation of MOP's water resources and infrastructure agenda. Thereby it will contribute to the national development goals of reaching a per capita income of USD 30,000 by 2030, and levels of social inclusion and territorial equity similar to other OECD countries. More specifically, with regard to poverty reduction and shared prosperity, the Project will contribute to: (a) increasing basin stakeholders' participation in water resources planning and management, giving a voice to the more vulnerable groups so that their concerns are better taken into account; (b) strengthening the water abstraction control program, helping to protect smaller users; (c) decreasing the vulnerability of the population living in areas at risk of dam failure, often the poor; (d) reducing territorial inequalities with regard to access to public services and infrastructure by designing territorial infrastructure inequality indices to inform infrastructure planning; and (e) improve shared prosperity through a more systematic value-for-money approach applied to infrastructure programs and project delivery, and enhanced oversight of concession contracts with a focus on transparency towards users and investors.

II. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

15. The Project Development Objective (PDO) is to strengthen the capacity of the Borrower for water resources management and public infrastructure planning and concession.

B. Project Beneficiaries

16. The main beneficiaries of the Project will comprise: (a) Government agencies with a focus on MOP and, more specifically, DGA, the Planning Directorate, and CCOP, with capacity strengthening in water resources management, infrastructure planning, and concessions, respectively; (b) water users, with a focus on those in the Choapa and Maule basins who currently are affected by prolonged droughts and increasing water scarcity and contamination; and the general public whose livelihood and assets may be affected by flood events and dam failure, involving about 735,000 inhabitants of which 20 percent are estimated to be poor; and (c) users of the various infrastructure investments planned by the Planning Directorate and partly built under concessions administered by CCOP, involving Chile's 17.6 million inhabitants of which 14 percent are estimated to be poor. The infrastructure investments range from rural water supply, transport (such as roads, harbors, airports) and dams to public buildings and parks as well as urban drainage. The concessions administered by CCOP include transport infrastructure, dams, and social infrastructure such as hospitals.

C. PDO Level Results Indicators

17. The achievement of the PDO will be monitored through the following indicators:

- (a) National Water Information System strengthened, showing an increase in data volume, ability to respond to users' requests and use;
- (b) Integrated basin-scale water resources management plans formulated and under implementation;
- (c) National Infrastructure and Water Master Plan developed, incorporating decentralization and territorial infrastructure equality policies; and
- (d) Improved operational model for MOP's concession unit implemented.

18. Details about the measurement of these indicators and their annual target values are included in the results framework of Annex 1.

III. PROJECT DESCRIPTION

A. Project Components

19. The proposed Project will have four components.

Component 1: Water Resources Management (Total Cost USD 33.33 and IBRD Loan USD 31.83 million)

20. The component will provide support for the strengthening of the Borrower's capacity for a more integrated and participatory basin-scale water resources management, through:

21. *Sub-component 1.1: Modernization of the Borrower's Institutional Framework for Water Resources Management.* The Project will support: (i) the design of a new institutional framework for water resources management; (ii) the definition of the instruments required in the implementation of the institutional design described in (i) above; (iii) the estimation of the budget impact of the new institutional framework and identification of the associated financing means; and (iv) the development of a proposal for institutional strengthening activities for DGA, and the first stages of its implementation.

22. *Sub-component 1.2: Strengthening of the Borrower's National Water Information System.* The sub-component will finance: (i) DGA's organizational strengthening for the management of the water information system; (ii) the upgrading of the water information system hardware and software; and (iii) the improvement of water data collection and transmission.

23. *Sub-component 1.3: Improvement of the Borrower's Instruments for Water Resources Management.* The sub-component will support: (i) water resources planning at national level, including: (A) the formulation of a water master plan and (B) the design of stakeholders' coordination mechanisms for the elaboration, implementation and monitoring of the plan; (ii) the development of tools for the effective application of the Water Code; and (iii) the development of tools for the improvement of dam safety.

24. *Sub-component 1.4: Improvement of Water Resources Management in Two Selected River Basins.* The sub-component will support: (i) the formulation of basin-scale integrated water resources management plans, and the establishment of stakeholders participatory mechanisms; (ii) the piloting of the strengthened tools developed under Sub-component 1.3 (ii) above; and (iii) risk evaluation, instrumentation and design of dam safety management plans for selected dams.

Component 2: Infrastructure Services Planning (Total Cost USD 5.52 million IBRD Loan USD 4.05 million)

25. The component will provide support for the consolidation of the Planning Directorate's planning tools and capacities, to allow for improved coordination with other ministries and/or public institutions involved in infrastructure, the private sector and the Borrower's regional governments, through:

26. *Sub-component 2.1: Support for the Development of the National Infrastructure and Water Master Plan.* The sub-component will provide support to develop, publish, and disseminate the Borrower's National Infrastructure and Water Master Plan and for the design of a system to monitor and evaluate its implementation.

27. *Sub-component 2.2: Development of Territorial Infrastructure Inequality Indices.* The sub-component will support the design and use of territorial infrastructure inequality indices in the infrastructure planning process.

28. *Sub-component 2.3: Strengthening of the Planning Directorate's Capacity for Planning and Knowledge Management.* The sub-component will support: (i) updating of the ministerial planning model to take into consideration the new decentralization process; (ii) developing a framework for the assessment of ministerial plans; (iii) developing a system for the consolidation and systematization of institutional knowledge and thereafter make said system available to users; and (iv) designing and implementing the first stages of a training program for MOP and Regional Governments' staff on infrastructure services planning.

Component 3: Institutional Strengthening for Infrastructure Concessions (Total Cost USD 2.31 and IBRD Loan USD 1.00 million)

29. The component aims at strengthening the capacity of CCOP, through:

30. *Sub-component 3.1: Strengthening the Regulatory Framework and Strategic Management for Concessions.* The sub-component will support: (i) the drafting of the necessary modifications to the normative, regulatory and institutional framework for infrastructure concessions; (ii) the design and implementation of a strategic and transitional management plan; and (iii) the design and implementation of a monitoring and evaluation system for the concession program.

31. *Sub-component 3.2: Improvement of CCOP's Operational Model.* The sub-component will: (i) assess and define an improved operational model for CCOP; and (ii) develop and implement the new operational processes defined in (i) above.

32. *Sub-component 3.3: Capacity Building and Information System.* The sub-component will support: (i) the strengthening of human resources and their management through the design of human resources management policies, the definition of job profiles, the identification of human resources gap and the design and implementation of the first stages of a staff training program; and (ii) the design, development and implementation of the first stages of an information system on concession Projects and of a knowledge management model.

Component 4: Project Implementation (Total Cost and IBRD Loan USD 3.91 million)

33. The component will provide support for the coordination, monitoring and evaluation of the Project, including the financing of external audits.

B. Project Financing

34. The total financing required is estimated at USD 45.17 million. An IBRD loan will finance USD 40.89 million. Table 1 provides a summary of Project cost and financing by components.

Table 1: Project Cost and Financing (USD million)

Project Components	Project Cost	IBRD	% Financing
Component 1: Water Resources Management	33.33	31.83	95.50
<i>Sub-component 1.1: Modernization of the Borrower’s Institutional Framework for Water Resources Management</i>	4.67	4.67	100.00
<i>Sub-component 1.2: Strengthening of the Borrower’s National Water Information System</i>	12.37	12.37	100.00
<i>Sub-component 1.3: Improvement of the Borrower’s Instruments for Water Resources Management</i>	8.53	7.03	82.42
<i>Sub-component 1.4: Improvement of Water Resources Management in Two Selected River Basins</i>	7.76	7.76	100.00
Component 2: Infrastructure Services Planning	5.52	4.05	73.45
<i>Sub-component 2.1: Support for the Development of the National Infrastructure and Water Master Plan</i>	2.86	1.94	68.02
<i>Sub-component 2.2: Development of Territorial Infrastructure Inequality Indices</i>	0.67	0.56	83.58
<i>Sub-component 2.3: Strengthening of the Planning Directorate’s Capacity for Planning and Knowledge Management</i>	1.99	1.55	77.81
Component 3: Institutional Strengthening for Infrastructure Concessions	2.31	1.00	43.24
<i>Sub-component 3.1: Strengthening the Regulatory Framework and Strategic Management for Concessions</i>	0.41	0.20	48.78
<i>Sub-component 3.2: Improvement of CCOP’s Operational Model</i>	0.58	0.30	51.56
<i>Sub-component 3.3: Capacity Building and Information System</i>	1.32	0.50	37.87
Component 4: Project Implementation	3.91	3.91	100.00
Total Project Costs	45.07	40.79	90.51
Front-End Fees	0.10	0.10	100.00
Total Financing Required	45.17	40.89	90.51

C. Lessons Learned and Reflected in the Project Design

35. Lessons learned reflected in the design of the Project include the following:

36. *Water Resources Planning and Stakeholders’ Participatory Entities.* International experience reveals that for water planning to be effective in orienting and coordinating public and private decisions around a common vision for water resources and their management in the basin, a stakeholders’ participation entity should be formally established to prepare the plan, to validate it, and supervise its implementation. This entity is supposed to ensure stakeholders’ ownership over and commitment to the plan, and therefore its later implementation. The absence of such formally established participation entity is one of the reasons why past basin planning experiences

in Chile were unsuccessful.¹⁶ Another lesson is that great care should be taken in the identification of the stakeholder groups and the election of the representatives of each group to foster a balanced representation of stakeholders' views and interests in order to create a legitimate participation entity.¹⁷ Representatives from the private and public sectors should be included, for example, and the composition of the groups should be tailored to the basin characteristics.

37. *Water Abstraction Control and Enforcement.* International experience has shown that command and control tools for regulating water abstractions, especially from groundwater, are often ineffective. Establishing water users' organization to promote self-control and combine it with a balanced mix of users' incentives and command and control tools has proven more successful.¹⁸ Adequate monitoring and understanding of the aquifer behavior is also key.¹⁹ The Project will, in close collaboration with Water Users Organizations and other users, work on an approach to better control illegal abstractions. This will include capacity building and water abstraction monitoring information, to be made available to the users' organizations as part of Project support.

38. *Water Information.* The existing water information system in Chile is incomplete, with a number of disaggregated parallel data systems in various services, each partially managing water data, which creates problems when a user wants to access relevant data across domains. Access to reliable water information is the basis for sound decision-making in water management²⁰ and information plays a central role as "negotiating text" where conflicts over resources or their management emerge, providing the foundation for agreements between interested parties in conflict management.²¹ The Project will increase data availability and will aggregate data from various systems from a variety of formats into a single useable dataset, based on the successful experience of the NOAA Hydrological Data System.

39. *Dam Safety.* Based on the experiences of the US Bureau of Reclamation and the Spanish National Committee on Large Dams, the Project will provide the building blocks for a modern dam safety risk management system, compatible with the country's reality. Drawing from these international experiences, the Project will start by developing a vision for dam safety in Chile and a road map that will permit the establishment of such a system within a reasonable timeframe.²²

40. *Infrastructure Concessions.* The recent international experience in the reform of concession frameworks contributed important lessons for the design of Component 3. First, the strengthening of CCOP requires a review of the overall institutional framework beyond the unit implementing concessions. This experience draws from the 2012 reform of the concession unit in Colombia (*Agencia Nacional de Inversiones, ANI*), where the World Bank was involved. On informational systems and human resources, the nature of the concession contracts require new

¹⁶ Pena, H. "Planificación de recursos hídricos y participación de interesados en Chile".

¹⁷ World Bank. 2014. *Peru-Water Resources Management Project. Mid-term Review*. Washington, DC: World Bank.

¹⁸ Garduño, H. and F. Stephen. 2010. "Sustainable Groundwater Irrigation – Approaches to Reconciling Demand with Resources." Washington, DC: GW-MATE and World Bank.

¹⁹ FAO (Food and Agriculture Organization of the United Nations). 2003. *Groundwater Management: The Search for Practical Approaches*. Rome: FAO.

²⁰ World Bank. 1993. *Water Resources Management: A World Bank Policy Paper*. Washington, DC: World Bank.

²¹ FAO (Food and Agriculture Organization of the United Nations). 2003. *Groundwater Management: The Search for Practical Approaches*. Rome: FAO.

²² Ardiles, L., D. Sanz, P. Moreno, E. Jenaro, J. Fleitz, and I. Escuder. 2011. "Risk assessment and management of 26 dams operated by the Duero River Authority in Spain." *Dam Engineering*. International Papers on Technical Excellence. Volume XXI, Issue 4.

capacities to be developed in addition to standardized processes. However, these requirements have budget implications that need to be discussed with the authorities even when the long term benefits will ultimately pay for it. Additional experience with similar Project activities includes the 2013 reform in Russia involving the State Company for Russian Highways, the toolkit for public-private partnerships (PPP) prepared for India in 2011, and a series of ongoing reforms to Peru's PPP framework.

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

41. The implementing agency will be MOP. Within MOP, the Sub-Secretariat of Public Works will be responsible for overall Project coordination, monitoring and evaluation as well as fiduciary aspects. DGA, the Planning Directorate, and CCOP will be responsible for the technical implementation of components 1, 2 and 3, respectively. This will include the preparation of related implementation and procurement plans; terms of reference (TORs) and specifications of services and goods to be contracted; participation in the evaluation committee and supervision/reception of the services and goods; and the monitoring and evaluation of the respective components, as well as the application of the relevant social and environmental safeguards. In order to carry out these roles, the Sub-Secretariat of Public Works, DGA (including its headquarters in MOP and its regional offices in the Choapa and Maule basins), the Planning Directorate and CCOP will be strengthened through the contracting of consultants, staff training, and the provision of equipment. Annex 3 provides more details about the implementation arrangements.

B. Results Monitoring and Evaluation (M&E)

42. The Sub-Secretariat of Public Works will have overall responsibility for Project monitoring and evaluation (M&E). DGA, the Planning Directorate and CCOP will be responsible for the monitoring of their respective components, passing on the information to the Sub-Secretariat of Public Works for integration and further processing. In the case of component 1, the information to measure the progress of results indicators will be collected at the local level in the pilot basins through DGA regional offices and then aggregated by DGA at central level. Most reporting on Project indicators would be made semi-annually. Under Component 4, an amount of USD 200,000 for consultancies services and operation costs is earmarked for M&E.

C. Sustainability

43. *Borrower's Commitment and Ownership.* The strengthening of the institutional and operational frameworks of DGA and CCOP have been identified by the Government as a key need (including in the Presidential message of May 21st, 2014, the National Water Resources Strategy and the National Water Resources Policy). On water resources management, the on-going multi-year drought has further strengthened Government commitment and public support for water reform. Regarding infrastructure concessions, despite the success of the concession program, the authorities and other stakeholders in the sector perceive the need to reinforce the institutional framework and endow CCOP with more resources, capacities and tools.

44. *Critical Factors to Project Sustainability and Their Integration in Project Design.* The commitment of MOP in supporting Project activities during and after implementation, is a critical factor to ensure the sustainability of Project's outcomes. The Project would ensure MOP's engagement in order to reduce the negative effects of changes in Government and/or MOP staff turn-overs (see Annex 2).

45. A higher number of qualified staff at both national and regional levels in addition to an increased number of logistical teams and means in the field, would improve DGA's capacity for water resources management and sustainability of Project results. This will positively impact the National Water Information System, water resources planning, control and enforcement and dam safety, as well as the replication of the approaches piloted in the Choapa and Maule basins in other regions of the country. The Project supports the rationale for hiring of additional staff, assessing the needs for additional staff and/or vehicles as part of the preparation process and will strive to rely as little as possible on consultants.

46. The project will support the development of a communication strategy and finance a capacity building program for CCOP staff to increase sustainability of CCOP's strengthened capacity in the area of infrastructure concession. In addition, the Project will involve stakeholders in the definition of the new requirements of the concession project cycle.

47. Changes in the institutional and legal framework to enable the creation of a Sub-Secretariat for Water Resources and a Directorate for Concessions in MOP, would improve the Government's available tools to manage water resources and infrastructure concessions. Furthermore, these would substantially increase the likelihood of sustainable Project outcomes and the scaling up of the approaches piloted in the two basins. As envisioned, the new institutions would have more budget and staff and would be equipped with better tools and more power to fulfill their mandates.

48. The institutional modernization of MOP in the areas of water resources management and infrastructure concession will require prolonged efforts beyond the implementation period of the Project. Thus the envisioned impacts of the Project activities are expected to fully materialize only in the medium- to longer term, even though a number of benefits as a result of the changes supported by the Project will already materialize in the short term.

V. KEY RISKS

49. The Project overall risk rating is moderate. Key risks that may affect the achievement of the PDO include the following:

- (a) Details of the institutional and legal reform for water resources management are still under consideration. The 2015 National Water Resources Policy²³ further mentions that DGA needs to be strengthened until the new institutional framework is implemented. This is where the Project would provide key contributions. The risk that the future water authority will not be part of MOP is low, but its potential impacts on Project performance are high. To mitigate this risk, the Project team will follow closely the

²³ Ministerio del Interior y Seguridad Publica. 2015. *Política nacional para los recursos hídricos*. Santiago, Gobierno de Chile.

legal reform process during implementation and will restructure the Project if necessary.

- (b) Details of the institutional and legal reform for infrastructure concessions are still under consideration. The planned law to create a new Concession Directorate under MOP may be approved during Project implementation. However, the resulting risk to the Project is considered moderate. As a mitigating measure, Component 3 was designed to reach its objectives in both scenarios, with or without the reform.
- (c) Staff changes in MOP, including at the Minister level and/or rotation of senior officials in DGA, the Planning Directorate or CCOP could affect ownership in the Project and therefore Project implementation. This risk is likely, but its potential impact on Project performance is considered moderate.
- (d) Based on the Financial Management and Procurement Capacity Assessments carried out by the Bank, the financial management and procurement risks are considered moderate. As mitigating measures, the Project is financing the strengthening of the implementation unit in both financial management and procurement.

50. The above mentioned risks could result in delayed disbursements and cancellations of loan amounts. However, the activities planned under the Project have been carefully aligned with client priorities and therefore the overall risk is considered moderate.

VI. APPRAISAL SUMMARY

A. Economic and Financial (if applicable) Analysis

51. With the Project aiming to strengthen MOP's capacity in water resources management and infrastructure planning and concession by supporting institutional reform processes in these areas, it is difficult to quantify the expected economic and/or financial benefits and compare them with the costs associated with the Project activities, given the methodological problems posed by the assessment of such investments and the availability of data. Below an attempt is made to provide a qualitative benefit assessment for different activities under each of the three components.

52. Component 1 is designed to help protect the public interest in water resources management. More integrated and participatory water resources planning and better control and enforcement of the Water Code are expected to: (i) reduce overexploitation of water resources and also decrease third-party effects and other externalities that increasingly affect the security (in hydrologic terms) of the water rights; this will help avoid a reduction in returns of past water-related investments, and facilitate future investments; (ii) decrease the likelihood that vulnerable groups are affected by the uncontrolled water use of others; and (iii) reduce further environmental damage. Similarly, activities on dam safety will have economic, social and environmental benefits by reducing the likelihood of possibly disastrous dam failures. To successfully implement improvements in these measures, support is provided for better water information systems and a stronger DGA with more resources, power and autonomy.

53. The investments under Component 2 for infrastructure planning are small compared to infrastructure investments planned under the “Agenda 30 30” for the period 2014-21, which amount to USD 37.1 billion for MOP alone (both through direct involvement and concessions). The activities related to the National Infrastructure and Water Master Plan are expected to improve the quality, relevance and timing of the investment program—not only for the investments involving MOP but also other Ministries and concessions. This should lead to a better coordination of the different Government agencies involved, and to an increased efficiency of infrastructure investment and better services. The development and application of innovative territorial equity indices will help justify investments in parts of the country that in the past have been relatively neglected, taking into account various criteria, and contribute to a more balanced development. To successfully implement these measures, support is provided for better information systems and staff capacity.

54. Similar to Component 2, the investments under Component 3 for strengthened infrastructure concession are small compared to the size of the concession program expected to be provided during the period 2014-2021, amounting to USD 13.3 billion for MOP alone. The activities are expected to lead to improvements in the framework and operational model for concessions—not only for concessions involving MOP but also other Ministries. This will help MOP apply more standardized processes and deliver a bigger concession program that will increasingly tackle more complex sectors, such as health. To successfully implement these measures, support is provided for better information systems and staff capacity.

B. Technical

55. As discussed in Section I, a key goal of MOP’s “Agenda 30 30” is for Chile to reach by 2030 a per capita income of USD 30,000 as well as levels of social inclusion and territorial equity similar to those of other OECD countries such as Italy, New Zealand and Slovenia. The Project will support this agenda in three key areas: water resources management, infrastructure planning, and concessions.

56. *Water Resources Management.* The Project will support the strengthening of DGA and prepare the ground for the upcoming institutional and legal reform. It will also design and pilot improved instruments for integrated water resources management that, if successfully applied, could help pave the way for a revision of the Water Code. These instruments include:

- (a) Water planning, both at national and basin levels, combined with formal structures and mechanisms for stakeholders’ participation that will more effectively coordinate the actions of the various public and private stakeholders towards a common vision. This will also include the prioritization of hydraulic infrastructure investments mentioned in the “Agenda 30 30” and the National Water Resources Policy, as well as of various non-structural interventions required for more integrated water resources management.
- (b) Water use control and enforcement system, with a special attention to groundwater abstractions in over-exploited aquifers. This would help address the current situation wherein control of water abstraction by the State is very limited, and avoid potentially damaging effects on third-parties, especially the poor, and the environment.

- (c) Dam safety management, an area that so far has not received much attention despite the high risks associated with the seismic and volcanic activity in many parts of the country, the large share of dams constructed and managed by the private sector, including irrigators, the very short river basins, and aging dam infrastructure. The building blocks of a modern dam safety risk management system would be put in place, preparing the ground for institutional and legal reform to strengthen the role of the State in this area. These activities will be important considering the program on new dams that the Government is launching to combat drought and systemic water scarcity.

57. The Project would also help strengthen the National Water Information System which is key for sound decision making with regards to the instruments above, but also for water rights administration, the functioning of the water market and, more generally, integrated water resources management.

58. *Infrastructure Concessions.* The Project will strengthen the concession unit and model to reduce the infrastructure gap and increase transparency. It will include support at three levels:

- (a) Structural and strategic. The Project will support some activities aimed at strengthening the regulatory framework and strategic management for concessions, including: (i) the provision of support for the drafting of the necessary modifications to the normative, regulatory and institutional framework for infrastructure concessions; (ii) the design and implementation of a strategic and transitional management plan; and (iii) the design and implementation of a monitoring and evaluation system for the concession program that will serve to improve its overall quality and relevance and contribute to draw lessons and best practices for future programs and projects.
- (b) Functional and operational. The Project will improve the procedures for the overall concession project cycle so that all projects follow similar criteria, practices, standard procedures and benchmarks for quality control. This will mitigate renegotiation risks, reduce costs, and improve confidence of the market and operators.
- (c) Capacity building and information system. The Project will prepare a human resources management strategy to attract and retain talent for the concession unit and will improve the information system to improve decision-making and to increase transparency and credibility towards external stakeholders.

C. Financial Management

59. The Accounting and Finance Department of MOP's Sub-Secretariat of Public Works will be responsible for the Project financial management, including the following tasks: (a) preparing the Project's annual budget and operational plan; (b) managing a local currency bank account where funds transferred from the Designated Account (DA) would be deposited; (c) managing procurement and contracting processes; (d) processing and recording Project transactions in the Financial and Contract Management System (SAFI); (e) preparing financial statements for the Project; and (f) coordinating the annual financial audit reviews.

60. Annex 3 provides more details on the Project Financial Management Arrangements, the Accounting and Finance Department's capacity assessment and its strengthening needs for Project implementation.

D. Procurement

61. Procurement under the Project will be carried out in accordance with the World Bank's *Guidelines: Procurement under IBRD Loans and IDA Credits* of January 2011, revised July 2014; *Guidelines: Selection and Employment of Consultants by World Bank Borrowers* of January 2011, revised July 2014; and the provisions stipulated in the Loan agreement. The Chilean procurement procedures (*ChileCompra*) may apply for consulting services below or equal to USD 300,000 (only in the case of firms) and for goods and non-consulting services below or equal to USD 350,000. Above those thresholds, and in the case of individual consultants and for direct contracting, the World Bank's Guidelines would apply. For each contract to be financed by the Loan, the different procurement methods or consultant selection methods, estimated costs, prior review requirements and time frame are agreed between the Borrower and the Bank in the Procurement Plan. The Borrower, through the Sub-Secretariat of Public Works, has prepared a Preliminary Procurement Plan for the entire scope of the Project, and a detailed and comprehensive procurement plan, that includes all contracts for which bid invitations and invitations for proposals are to be issued in the first 18 months of Project implementation.

62. The procurement activities will be carried out by the Sub-Secretariat of Public Works with technical input from DGA, the Planning Directorate and CCOP. A Procurement Capacity Assessment was carried out to evaluate the adequacy of the proposed procurement management arrangements for the implementation of the Project. Annex 3 provides more details on the Project Procurement Arrangements, the Sub-Secretariat's Procurement Capacity Assessment and its strengthening needs for Project implementation.

E. Social (including Safeguards)

63. The social outcomes of the Project are expected to be positive. Among the notable benefits will be the increased participation of stakeholders in water resources management, resulting in a more equitable and transparent decision-making process, and the development of new territorial infrastructure inequality indices that can be applied to close the infrastructure gap in underserved areas of the country.

64. The World Bank's Operational Policy (OP) 4.10 on Indigenous Peoples is triggered as a precautionary measure and in relation with the river basin water resources planning activities. The Borrower, through the National Commission for Indigenous Development (CONADI), did not identify any indigenous communities in the basins of Choapa and Maule. Instead, it identified ten indigenous associations, two in the Choapa and eight in the Maule river basins. According to Law 19253 of 1993 that aims to promote and protect the indigenous peoples of Chile, indigenous associations are defined as groups of individuals not smaller than 25 members that are created to reach a common goal related to cultural, educational or economic activities. The Law explicitly states that indigenous associations do not replace, nor represent the indigenous communities of Chile. The Policy is triggered because the information on the indigenous associations in the Choapa and Maule basins gathered so far is partial. It indicates that the associations are diverse –

with some of them women's associations, and others devoted to spiritual purposes, environmental objectives, or cultural revitalization goals – but is insufficient to ascertain that none of those associations has the characteristics of an indigenous community as defined by the Bank OP 4.10.

65. In order to comply with Bank Policies, and in accordance with the Guidelines on the application of safeguards to technical assistance activities in Bank-financed projects dated January 2014, the Borrower will include the principles of OP 4.10 related to social assessment, stakeholder engagement, meaningful consultation and information disclosure, in a manner satisfactory to the Bank, into the TORs of the basin-scale water resources management plans to be carried out under the Project in the Choapa and Maule basins. The task team's social specialist will provide training to project implementers, review the TORs and their adequate implementation.

F. Environment (including Safeguards)

66. Based on the environmental and social screening conducted as per OP 4.01, the Project is classified Category B, and the following safeguards apply to the preparation of the Basin plans: Environmental Assessment (OP/BP/GP 4.01) and Natural Habitats (OP/BP/GP 4.04). In accordance with the Guidelines on the application of safeguards to technical assistance activities in Bank-financed projects dated January 2014, TORs for the formulation of the plans will incorporate the principles of these Policies in a manner satisfactory to the Bank.

67. Overall, the Project is expected to have positive environmental effects by improving the management of water resources, including by better safeguarding environmental water needs in terms of quantity and quality – at the national level and especially in the two basins of Choapa and Maule. This will be achieved by (i) strengthening the National Water Information System for better decision making; and (ii) strengthening MOP's capacity for (a) water resources planning at national and basin levels, taking into account environmental considerations; and (b) the control and enforcement of water abstractions, including regarding environmental flows. However, the Project will finance the preparation of water resources and public infrastructure plans that may prioritize projects and/or activities (which will not be financed by the Project) that, once implemented, may have positive, neutral or negative impacts on the environment. In order to ensure conformity with this policy, the methodology/TORs for the plans will include specific reference to understanding and identifying environmental risks, and will follow rigorous consultation processes with relevant stakeholders. The task team's environment specialist will provide training to project implementers, review the ToR and monitor their adequate implementation.

68. OP 4.37 is not triggered because the Project does not finance the construction of new dams, nor the rehabilitation or alteration of existing dams. Moreover, it does not rely on the performance of existing dams or dams under construction to achieve its objectives and targets. Nevertheless to ensure that no negative impacts result from the technical assistance tasks, the activities related to: (i) the development of tools for the improvement of dam safety under Subcomponent 1.3 of the Project, and (iix) the preparation of the risk evaluation, instrumentation and design of dam safety management plans for the Selected Dams under Subcomponent 1.4 of the Project shall be performed in accordance with the TORs agreed upon with the Bank and in compliance with the Bank's applicable safeguard policies, including on dam safety.

G. World Bank Grievance Redress

69. Communities and individuals who believe that they are adversely affected by a World Bank supported project may submit complaints to existing project-level grievance redress mechanisms or the World Bank's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the World Bank's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of World Bank non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's GRS, please visit <http://www.worldbank.org/GRS>. For information on how to submit complaints to the World Bank's Inspection Panel, please visit www.inspectionpanel.org.

Annex 1: Results Framework and Monitoring

Country: Chile

Project Name: CL Integrated Water Resources Management & Infrastructure Development (P152319)

Results Framework

Project Development Objectives

PDO Statement

The Project Development Objective (PDO) is to strengthen the capacity of the Borrower for water resources management and public infrastructure planning and concession.

These results are at | Project Level

Project Development Objective Indicators

Indicator Name	Baseline	Cumulative Target Values					
		YR1	YR2	YR3	YR4	YR5	End Target
A. National Water Information System strengthened, showing an increase in data volume, ability to respond to users' requests and use. (Percentage)	0.00	5.00	7.00	10.00	12.00	15.00	15.00
B. Number of integrated basin-scale water resources management plans formulated and under implementation. (Number)	0.00	0.00	0.00	1.00	2.00	2.00	2.00
C. National Infrastructure and Water Master Plan developed, incorporating decentralization and territorial infrastructure equality policies. (Text)	No	Methodology for the formulation of the National Infrastructure	Territorial infrastructure inequality indices developed	Yes	Yes	Yes	Yes

		and Water Master Plan incorporates decentralization and territorial equality policies					
D. Improved operational model for MOP's concessions unit implemented (Text)	No	New operational model defined	Operational model under implementation	Operational model being used for 20% of the new contracts	Operational model being used for 50% of the new contracts	Operational model being used for 100% of the new contracts	Operational model being used for 100% of the new contracts

Intermediate Results Indicators

Indicator Name	Baseline	Cumulative Target Values					
		YR1	YR2	YR3	YR4	YR5	End Target
Architecture of the SNIA updated to reflect new information demands. (Yes/No)	No	Yes	Yes	Yes	Yes	Yes	Yes
Proposal for the optimization of the national hydro-meteorological observation network. (Yes/No)	No	No	Yes	Yes	Yes	Yes	Yes
Number of stakeholders coordination mechanisms established in the pilot basins. (Number)	0.00	0.00	0.00	1.00	2.00	2.00	2.00
Increase in the percentage of executed inspections for water abstraction in the two pilot basins. (Percentage)	0.00	30.00	50.00	70.00	90.00	90.00	90.00
National dam safety information platform operational. (Text)	No	No	No	Platform design complete, including the	National dam inventory updated and	Technical information for highest risk dams	Yes

				database structure and the user interface software	uploaded in the platform	gathered and uploaded in the platform	
Territorial Infrastructure Inequality Indices created and used to prepare infrastructure equality policies. (Text)	No	Methodology for the calculation of the Territorial Infrastructure Inequality Indices developed		Territorial Infrastructure Inequality Indices calculated at the sub-national level	Territorial Infrastructure Inequality Indices used as a tool for the prioritization of infrastructure projects		Yes
The Planning Directorate's knowledge management platform is operational. (Text)	No	No	No	Knowledge management platform designed	Knowledge management platform implemented	Yes	Yes
Proposals to modify the normative and regulatory framework for infrastructure concessions (i.e., <i>Reglamento Ley de Concesiones</i>) developed. (Text)	No normative and regulatory framework updated				Proposals to modify the normative and regulatory framework for infrastructure concessions prepared		Proposals to modify the normative and regulatory framework for infrastructure concessions prepared
Information system for concession projects implemented. (Text)	None		System designed and main components defined	System developed	System being implemented	System operational	System operational

Indicator Description

Project Development Objective Indicators

Indicator Name	Description (indicator definition etc.)	Frequency	Data Source / Methodology	Responsibility for Data Collection
A. National Water Information System strengthened, showing an increase in data volume, ability to respond to users' requests and use.	<p>The indicator will be calculated using a simple average of the following three variables:</p> <ul style="list-style-type: none"> - The percentage increase in the number of hydrological and water rights data that are stored in the system; - The percentage decrease in the response time to users' demands to the SNIA; and - The percentage increase in the number of information requests made to the system. 	Every 6 months	DGA -SNIA	DGA
B. Number of integrated basin-scale water resources management plans formulated and under implementation.	This indicator will measure the number of integrated basin-scale water resources management plans financed by the project that are formulated and under implementation.	Every 6 months	DGA	DGA
C. National Infrastructure and Water Master Plan developed, incorporating decentralization and territorial infrastructure equality policies.	<p>The National Infrastructure and Water Plan will be developed to include decentralization and territorial infrastructure equality policies. The progress of this indicator will be monitored through:</p> <ul style="list-style-type: none"> - The preparation of the methodology for the formulation of the National Infrastructure and Water Plan, which will incorporate decentralization and territorial equality policies and the preparation of baseline studies. - The development of territorial infrastructure inequality indices. 	Every 6 months	The Planning Directorate	The Planning Directorate
D. Improved operational model for MOP's concessions unit implemented.	The improved operational model includes the redefinition of processes and rules for the preparation and development of concessions projects and for the management of contracts. This will be applied to all new concessions contracts. This	Every 6 months	CCOP	CCOP

	indicator will be measured through the percentage of new contracts that use the new management procedures as defined in the new operational model.			
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Intermediate Results Indicators

Indicator Name	Description (indicator definition etc.)	Frequency	Data Source / Methodology	Responsibility for Data Collection
Architecture of the SNIA updated to reflect new information demands.	This consists in updating the structure of the SNIA, including: the definition of information demands, update of the protocols for information transmission, storage and analysis, and the definition of the new hardware and software requirements.	Every 6 months	DGA	DGA
Proposal for the optimization of the national hydro-meteorological observation network.	This indicator will measure the assessment and optimization proposal for the national hydro-meteorological observation network.	Every 6 months	DGA	DGA
Number of stakeholders coordination mechanisms established in the pilot basins.	This indicator measures the number of committees composed of a balanced representation of basin stakeholders established in the pilot basins.	Every 6 months	DGA Regional Units	DGA
Increase in the percentage of executed inspections for water abstraction in the two pilot basins.	This indicator refers specifically to those inspections for water abstraction that do not respond to a user complaint but rather are programmed by the DGA.	Every 6 months	DGA Enforcement and Control Unit	DGA
National dam safety information platform operational.	This indicator will monitor the progress of the activities related to dam safety through the completion of the following steps: - Information platform design completed, including the database structure and the user interface software; - National dam inventory updated and uploaded in the platform; and	Every 6 months	DGA	DGA

	- Technical information for highest risk dams gathered and uploaded in the platform			
Territorial Infrastructure Inequality Indices created and used to prepare infrastructure equality policies.	This indicator will be assessed through the completion of the following activities: - Methodology for the calculation of the Territorial Infrastructure Inequality Indices developed - Territorial Infrastructure Inequality Indices calculated at the sub-national level; and - Territorial Infrastructure Inequality Indices used as a tool for the prioritization of infrastructure projects.	Every 6 months	The Planning Directorate	The Planning Directorate
The Planning Directorate's knowledge management platform is operational.	This indicator will be monitored through the completion of the following activities: - Knowledge platform designed; and - Knowledge platform implemented.	Every 6 months	The Planning Directorate	The Planning Directorate
Proposals to modify the normative and regulatory framework for infrastructure concessions (i.e., <i>Reglamento Ley de Concesiones</i>) developed.	As part of the project, support will be provided for the drafting of a new regulatory framework for infrastructure concessions.	Every 6 months	CCOP	CCOP
Information system for concession projects implemented.	This indicator will be measured in four steps: information system designed; information system developed; information system being implemented; and information system operational.	Every 6 months	CCOP	CCOP

Annex 2: Detailed Project Description

CHILE: Integrated Water Resources Management & Infrastructure Development Project

1. This annex provides a detailed description of the components of the Project and their respective sub-components. This comprises Component 1 on Water Resources Management with the areas “*Modernization of the Borrower’s Institutional Framework for Water Resources Management*” (Sub-component 1.1), “Strengthening of the National Water Information System” (Sub-component 1.2), and “Improvements of the Instruments for Water Resources Management”—to be implemented at the national level (Sub-component 1.3) and at the level of two river basins, Choapa and Maule (Sub-component 1.4). Among the instruments are water planning, water use control and enforcement, and dam safety measures. Furthermore, it comprises Component 2 on Infrastructure Services Planning, and Component 3 on Institutional Strengthening for Infrastructure Concession.

Component 1: Water Resources Management

2. The component will provide support for the strengthening of the Borrower’s capacity for a more integrated and participatory basin-scale water resources management, through:

Sub-component 1.1: Modernization of the Borrower’s Institutional Framework for Water Resources Management

3. The sub-component will improve the Ministry of Public Works’ capacity at the central and basin levels by supporting the design and implementation of a new institutional framework for water resources management and the strengthening of DGA. More specifically, the Project will support: (i) the design of a new institutional framework for water resources management at national, regional and basin levels; (ii) the definition of the instruments required in the implementation of the institutional design described in (i) above; (iii) the estimation of the budget impact of the new institutional framework and identification of the associated financing means, from the national budget and other sources; and (iv) the development of a proposal for institutional strengthening activities for DGA, and the first stages of its implementation..

Sub-component 1.2: Strengthening of the Borrower’s National Water Information System

4. The sub-component will strengthen the National Water Information System (*Sistema Nacional de Información de Agua*, SNIA) to take into account the growing and changing information demands within the DGA and from external users. More specifically, the Project will finance:

- i) DGA’s organizational strengthening for the management of the water information system, including:

- a) Proposals to improve DGA's business architecture²⁴ to better meet current information needs and those resulting from the reform supported by sub-component 1.1.; and
 - b) Proposals to modify the decree defining the Public Water Rights Registry (*Catastro Público de Aguas*, CPA).
- ii) The upgrading of the SNIA hardware and software, through:
- a) Core hardware and software upgrading: upgrade of the SNIA data processing center and its link to the Ministerial data center; improvement of the SNIA communication infrastructure (hardware); purchase of licenses to operate the SNIA (software); configuration of the hardware and software of the SNIA; and annual service contract to maintain the SNIA.
 - b) Information applications : development of an information module for water rights administration within SNIA; migration of the current system for water rights administration to the SNIA; migration of the current water rights documental archive to the SNIA; design of a data management protocol and interface for the on-line reception of water rights transactions information from the notaries (*Conservadores de Bienes Raíces*) and its implementation in the two selected basins; development of an information module for the control and monitoring of the payment for no-use of water rights; improvement of the information module for on-line data reception (hydrometeorological data, hydrometric data, water abstraction data and water quality data); expansion of the information module for the control of groundwater abstraction to allow the control of surface water use and the on-line reception of data; development of a water information portal as an entry point to access public DGA data and its various information modules and; the development of an integrated and graphic decision-support platform based on a GIS application.
- iii) The improvement of water data collection and transmission through:
- a) Proposal for optimizing the surface water and groundwater quantity and quality observation networks (including data transmission) at national level and in particular for the two selected basins, Choapa and Maule;
 - b) The strengthening of the hydrometric network in Choapa and Maule;
 - c) The digitalization of the historic hydrological information; and
 - d) The updating of the information on water rights created by the *Conservadores de Bienes Raíces*, *Servicio Agrícola y Ganadero* (SAG) and the Justice Courts in the two selected basins of Choapa and Maule.

²⁴ The business architecture includes the functions, processes, systems, technologies, data and resources used by DGA to meet information needs.

Sub-component 1.3: Improvement of the Borrower's Instruments for Water Resources Management

5. The sub-component 1.3 will finance: (i) water resources planning at national level; (ii) the development of tools for the effective application of the Water Code; and (iii) the development of tools for the improvement of dam safety.

(i) Water Planning at National Level

6. The sub-component 1.3(i) will support: (a) the development of a conceptual and methodological framework for the National Water Resources Plan; (b) the design and implementation of stakeholders' coordination mechanisms required for the formulation; implementation, monitoring and evaluation of the Plan; (c) the preparation of the plan and the promotion of its implementation; and (d) proposals to modify the legal or regulatory framework to facilitate its preparation and implementation.

7. *Conceptual and Methodological Framework.* While the details of the framework will be developed under the activity, some preliminary elements are presented below.

8. The National Water Resources Plan is envisioned as a strategic instrument aimed at orienting and coordinating national policies, plans and programs that are directly or indirectly related to water around a common long- and medium-term vision for water resources. It would establish a roadmap towards the solution of the critical water related issues at the national scale. The Plan would therefore not only propose and justify specific national water resources policies and programs; but also influence/orient the design and application of sectorial and regional policies, plans and programs in order to reach a common vision. More specifically, the national plan would:

- a) Define the issues related to water resources and its management of national importance; and propose a medium-long term vision for water resources and its management, taking into account possible impacts of climate change in water resources;
- b) Orient sectorial public policies, directly or indirectly related to water, around a common vision;
- c) Establish the principles for coordination of relevant public institutions, developing synergies and reducing redundancies and conflicts;
- d) Identify the proposals for legal and normative changes, required for reaching the vision;
- e) Propose the adjustments to the sectorial objectives related to the water resources vision;

- f) Establish the criteria and methodologies for the economic, social and environmental analysis of the programs, projects and policies related to water resources;
- g) Establish the principles, criteria and procedures for participation in water management and define potential areas for public-private partnerships;
- h) Establish the general framework for financial and human resources requirements for medium- and long-term water management, and identify financing sources;
- i) Inform the general public on Government actions in the medium and longer terms, in order to orient the decision making of the private sector; and
- j) Develop a Monitoring & Evaluation framework for the plan.

9. In order to take into account the highly diverse geography of Chile, most analysis and proposals included in the National Water Resources Plan would be made at the level of macro-areas that group river basins or regions with similar characteristics and/or water related issues.

10. The planning horizon would be 25 years, taking into account the time it takes to develop large hydraulic infrastructure projects, and to modify the institutional and legal framework as well as to perceive substantial changes in the socio-economic context.

11. *Organizational Structure and Coordination Mechanisms.* The activity will support the design and implement an organizational structure to formulate the National Water Resources Plan, and encourage, monitor and evaluate its implementation. The success of the plan will depend on the proper design and functioning of this structure. Its design could be envisioned as follows:

- a) It may be structured along the lines of the current Ministerial Committee for Water Resources - composed of the Ministers of environment, public works, agriculture, energy, mining and the Presidential Delegate for Water Resources. The Minister of Public Works (MOP) would preside over the committee and the Director of DGA would serve as executive secretary. The role of the Committee would be to orient the technical work; guarantee the collaboration of the participating institutions; discuss, propose and approve the Plan and encourage, monitor and evaluate its implementation. Ideally the Committee would be based on a formal agreement between the various institutions that will be part of it, with the agreement specifying the institutions' respective commitments to support the formulation and implementation of the Plan, as well as the Committee's functions and operational rules.
- b) An Inter-institutional Technical Group would be composed of the professionals of each participating institution that coordinate the inputs of the institutions in the formulation of the Plan. The technical group would be presided by the Coordinator of the National Plan, and would be supported in its function by a technical secretariat, both financed by the Project.

- c) A Technical Secretariat would be in charge of the formulation and supervision of the plan. Its members would include about highly qualified professionals financed by the Project during the formulation of the Plan, and additional team thereafter to encourage, monitor and evaluate its implementation. More specifically, the Technical Secretariat would: (i) support the creation and functioning of the Ministerial Committee; (ii) prepare the conceptual framework and methodology for the preparation of the Plan to be approved by the Ministerial Committee; (iii) prepare the TORs for the studies that will serve as technical input to the Plan, and supervise the studies; (iv) organize workshops with different stakeholders to provide inputs to the diagnostic and proposals; (v) prepare a proposal of the Plan and send it for review by the Technical Group, and later for review and final approval to the Ministerial Committee; (vi) disseminate the Plan within government institutions; stakeholders representatives, and the public; and (vii) monitor the implementation of the Plan, including the achievements of its objectives and targets, and report progress to the Ministerial Committee on a regular basis.

(ii) Effective application of the Water Code

12. Sub-component 1.3(ii) would support the development of tools for the control and enforcement of water abstractions (i.e., water withdrawals without a water right or in excess of the amount specified in the water title), and enforcement of the payments for no-use (*patente por no uso*).

13. *Control of Illegal Abstractions and Use in Excess of Water Right Allocation.* Under Sub-component 1.3(ii), the following activities are to be supported at national level:

- a) Identification of alternative methodologies for locating illegal users (or over-uses) of ground- and/or surface water (the testing of this methodology in the two river basins of Choapa and Maule is included under sub-component 1.4(ii));
- b) Design of an abstraction monitoring network at national level and, in more details, in the two selected basins;
- c) Modification of the Software for Control of Groundwater Abstraction to (i) incorporate a module focused on surface water abstraction control and (ii) integrate GPRS as well as satellite data into the software. The web platform will comprise tools to support control and enforcement of water abstraction, such as instances where users failed to enter information or where over-extraction occurred. Once the software is finally developed, the Project will finance the maintenance and upgrading contract. (The cost of this activity is included in the Information System sub-component 1.2.)

14. *Enforcement of Payments for No-Use.* The Project will support the development of a software (information module of the SNIA) to improve data storage and processing as well as facilitate the preparation of the list of water right holders subject to the penalty for no-use every year (the cost of this activity is included in the information system component);

15. *Control and Enforcement of Water User Organizations.* The Project will finance a study to develop a methodology to investigate breaches or abuses by directorates or administrators of water user organizations related to improper water distribution and financial mismanagement (Articles 283 and 291, Water Code).

(iii) Improvement of Dam Safety

16. Sub-component 1.3(iii) would support activities to strengthen DGA's capacity in dam safety management by developing technical and regulatory tools (those tools would be tested in three pilot dams under Sub-component 1.4).

17. *Strengthening the Regulatory Framework for Dam Safety Management.* This would include:

- a) Elaboration of a national vision and policy on dam safety management to 2030;
- b) Proposals of modifications to the Water Code and the 2008 Reservoir Operational Law to implement the vision and policy;
- c) Preparation of technical manuals on seismic activity, flooding and other risks related to dam safety; and
- d) Preparation of technical guidelines based on international good practices on: identifying potential failure modes and their implications for surveillance, control, operation and emergencies; establishing a risk classification; elaborating emergency plans for their mitigation; defining operating rules; preparing behavior reports; and preparing safety evaluations by dam operators.

18. *Strengthening the Institutional Capacity for Dam Safety Management.* This would include:

- a) Definition of the functions, organizational structure and human resources needs of a unit within MOP to be responsible for dam safety management country-wide; and
- b) Design and implementation of technical training on dam safety for MOP personnel, with the participation of international experts.

19. *Developing Dam Safety Management Tools.* This would include:

- a) Improving the structure of the existing dam safety inventory, including characteristics for infrastructure risk analysis;
- b) Updating the country's dam inventory according to (i) above; and
- c) Development of a software to systematize the basic information needed for dam safety management.

Sub-component 1.4: Improvement of Water Resources Management in Two Selected River Basins

20. The sub-component will support the improvement of water resources management in two Selected River Basin (the Choapa and Maule basins), through the implementation of the tools developed under sub-component 1.3. More specifically, the Project will support: (i) the formulation of basin-scale integrated water resources management plans (*Plan de Gestión Integral de Recursos Hidricos*, PGIRHs), and the establishment of stakeholders coordination mechanisms; (ii) the piloting of the strengthened control and enforcement system; and (iii) risk evaluation, instrumentation and design of dam safety management plans for Selected Dams.

(i) Basin-Scale Integrated Water Resources Management Plans

21. The activity will support: (a) the development of a conceptual and methodological framework for the participatory, basin-scale integrated water resources management plans; (b) the design and implementation of the organizational structure and participation mechanisms required for the formulation, implementation, monitoring and evaluation of the plans for the basins of Choapa and Maule; (c) the preparation, promotion and monitoring of the two basin-scale plans, (the preparation of these plans will be based on modelling tools that will use the data being improved as a result of the strengthening of the information system); and (d) propose modifications of the legal framework to facilitate the implementation of the basin-level plans.

22. Similar to the national level, for the planning process to be effective at the basin-scale both the plan as well as a “participatory entity” are necessary ingredients. The participatory entity, understood as a platform to incorporate the vision of the various stakeholders in the management of the river basins, will provide the necessary social and institutional legitimacy to the basin-scale plans; conversely, without a powerful instrument such as a basin-scale plan that canalizes its vision into a concrete action plan, the participatory entity would soon lose its relevance.

23. *Conceptual and Methodological Framework.* While the details of the framework for a basin-scale plan will be developed under the activity, some preliminary elements are presented below.

24. The basin-scale plan will be the principal instrument for integrated water resources management in a river basin. Its objective will be to orient and coordinate public and private decisions around a common vision for water resources and their management in the basin. It is expected that this vision will seek to balance water requirements for people’s well-being, economic development, and the environment, following international best practices.

25. The basin-scale plan would include: (a) an assessment of the current and expected situation with respect to the situation of water resources and their management, identifying the critical issues and future climate change impacts; (b) the definition of objectives related to the issues identified in the assessment, as well as indicators and targets that will permit the monitoring and evaluation of the basin-scale plan; and (c) an action plan to reach the objectives and targets; along with an implementation and financing plan, specifying the institution responsible for implementing each action and its source of financing.

26. The measures included in the action plan will be both non-structural (such as increasing information and knowledge about the water system, application of the legal and regulatory framework, development of incentive programs, capacity building and public awareness) and structural (i.e., hydraulic infrastructure).

27. *Organizational Structure and Coordination Mechanisms.* A basin committee, composed of representatives of the main public and private water stakeholders, would be established in each river basin. It would have the following functions: (a) guide the formulation of the basin-scale plan and facilitate and coordinate the participation of the stakeholders in the basin; (b) facilitate and coordinate the exchange of information between public and private actors, and provide information access to the general public regarding the situation and management of water resources; (c) discuss and approve the draft basin-scale plan; (d) monitor and encourage its implementation; and (e) facilitate agreements between the various stakeholders/institutions.

28. The basin committee would be composed of representatives from the main types of public and private stakeholders in the river basin, including a representative of indigenous people, where relevant. Care needs to be taken in the identification of the stakeholders groups and in the election of the respective representatives to ensure a balanced representation of stakeholders' views and interests, which is key for a legitimate basin committee. The selection process should be based on agreed-upon criteria and transparent procedures. It is proposed that 40 percent of the representatives come from the public sector and the rest from private stakeholders and the general public, with the number of representatives not exceeding 20 people.

29. The basin committee would include (a) a Council comprising all members (presided by one of its members) to discuss and approve the Basin-scale Plan; and (b) a (technical) Executive Secretary designated by DGA/MOP, and financed under the activity. The Secretary would be in charge of preparing the plan.

30. The activity would finance a capacity building program for the members of the basin committee through international experts, which would include learning about the experience in basin-scale planning in other countries, through activities inside and outside of Chile.

(ii) Water Abstraction Control and Enforcement

31. Sub-component 1.4(ii) would support the piloting of the strengthened/new tools for the control and enforcement of water abstractions (i.e., water withdrawals without a water right or in excess of the amount specified in the water title).

32. The following activities are to be supported at basin-level:

- a) Testing of methodology developed under 1.3(ii) to locate illegal ground- and surface-water abstraction (and over-uses) in the Choapa and Maule river basins.
- b) For an aquifer declared as *area de restricción* in Choapa: (a) update water rights information registry; (b) foster coordination among and capacity building of water

- users for groundwater abstraction control; (c) install metering devices and data transmission technology in selected wells; (d) develop a module for the reception and visualization of water abstraction data by the Water Users Organization and the DGA (the cost of this activity is covered under sub-component 1.2); and
- c) Same as under (ii) in a river and its tributaries managed by a *Junta de Vigilancia* of the Choapa river basin.

(iii) Dam Safety Management for Selected Dams

33. The Project would support the risk evaluation, instrumentation and design of dam safety management plans for three selected dams. This would include: the elaboration of a digital dam safety file; the identification of potential failure modes; the estimation of risks and the prioritization of actions to mitigate risks; improvements to dam instrumentation and the reevaluation of the risk after the implementation of the first corrective actions.

34. The elected Dams are: the Colbún Dam (VII Region), the Corrales Dam (IV Region), and the Tutuvén Dam (VII Region).

35. The Colbún dam belongs to the large dams (with a height of 116 m), built in the 1980s by ENDESA. Now it is operated by a private corporation (Colbún). The DGA's and MOP's authorization processes were followed as per article 294 of the Water Code. The dam is one of only two Chilean reservoirs subject to the Law 20304 on dam operation during flood alert and emergencies.

36. The Corrales dam is also a large dam (with a height of 70 m). It was built in 2000 by DOH who still operates it. Though its main purpose is irrigation, it has not yet been transferred to its users and future operators. Since DOH is only required to inform DGA when it builds a dam, the Corrales dam did not follow the procedures stipulated in Article 294 of the Water Code.

37. The Tutuvén dam is a smaller dam (with a height of 32 m) made from loose materials. It was built by the DOH in 1951. Its main purpose is irrigation, and it is operated by users (irrigators).

Component 2: Infrastructure Services Planning

38. The component will provide support for the consolidation of the Planning Directorate's planning tools and capacities, to allow for an improved coordination with other ministries and/or public institutions involved in infrastructure, the private sector and the Borrower's regional governments, through:

Subcomponent 2.1: Support for the Development of the National Infrastructure and Water Master Plan

39. The sub-component support the development of the National Infrastructure and Water Master Plan up to the year 2035 through the incorporation of new instruments for inter-ministerial coordination, and the definition of national priorities that can serve as guideline for future regional planning under Chile's new decentralization process. This will comprise the following activities:

- i) Adjustment of the vision and strategic orientations for the provision of public infrastructure services required to reach the status of developed country by 2035.
- ii) Strategic studies for the development of the Master Plan
- iii) Participatory, public-private workshops for validating the measures to be included in the Master Plan;
- iv) Preparation of the Master Plan document, including its cartography, publication and dissemination; and
- v) Design and implementation of a monitoring and evaluation system for the Master Plan.

Subcomponent 2.2: Development of Territorial Infrastructure Inequality Indices

40. The sub-component intends to help develop territorial infrastructure inequality indices to orient infrastructure services provision for a more equitable development of the territory. These indices are expected to improve infrastructure prioritization processes, contributing to an inclusive territorial vision for a social and productive development. The following activities will be supported:

- i) Definition of the methodology for the elaboration of territorial infrastructure inequality indices;
- ii) Quantitative implementation of the indices at different territorial levels;
- iii) Analysis and interpretation of territorial inequalities in terms of infrastructure; and
- iv) Development of guidelines for the use of the indices.

Subcomponent 2.3: Strengthening of the Planning Directorate's Capacity for Infrastructure Planning and Knowledge Management

41. The sub-component aims to strengthen MOP's technical capacity for infrastructure planning and knowledge management, through the following activities:

- i) Updating of the ministerial planning model to take into consideration the new decentralization process;
- ii) Developing a framework for the assessment of ministerial plans (National Infrastructure and Water Master Plan and Regional Plans);

- iii) Developing a system for the consolidation and systematization of institutional knowledge, and thereafter make the system available to users, through:
 - a) Design and implementation of a knowledge management model for infrastructure planning within MOP;
 - b) Design and implementation of a database and a digital platform that integrates the basic information and studies developed by MOP that are needed during the different planning processes; and
 - c) Design and implementation of the first stages of a training program for MOP and Regional Governments' staff on infrastructure services planning.

Component 3: Institutional Strengthening for Infrastructure Concession

42. The component aims at strengthening the capacity of CCOP, through:

Sub-component 3.1: Strengthening the Regulatory Framework and Strategic Management for Concessions

43. The sub-component will support:

- i) The provision of support for the drafting of the necessary modifications to the normative and regulatory framework for infrastructure concessions (i.e., *Reglamento Ley de Concesiones*); and the processing of the legal initiatives required for the creation of the General Directorate for Public Infrastructure Concessions (i.e., Law, Staff Decree, Internal Organizational Resolution);
- ii) The design and implementation of a participatory strategic and transition management plan, including the implementation of an annual communication plan;
- iii) The design and implementation of a monitoring and evaluation system for the concessions program.

Subcomponent 3.2. Improvement of CCOP's Operational Model

44. The sub-component will comprise the following activities:

- i) Assess and define an improved operational model for CCOP: project identification, project preparation, contract management and monitoring (*Inspectoría Fiscal*);
- ii) Develop and implement the new operational processes defined in (i) above.

Subcomponent 3.3: Capacity Building and Information System

45. The sub-component focuses on two main areas. The first area aims to strengthen CCOP's human resources. The effort will focus on identifying knowledge and experience gaps and

involves: the redefinition of requirements and competences for each position; the development of policies and practices for talent recruitment, and the selection, hiring, incentives, evaluation, training, and retention of human resources, including the design and implementation of targeted training programs. The second area is the development of the information system to enable proper management of infrastructure concession projects, including systems to handle complaints from users and client suggestions. This will improve the accountability and transparency of internal information for project control and monitoring in CCOP. The following activities will be supported:

- i) The design and implementation of a human resources management policy and strategy:
 - a) Design of human resources policies, including: recruitment, selection, hiring, incentives, evaluation, training and retention of human resources;
 - b) Structuring of job profiles;
 - c) Analysis of human resources gaps; and
 - d) Design and implementation of training programs.

- ii) The development and implementation of an information system on concession projects and of a knowledge management model to enable proper management of infrastructure concession projects, while improving and increasing the transparency of internal information for project control and monitoring in CCOP:
 - a) Information gaps identification. The topics covered will include: historical and current project information, users' communication mechanisms, project management and monitoring information, among others;
 - b) Design of the information systems considering their integration with other existing internal and external systems of CCOP;
 - c) Development and/or provision of software for the information system, including provision of hardware as necessary;
 - d) Information systems implementation and commissioning. Digitalization and systematization of projects and contracts information;
 - e) Training of information system users; and
 - f) Development and implementation of knowledge management practices.

Annex 3: Implementation Arrangements

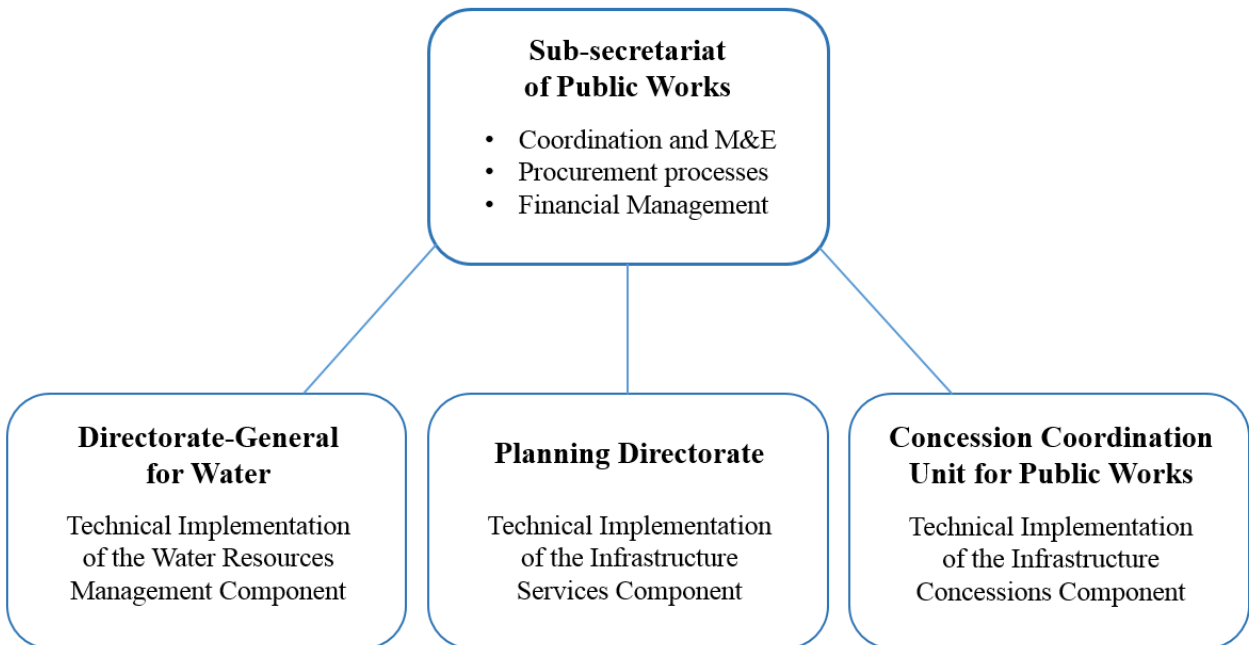
CHILE: Integrated Water Resources Management & Infrastructure Development Project

1. This Annex contains four sections. The first section describes the Project implementation arrangements; the second outlines the financial management, disbursements and procurement arrangements; and the third addresses the environmental and social safeguards triggered by the Project.

Project Implementation Arrangements

2. The MOP will be the implementing agency. Within MOP, the Sub-Secretariat of Public Works will be responsible for overall Project coordination, monitoring and evaluation as well as fiduciary aspects. The DGA, the Planning Directorate, and the CCOP will be responsible for the technical implementation of their respective components, including the preparation of related implementation and procurement plans; terms of reference, and specifications of goods and services to be contracted; the participation in the evaluation committee and the supervision/reception of those goods and services; the monitoring and evaluation of their respective components; and the application of the relevant social and environmental safeguards.

Figure A3.1: Project Implementation Arrangements



3. In order to be able to fulfill those roles, the Sub-Secretariat of Public Works, DGA (in headquarters and two of its regional offices), the Planning Directorate and CCOP will be strengthened through the contracting of consultants, staff training and the provision of necessary equipment, financed by the Project.

Financial Management and Disbursements

4. A Financial Management Assessment (FMA) was carried out to evaluate the adequacy of the proposed financial management arrangements for the implementation of the Project.

5. As stated above, Project implementation will be under the Ministry of Public Works while overall coordination, including financial management activities of the Project will be done by the Sub-Secretariat of Public Works. This means that all accounting, disbursement and financial reporting activities will be centralized in the Accounting and Finance Department of the Sub-Secretariat of Public Works.

6. Based on the information available, the financial management risk is considered moderate because: (a) although the fiduciary activities are centralized, Project implementation requires interaction with several actors, which demands close coordination to avoid delays in Project implementation; and (b) the Accounting and Finance Department has had previous experience with Bank-financed projects.

7. Organization and staffing. Financial management for the Project will require that the Sub-Secretariat, with the assistance of the Accounting and Finance Department, carry out the following activities: (a) prepare the Project's annual budget and operational plan; (b) manage a local currency bank account where funds transferred from the Designated Account (DA) would be deposited; (c) manage procurement and contracting processes; (d) process and record Project transactions in the Financial Management and Contract system (SAFI, *Sistema de Administración Financiera y de Contratos – Presupuestal aprobado por la Contraloría de la República*); (f) prepare Project financial statements; and (g) coordinate the annual financial audit reviews.

8. The Sub-Secretariat's Accounting and Finance Department is staffed with experienced and qualified personnel who are in charge of accounting, budgeting and treasury functions. For Project purposes, those teams will be strengthened with: (a) one Project coordinator, (b) two finance analysts to support the MOP, and (c) three additional finance analysts, each dedicated to one of the three components of the project (DGA, Planning Directorate, CCOP). Each position will be hired under TORs approved by the Bank and financed with loan funds.

9. Programming and Budgeting. The MOP will be responsible for: (a) budget preparation and execution; (b) preparation of Annual Operation Program (AOP); and (c) procurement plan, all of them to be reviewed by the Bank, and which will be used for monitoring purposes.

10. Accounting Policies and Information System. The regulatory financial management framework in Chile includes: (a) the State Financial Management Law (*Ley Orgánica de la Administración Financiera del Estado*, Decreto Ley N° 1263 de 1975); (b) accounting procedures manual for the Public Sector (*Manual de Procedimientos Contables*) issued by the Supreme Audit Institution (*Contraloría General de la República de Chile*, CGR); (c) the annual Law of the General Budget of the State; and (d) the Ministry of Finance regulations and manuals.

11. Within this framework, Project transactions will be accounted for in SAFI while Project reports will be issued by the Accounting and Financial Information System (SICOF, *Sistema de*

Información Contable Financiero). The financial reports from SICOE have been reviewed and they meet the minimum requirements of the Bank for financial reporting purposes.

12. Processes and procedures (including Internal Controls). The MOP must comply with requirements related to financial management, including internal controls and internal procedures to adequately control, record, and carry out payments, and generate timely information. The Project will benefit from the use of the accounting procedures manual for the Public Sector, in particular Resolution 759, which defines the main accounting and reporting procedures for the administration of resources provided by a third party (*Administración de Fondos de Terceros*).

13. Financial Reporting and Monitoring. Considering the above section on accounting and information systems, the MOP would be responsible for preparing Project financial statements (including Interim Financial Reports). Project financial reports will be prepared on the basis of cash accounting and issued by the SICOE system. Specific financial reporting arrangements include:

- a) *Project-Interim financial reports (IFRs)* will include loan and counterpart funding prepared in local currency and U.S dollars and submitted to the Bank on a semi-annual basis, but no later than 45 days after the end of each calendar semester. They will include: (i) a statement of sources (funds disbursed by the Bank) and uses of funds (expenditures paid and documented), reconciling items (advances made but not yet documented) and cash balances; (ii) statement of cumulative investments; (iii) DA reconciliation; and (iv) explanatory notes to the financial statements. The core content of the reports has been agreed and samples of the reports have been reviewed and found acceptable.
- b) *Annual financial statements* for the Project (with the content and format described above) would be prepared by the MOP.

14. Audit Arrangements. Annual audit reports on the Project financial statements, including management letter, would be submitted to the Bank within six months of the end of the Borrower’s fiscal year. The audit will be conducted by the Supreme Audit Institution of Chile (CGR) in accordance with International Standards on Auditing (ISA) issued by the International Federation of Accountants (IFAC). If, due to any unforeseeable circumstances, CGR is not able to perform the audit of the Project, an independent private auditor -acceptable to the Bank- may be hired. Under these circumstances audit TORs will require the Bank’s no objection and audit costs will be financed out of loan proceeds. The scope of the audit would be defined by the Project in agreement with the Bank. Audit requirements would include the following:

Table A3.2: Audit Report

Audit Report	Due date
Project financial statements	June 30
Management Letter	June 30

15. Funds Flow and Disbursement Arrangements. The Bank will disburse loan proceeds using the disbursement methods of reimbursement, advance and direct payment. Under the advance method, a DA, in US dollars, will be opened and maintained in the National Bank (*Banco Estado*)

by MOP. Funds deposited into the DA as advances, will follow Bank’s disbursement policies and procedures -as described in the Disbursement Letter. The MOP will also open a local currency bank account in pesos at the National Bank (*Banco Estado*), where funds withdrawn from the DA will be deposited.

16. Funds flow arrangements are detailed in the Operational Manual and include the obligation to maintain records evidencing eligible expenditures, copies of receipts and supplier invoices, etc., of the Project for ex-post review from the Bank and external auditors.

17. Partial advances may be made to the DA as long as the aggregate amount advanced does not exceed the ceiling of USD 4 million. Retroactive Financing would be available for payments made prior to the date of the Loan Agreement but on or after July 29, 2015 up to an aggregate amount not to exceed USD\$8,000,000. The Project has to assure that payments have been procured in accordance with applicable Bank procurement procedures; and that such payments do not exceed 20 percent of the loan amount.

18. Loan proceeds would be disbursed against the following expenditures categories:

Table A3.3: Disbursement Table

Category	Amount of the Loan Allocated (expressed in USD)	Percentage of Expenditures to be financed (inclusive of Taxes)
(1) Goods, non-consulting services, Operating Costs, and consultants’ services	40,791,765	Up to 100%
(2) Front-end Fee	102,235	Amount payable pursuant to Section 2.03 of this Agreement in accordance with Section 2.07 (b) of the General Conditions
(3) Interest Rate Cap or Interest Rate Collar premium	0	Amount due pursuant to Section 2.08(c) of this Agreement
TOTAL AMOUNT	40,894,000	

19. Supervision Plan. Financial Management supervision would include on-site and off-site supervisions. On site supervision missions will be carried once a year at a minimum with regular off-site supervisions such as desk reviews of interim financial reports and audited financial statements.

Procurement

General

20. Procurement for the proposed Project would be carried out in accordance with the World Bank's Guidelines: "Procurement under IBRD Loans and IDA Credits" dated January 2011, revised July 2014; "Guidelines: Selection and Employment of Consultants by World Bank Borrowers" dated January 2011, revised July 2014; and the provisions stipulated in the Loan Agreement. The various items under different expenditures categories are described in general below. For each contract to be financed by the Loan, the different procurement methods or consultant selection methods, estimated costs, prior review requirements, and time frame, are agreed between the Borrower and the Bank in the Procurement Plan. The Procurement Plan will be updated at least annually or as required to reflect the actual Project implementation needs. The Borrower, through the Sub-Secretariat of Public Works, has prepared a Preliminary Procurement Plan for the entire scope of the Project, and a detailed and comprehensive procurement plan, that includes all contracts for which bid invitations and invitations for proposals are to be issued in the first 18 months of Project implementation. The Procurement Plan will be available in the Procurement Plan Execution System (SEPA). Goods, and non-consulting services shall be procured under contracts awarded on the basis of International Competitive Bidding, National Competitive Bidding, Shopping, Direct Contracting and Framework Agreements of the Public Market (*Mercado Público*) of *ChileCompra*. Consultants' services shall be procured under contracts awarded on the basis of Quality and Cost-Based Selection, Quality-Based Selection, Selection under a Fixed Budget, Least Cost Selection, Selection Based on the Consultants' Qualifications, Single Source Selection and Procedures set forth in Section V of the Consultant Guidelines, for the Selection of Individual Consultants, including Single-Source Selection for Individual Consultants, and *ChileCompra* for consulting firm services up to USD 300,000 equivalent.

Assessment of the agency's capacity to implement procurement

21. Country. The risk associated with the Bank portfolio in Chile is low; government contracts in Chile are conducted transparently and efficiently thanks, in part, to a modern and transparent electronic procurement system (the Public Market of *ChileCompra*); although procurement processes, outside the use of this system could be lengthy at times, the robustness and capacity of institutions in charge of procurement make Chile one of the countries with the most reliable and transparent procurement systems in the region.

22. Agency. In accordance with the implementation arrangements, the procurement activities will be carried out by the Sub-Secretariat of Public Works with technical inputs from DGA, the Planning Directorate and CCOP. The Sub-Secretariat of Public Works is composed by a Procurement Department ("*Subdivisión de Abastecimiento*"), within the Administrative Coordination Department ("*Coordinación Administrativa*"). A procurement assessment was finalized in June, 2015, to examine the Sub-Secretariat of Public Works': (a) organizational structure, (b) facilities and support capacity, (c) qualifications and experience of the staff that will work on procurement, (d) record-keeping and filing systems, (e) procurement planning and monitoring/control systems used; and (f) capacity to meet the Bank's procurement contract reporting requirements.

23. Considering the country's and the agency's capacity to implement procurement, as outlined above, the overall Project risk for procurement is moderate.

24. The corrective mitigation measures proposed are:

Table A3.4: Procurement Implementation Capacity Action Plan

Mitigating Measures	Stage
Preparation of an adequate operation manual	Completed
Preparation of a draft procurement plan	Completed
Adjust sample bidding documents for National Competitive Bidding and shopping	Completed
Training in procurement, carried out by the Bank	At the launch of the Project, and during implementation, as needed
Use of Procurement Plan Execution System (SEPA) as the system to monitor Procurement Plan	During implementation of the Project
Hiring a partial or full-time skilled consultant, with knowledge of Bank's procurement Guidelines	During implementation of the Project
Procurement reviews conducted by independent auditors and/or Bank staff	During implementation of the Project

Procurement Plan

General

25. The procurement plan approved by the Bank in July 15, 2015, will be updated in agreement with the Project team, at least annually or as required to reflect the actual project implementation needs. The Procurement Plan will be available and updated through the Procurement Plan Execution System (SEPA).

Goods and non-consultant services

26. *Prior Review Threshold:* Procurement Decisions subject to Prior Review by the Bank as stated in Appendix 1 to the Bank's "Guidelines: Procurement under IBRD Loans and IDA Credits".

Table A3.5: Thresholds for procurement methods and prior review (thousands of USD)

Expenditure Category	Contract Value (Thresholds) (USD '000)	Procurement Method	Contracts Subject to Prior Review
Goods and Non-Consulting Services	>3'000,000	ICB	All
	100 – 3'000,000	NCB*	First
	<100	Shopping / ChileCompra	First
	Regardless of value	DC	All
Note:	ICB = International Competitive Bidding NCB = National Competitive Bidding DC = Direct Contracting		

* For contracts up to USD 350,000 equivalent, *Mercado Público* portal of ChileCompra may be used for advertisement and processing, as alternative to NCB and Shopping Bank's procedures, provided that the bidding documents are acceptable to the Bank.

27. The Borrower through the Sub-Secretariat of Public Works, as part of the Project's preparation, has prepared the Operation Manual which provides detailed procurement information for Project implementation.

Table A3.6: Summary of the Procurement Packages for Goods (based on Procurement Plan of July 15, 2015)

1	2	3	4	5	6	7
Ref. No.	Description	Estimated Cost (USD million)	Packages	Domestic Preference (yes/no)	Review by Bank (Prior/Post)	Comments
GOODS						
	Hardware and Communications Infrastructure	1.0	1	No	Prior	
	Software Licenses	2.4	1	No	Prior	
NON-CONSULTING SERVICES						

Consultant services

28. *Prior Review Threshold:* Procurement Decisions subject to Prior Review by the Bank as stated in Appendix 1 to the Bank's "Guidelines: Selection and Employment of Consultants by World Bank Borrowers".

Table A3.7: Thresholds for procurement methods and prior review (thousands of USD)

Expenditure Category	Contract Value (Thresholds) (USD '000)	Procurement Method	Contracts Subject to Prior Review
Consulting Services			
- Firms	>300	QCBS, QBS, FBS, LCS	All
	≤300	QCBS, QBS, FBS, LCS, CQS, <i>ChileCompra</i>	Only Terms of Reference
	Regardless of value	SSS	All
- Individuals		3 CVs	>100
		DC	All
Note:	QCBS= Quality and Cost Based Selection QBS= Quality Based Selection FBS= Fixed Budget Selection LCS= Least Cost Selection CQS= Selection Based on Consultant's Qualifications SSS= Single Source Selection		

29. *Short list comprised entirely of national consultants:* Short list of consultants for services estimated to cost less than USD 500,000 equivalent per contract, may consist entirely of national consultants in accordance with the provision of paragraph 2.7 of the Consultant Guidelines.

Table A3.8: Consultancy Assignments with Selection Methods and Time Schedule (based on Procurement Plan of July 15, 2015)

1	2	3	4	5	6
Ref. No.	Description	Procurement Method	Estimated Cost (USD million)	Processes	Review by Bank (Prior/Post)
	Firms				
	Revision of DGA business architecture	Mercado Público	0.3	1	Post
	Updating of the module for the management of water rights	QCBS	1.0	1	Prior
	Development and upgrading of software modules	QCBS	1.5	5	Prior / Post
	Basic studies for the development of the National Water Plan	QCBS	1.3	1	Prior
	Water Resources Diagnostics for the elaboration of Water Resources Management Plans	QCBS	0.6	2	Prior

	Elaboration of the Infrastructure and Water Master Plan	QCBS	0.5	1	Prior
	Master Plan Cartography development	QCBS	0.5	1	Prior
	Assessment and definition of an improved operational model for CCOP	QCBS	0.4	1	Prior
	Individuals				
	Project Implementation Team	IC		Several	Prior / Post

Supervision of the Project

30. In addition to the prior review supervision to be carried out from the Bank offices, the capacity assessment of the Sub-Secretariat of Public Works has recommended annual supervision missions to visit the field to carry out post review of procurement actions.

Environmental (Including Safeguards)

31. Based on the environmental and social screening conducted as per OP 4.01, the Project is classified Category B, and the following environmental safeguards apply to the preparation of the national and basin plans: Environmental Assessment (OP/BP/GP 4.01) and Natural Habitats (OP/BP/GP 4.04). In order to comply with those Policies, the Borrower will prepare the TORs for the national and basin infrastructure and water plans to include the principles of OP 4.01 and OP 4.04 in a manner satisfactory to the Bank.

32. Overall, the Project is expected to have positive environmental effects by improving the management of water resources, including by better safeguarding environmental water needs in terms of quantity and quality—at the national level and especially in the two basins of Choapa and Maule. This will be achieved by (i) strengthening the National Water Information System for better decision making; and (ii) strengthening MOP’s capacity for (a) water resources planning at national and basin levels, taking into account environmental considerations; and (b) the control and enforcement of water abstractions, including regarding environmental flows.

33. However, despite these anticipated positive environmental impacts, the Project will finance the preparation of national and basin water and infrastructure plans that may prioritize activities/projects (structural and non-structural) that, once implemented, may have positive, neutral or negative impacts on the environment. Considering that those activities/projects will not be financed by the Project, it was not considered necessary to prepare an Environmental Management Framework (EMF) to ensure that works are subjected to an adequate environmental assessment process. Rather, in accordance with the guidelines on the application to safeguards to technical assistance activities in Bank-financed projects dated January, 2014, and to ensure conformity with the Bank and Government environmental policies beyond the life of the Project, the TORs for the formulation of the plans and associated methodology will incorporate the principles of OP 4.01 and OP 4.04 in a manner satisfactory to the Bank. In particular, they will

include specific reference to understanding and identifying environmental risks, and will follow rigorous consultation processes with relevant stakeholders. The task team's environment specialist will provide training to project implementers, review the ToR and their adequate implementation.

34. OP 4.37 is not triggered because the Project does not finance the construction of new dams, nor the rehabilitation or alteration of existing dams. Moreover, it does not rely on the performance of existing dams or dams under construction to achieve its objectives and targets. Nevertheless to ensure that no negative impacts result from the technical assistance tasks, the activities related to: (i) the development of tools for the improvement of dam safety under Subcomponent 1.3 of the Project, and (ii) the preparation of the risk evaluation, instrumentation and design of dam safety management plans for the Selected Dams under Subcomponent 1.4 of the Project shall be performed in accordance with the TORs agreed upon with the Bank and in compliance with the Bank's applicable safeguard policies, including on dam safety.

Social (Including Safeguards)

35. The social outcomes of the Project are expected to be positive. Among the notable benefits will be the increased participation of stakeholders in water resources management, resulting in a more equitable and transparent decision-making process, and the development of territorial infrastructure inequality indices that can be applied for closing the infrastructure gap in underserved areas of the country.

36. The World Bank's Operational Policy OP 4.10 on Indigenous Peoples is triggered as a precautionary measure and in relation with the river basin water resources planning activities. The Borrower, through the National Commission for Indigenous Development (CONADI), did not identify any indigenous communities in the basins of Choapa and Maule. Instead, it identified ten indigenous associations, two in the Choapa and eight in the Maule river basins. According to Law 19253 of 1993 that aims to promote and protect the indigenous peoples of Chile, indigenous associations are defined as groups of individuals not smaller than 25 members that are created to reach a common goal related to cultural, educational or economic activities. The Law explicitly states that indigenous associations do not replace, nor represent the indigenous communities of Chile. The Policy is triggered because the information on the indigenous associations in the Choapa and Maule basins gathered so far is partial. It indicates that the associations are diverse—with some of them women's associations, and others devoted to spiritual purposes, environmental objectives, or cultural revitalization goals – but is insufficient to ascertain that none of those associations have the characteristics of an indigenous community as defined by the Bank OP 4.10.

37. In order to comply with Bank Policies, and in accordance with the guidelines on the application of safeguards to technical assistance activities in Bank-financed projects dated January 2014, the Borrower will include the principles of OP 4.10 related to social assessment, stakeholder engagement and meaningful consultation, in a manner satisfactory to the Bank, into the TORs of the basin-scale, water resources management plans to be carried out under the Project in the Choapa and Maule basins. The task team's social specialist will provide training to project implementers, review the TORs and monitor their adequate implementation.

Annex 4: Implementation Support Plan

CHILE: Integrated Water Resources Management & Infrastructure Development Project

1. The Implementation Support Plan describes how the World Bank will provide the advice necessary to facilitate achieving the Project Development Objectives. The Plan also identifies the minimum requirements to meet the World Bank's fiduciary obligations.

Strategy and Approach for Implementation Support

2. Implementation Support from the Bank will consist of the regular semi-annual full supervision missions from the Bank team, meetings and audio conferences between the Bank team and the relevant implementation agencies, and close coordination through the Bank staff located in Chile. Through the supervision missions, the team will also visit the two identified pilot basins and the three pilot dams on a rotational basis. Additional support will be provided by the Bank's procurement, financial management and safeguards specialists. In addition, the Bank will complement its support by mobilizing international experts to advise the Government of Chile on the implementation of the Project's technical components, in particular the ones related to hydro-meteorological information and dam safety. This strategy is an indicative and flexible instrument that may be revised during Project implementation based on emerging Project challenges and field conditions.

3. The full semi-annual supervision missions and the short follow-up technical missions, as needed, will focus on the following areas:

Strategic support: Supervision missions will meet with national and local authorities to: (a) review progress on the Project's activities; (b) discuss strategic alignment of the Project's different activities, especially at the planning level between the relevant stakeholders; and (c) evaluate progress on cross-cutting issues like monitoring and evaluation, training, communication, dissemination of Project results and experiences, and coordination between relevant stakeholders.

Technical support: Supervision will concentrate on: (a) the elaboration of appropriate methodologies for the development of the various national, regional and river-basin activities under components 1 and 2; (b) the coordination of activities under component 1 at the national and basin level; (c) support in the development of relevant tools and capacity-building under components 2 and 3; and (d) ensuring the different implementing agencies' ability to provide quality management of Project interventions, both nationally through DGA, the Planning Directorate and CCOP, and at the basin level through DGA's regional offices. Field visits will serve to verify compliance with the Project's Operational Manual and inform adjustments to Project design, as needed, according to conditions on the ground. Thematic specialists will complement the permanent Bank supervision team as needed, through short-term cross support of Bank staff.

Fiduciary support: Periodic supervision of procurement and financial management aspects will be provided by the Bank team specialists. In particular, these specialists will:

(a) provide training and guidance on the conduction of procurement processes in compliance with the Procurement and Anti-Corruption Guidelines and the Project Operational Manual to each of the implementing agencies (*Subsecretaria de Obras Públicas*, DGA, the Planning Directorate and CCOP); (b) work with each of these agencies to enhance their capacity in procurement and financial management to facilitate Project implementation; (c) review procurement documents and provide timely feedback to the implementing agencies; and (d) help monitor Project progress against the procurement plan. Supervision of both the procurement and financial management aspects of the Project will be carried out semi-annually during the regularly-scheduled Bank supervision missions, with continued contact between these visits as needed.

Safeguards support: The coordination begun during preparation will continue throughout Project implementation, especially to ensure that relevant safeguards concerns are included in the national and river-basin plan TORs, and that the associated clauses are applied satisfactorily. Supervision from the Bank safeguard specialists will take place at least once a year and close communication will be maintained if requested by the Government.

Table A.4.1: Implementation Support Plan

<i>Time</i>	<i>Focus</i>	<i>Skills Needed</i>	<i>Resource Estimate (Staff weeks)</i>	<i>Partner Role</i>
<i>First twelve months</i>	Procurement training and review of bidding documents	Procurement Specialist	4	
	FM training and supervision, including retroactive financing	FM Specialist	3	
	Social safeguards – review of terms of reference	Social Specialist	1	
	Environmental safeguards – review of terms of reference	Environmental Specialist	1	
	Technical review of Terms of Reference and bidding documents	Task Team Lead, Technical Specialists	10	
	Development of Information System Architecture	Task Team Lead, WRM Specialists	3	

	Development of Dam Safety Framework	Dam Safety Expert	3	
	Methodology for National and basin-level planning, WRM	Task Team Lead, WRM Specialists	3	
	Methodology for National planning, infrastructure	Task Team Lead, Infrastructure Specialists	3	
	Development of regulatory instruments, Concessions	Transport and concession Specialist	4	
<i>12-48 months</i>	Procurement review of bidding documents	Procurement Specialist	4	
	Technical review of Terms of Reference, technical reports and bidding documents	Task Team Lead, Technical Specialists	10	
	FM supervision	FM Specialist	3	
	Social safeguards – supervision	Social Specialist	3	
	Environmental safeguards – supervision	Environmental Specialist	3	
	Project management and Project supervision coordination	Task Team Lead, Technical Specialists	10	

Table A.4.2: Skills Mix Required

<i>Skills Needed</i>	<i>Number of Staff Weeks</i>	<i>Number of Trips</i>	<i>Comments</i>
Task Team Leader, Senior WRM Specialist	15	3	HQ-based
Co-TTL, Senior WRM Specialist, Chile-based	15	4	Chile-based
Senior Transport and ICT Specialist	10	2	HQ-based
WRM Specialist with focus on Information Systems	10	2	HQ-based
Junior WRM Specialist	8	2	HQ-based
Public Sector Reform Specialist	4	2	HQ- or Country office -based
Financial Management Specialist	2	2	HQ-based
Procurement Specialist	8	3	Lima Office
Environmental Specialist	1	1	Lima Office
Social Specialist	1	1	HQ-based
Water Economist	4	2	HQ-based
Dam Safety Expert (STC)	2	1	Spain-based

Table A.4.3: Partners

Name	Institution/Country	Role
Project Implementation	DGA, the Planning Directorate, CCOP	Implementation of Project activities under assigned components
Project Oversight	Subsecretaria de Obras Públicas	Provide overall Project oversight and sector guidance
Other Government of Chile Institutions	DIPRES	Overall guidance, Project financing
Other participation institutions	Regional Governments, other basin stakeholders	Support to implementation and supervision of basin-level activities

Annex 5: Detailed Sectorial and Institutional Context

CHILE: Integrated Water Resources Management & Infrastructure Development Project

1. This annex provides a description of the sectorial and institutional context in water resources management and public infrastructure planning and concessions.
2. Chile occupies a narrow stretch of land measuring 4,200 km in length and with an average width of 180 km, located between the Andean Cordillera and the Pacific Ocean. This geography provides for a wide variety of climate conditions, ranging from arid conditions in the northern half of the country to areas with abundant rainfall in the south. The country is administratively divided into 15 regions, whose limits are more or less in line with hydrographic boundaries. Chile is home to a population of 17 million. Close to 90 percent of the people are concentrated in cities, with the Metropolitan Region of Santiago (*Región Metropolitana*, RM) accounting for almost a third of Chile's population. The population growth rate is at about 1 percent per year (World Bank, 2010). GDP has increased threefold over the last 25 years. Poverty has decreased from 29 percent in 2006 to 14 percent in 2013. Chile has entered the OECD in 2010 and expects to reach per capita income, territorial equity and social inclusion similar to Italia, Slovenia and New Zealand by 2030. This will require boosting economic growth and increasing opportunities for all through public sector reform and increased investment, particularly in infrastructure, while strengthening social policies that target the poor and better managing scarce water resources.

A. WATER RESOURCES

a. State of Water Resources in Chile

3. Chile's unique geography gives rise to a number of challenges related to water resources management. The more than 100 short and steep river basins,²⁵ with mostly torrential flows and highly connected surface and groundwater make basin-scale, integrated water resources management a very demanding task.
4. Rapid economic growth and social development are putting increasing stress on water resources, especially in semi-arid and arid central and northern Chile. From the Metropolitan region to the north, water is over-allocated, showing signs of over-exploitation in some basins and aquifers. During the last three decades, the situation with regards to water resources in Chile has changed profoundly. The strengthened role of the market and the move towards an export-oriented economy in the 80s based on products such as copper, fresh fruits, wood pulp, lumber, salmon and wine – all of which use significant amounts of water in their production processes –as well as the heavy reliance on hydropower for energy generation have led to a doubling in water use.

²⁵ Subsecretaria de Desarrollo Regional y Administrativo. "Guía Análisis y Zonificación de Cuencas Hidrográficas para el Ordenamiento Territorial." 2013.
http://www.subdere.gov.cl/sites/default/files/documentos/guia_zonificacion_final_con_isbn.pdf

Table A.5.1: Actual and Projected Regional Water Balance (m³/s)

Region	Actual Demand	Actual Availability	Actual Balance	Demand 15-yr	Availability 15-yr	Balance 15-yr
XV-I	16.7	11.9	-7.4	26.3	11.9	-17.0
II	23.0	0.9	-22	34.8	0.9	-33.8
III	16.7	1.9	-14.8	22.4	1.9	-20.5
IV	35.0	22.2	-12.8	41.8	21.1	-20.7
V	55.5	40.7	-27.4	64.2	36.6	-38.7
RM	116.3	103.0	-35.6	124.9	92.7	-51.4
VI	113.5	205.0	38.7	119.1	184.5	18.7
VII	177.1	767.0	442.5	184.5	690.3	383.6
VIII	148.0	1,638.0	1,249.1	246.0	1,474.2	1,033.3
IX	25.5	1,041.0	767.3	38.3	936.9	675.4
XIV-X	12.0	5,155.0	3,905.8	17.9	4,639.5	3,508.1
XI	24.9	10,134.0	8,284.9	27	10,134.0	8,282.9
XII	8.4	10,124.0	8,394.6	15.7	10,124.0	8,387.2
Country Total	772.6	29,244.6	22,962.7	962.8	28,348.5	22,107.1

Source: DGA, 2011. Modernización del mercado de aguas en Chile.

5. Most of the “consumptive” water demand is taking place in semi-arid to arid central and northern parts of the country where irrigated areas, large urban centers, industries, and mining are located. Total withdrawals amount to 4,710 m³/s, of which 89 percent for hydropower, which is considered a “non-consumptive use” as most water it captures returns to the basin and is available to be used again downstream. Most hydropower production is located in the central part of the country. Excluding “non-consumptive uses”, irrigation accounts for the largest share of withdrawals with 73 percent (1.1 million ha representing 40 percent of the cultivated area), drinking water for 6 percent, and mining and industrial uses account for 9 percent and 12 percent, respectively. Those uses are located mostly in the central and northern parts of the country.

Table A.5.2: Water Use Among the Different Productive Sectors in 2011.

Region	Flowrate per Use (m ³ /s)							
	Agriculture and Livestock	Potable Water	Industry	Mining	Energy	Forests	Aquatic	Tourism
I, XV	8.926	1.258	1.680	3.665	0.211	0.000	0.000	0.013
II	3.308	1.010	1.294	15.259	1.493	0.000	0.000	0.004
III	12.033	0.711	0.518	1.604	0.255	0.001	0.000	0.001
IV	27.194	1.526	0.251	1.770	1.250	0.031	0.000	0.006
V Norte	6.834	0.313	0.354	0.759	0.169	0.021	0.000	0.005
V Sur	35.604	4.282	4.452	0.920	87.830	0.043	0.000	0.008
VI	97.964	2.012	1.232	9.396	653.753	1.320	0.000	0.001
VII	166.489	2.211	3.771	0.000	1,342.410	0.703	0.000	0.000
VIII	69.436	4.420	9.541	1.209	1,409.240	1.338	2.800	0.001
IX	11.512	1.325	0.257	0.000	0.000	0.265	1.300	0.001
X, XIV	3.308	1.976	4.089	1.500	353.550	0.083	71.000	0.004
XI	0.644	0.194	0.082	2.500	18.008	0.000	321.000	0.001
XII	1.119	0.386	5.905	0.234	0.033	0.000	82.000	0.005
Metropolitan	82.361	18.510	10.421	0.481	129.040	0.096	0.000	0.002
Totals	526.732	40.134	43.847	39.297	3,997.242	3.901	478.100	0.052

Source: Instituto de Ingenieros de Chile. Comisión de agua, 2011.

6. Water availability is being constrained by worsening water quality from industrial, mining and agricultural pollution, high intra- and inter-annual variability in run-off and the effects of climate change in some river basins. In just over 10 years, there has been a significant reduction in the pollutant load from urban and industrial wastewater, despite a strong economic growth and urbanization rate, and a drastic reduction in the prevalence of waterborne diseases. However, water quality has decreased in some regions of the country. Significant challenges regarding water quality management are: (a) to reduce the contamination from agriculture, agro-forestry, small-scale mining operations and accumulated waste from old mines, as well as the dumping of solid and liquid waste in irrigation canals and (b) to protect coastal lakes, estuaries and groundwater, which are particularly vulnerable to pollution.

7. The high intra and inter-annual variability of runoff aggravates water shortages in the northern and central parts of the country and often leads to significant economic losses due to floods and droughts. To regulate water flows, an estimated storage capacity of about 13 billion m³ has been built, mostly for hydro-power, irrigation and water supply. In a context of increasing water shortages and high and increasing variability in water flows, Chile still has significant potential for the development of artificial reservoirs (total dam capacity accounts for less than 1.39 percent of the country's annual runoff) and for the use of aquifers as natural storage, starting by managing surface and groundwater in a conjunctive manner (surface and groundwater are very much connected in Chile).

8. Climate change exacerbates the country's water resources challenges by increasing overall evapotranspiration, modifying rainfall patterns and diminishing the capacity of natural reservoirs,

such as glaciers and snowcaps, as well as high-altitude wetlands. Some of the expected effects are: (a) a deficit in water supply to the Metropolitan Region; (b) further decreases in average annual precipitation in the central part of the country, where most of the agricultural activity is concentrated; (c) further increases in average temperature, resulting in glaciers melting and more variable water flows throughout the country; (d) intensification of drought and flood events throughout the country. Climate change is also raising the uncertainty of hydro-meteorological parameters, making water resources management more complex.

9. As a result of these developments, the interdependencies among water uses, the competition for water and associated conflicts have grown, affecting disproportionately the weakest segment of the population and the poorest parts of the economy, as well as the environment. Many of these trends are expected to continue in the short to medium term as Chile tries to achieve national development goals aimed at reaching the status of developed country by 2030.

b. Water Resources Management

10. In Chile the management of water quantity and quality aspects are mostly separated, with distinct legal and institutional frameworks. This section will discuss the legal and institutional framework related to water quantity as it is the subject of the proposed Project.

11. The Water Code (Law 1122) enacted in 1981, and amended in various occasions, is the main legal basis for the management of water resources (except for water quality). It provides the legal regime of water and water rights, defines the organizational framework and the instruments and incentives available for the management of water resources.

12. While the water code succeeded in encouraging water-related investments and improved water use efficiency, it gave rise to a number of water management problems related to the need to reconcile economic incentives with the protection of public interest, and to balance the role of the State and the private sector in the management of a resource that is crucial for balanced and sustainable development. The Water Code was reformed in 2005, strengthening the role of the State in the management of water resources and the tools at its disposal. However, the scope and depth of said reform is insufficient to address today's challenges in water resources. Various complementary proposals for reform are currently in different stages of preparation and processing, but it is still unclear when and in what form those might be passed.

(i) Water Rights in the Chilean Legislation

13. As most countries, the Chilean Water Code defines water as a national good for public use (*bien nacional de uso público*), recognizing the need to administer it for the benefit of the general interest. What makes the Chilean model unique is that the rights to use water are not concession on the public domain, but property rights. Water rights belong to the private domain, while water itself, as a national good, belongs to the public domain. This apparent contradiction is meant to recognize the multi-functionality of water: it is a social good, as everyone should have access to water for basic needs, and this access should be protected by the State, hence the nature of water as a public good; it is also an economic good, therefore water use rights are property rights to be freely used by the private sector for economic development. The need to strike the right balance

between the roles of the State and the private sector in the administration of water resources is at the core of water resources management issues in Chile.

(ii) Institutional framework

Description of the Institutional framework

14. The Water Code assigned a very limited role to the State in the management of water resources. In contrast, the role of the private sector, through Water Users Organizations (*Juntas de Vigilancia* and *Comunidades de Aguas Subterráneas*), and of the judiciary system is much stronger than in most countries.

15. The Directorate-General for Water (*Dirección General de Aguas*, DGA), housed within the Ministry of Public Works (MOP), is the main public agency responsible for water resources management. The functions of the DGA, as established in the Water Code (Art.299) are: (a) water planning; (b) water information; (c) water resources planning; (c) constitution and regularization of water rights; (d) establishment of limitations for water withdrawal; (e) control and enforcement of the provisions of the Water Code; (f) exercise of decision-support functions to courts; (g) supervision of the operation of the Water Users Organizations; (h) authorization of the use of river beds and artificial canals; and (g) authorization of large-scale hydraulic works.

16. *Water Users Organizations (WUO)*. WUO are non-profit, private entities, with legal personality, regulated by the Water Code through more than 100 articles. They are exclusively composed of water rights holders. Their creation is not mandatory, except in aquifers declared prohibited or restricted areas. Two of them have a significant role in the management of water resources: the *Juntas de Vigilancia* (JVs) in natural water ways, such as rivers, or sections of rivers, and the *Comunidades de Aguas Subterráneas* (CAS) in aquifers.

17. Their role is to administer and distribute the water to which their members have water rights. Their detailed functions, as stated in the Water Code, are the following: (a) water withdrawals administration, including special measures under drought (allocation function);²⁶ (b) supervision and control²⁷ (policing function); (c) penalties for those who do not comply with water administration measures²⁸ (power to impose sanctions); (d) mandatory execution of their decisions (self-executing power); (e) information to users on hydraulic data and forecasts;²⁹ (f) cooperation with DGA on the operation of water monitoring networks and (g) users' representation for the regularization of water rights.³⁰

²⁶ Distribuir las aguas de las fuentes naturales que administren (JV y CAS); Declarar su escasez y, en este caso, fijar las medidas de distribución extraordinarias y suspenderlas (JV); Solicitar a la DGA la declaración de agotamiento de los caudales de agua sometidos a su jurisdicción (JV);

²⁷ (a) Velar que se respeten los DAA en el prorrateo del caudal matriz, impidiendo que se extraigan agua sin título (CAS) y tomar las medidas que tiendan a la correcta distribución de los DAA sometidos a su control (JV) and (b) Velar por el cumplimiento de las obligaciones que la ley, los reglamentos y los estatutos imponen a la organización y a sus miembros (CAS y JV).

²⁸ Fijar las multas que corresponden aplicar a sus miembros (CAS y JV); Privar del uso de las aguas en los casos que prevén las leyes o los estatutos de la Junta (JV) y aplicar las multas fijadas por su directorio (JV y CAS); Solicitar, por intermedio del Juez, el auxilio de la fuerza pública para hacer cumplir y respetar las medidas de distribución de las aguas que acordase (CAS).

²⁹ Llevar una estadística de los caudales que se conducen por los canales de las Comunidades de Aguas y Asociaciones de Canalistas (JV y CAS)

³⁰ Representar a sus miembros en el procedimiento de perfeccionamiento de los títulos donde consten sus DAA de aguas (JV o CAS cuando no hay JV en el lugar)

18. The importance of the role played by JVs and CAS is strengthened by DGA's limited directive power towards them. DGA may temporarily suspend responsibilities or intervene in JVs only in case of exceptional drought or repeated offenses or abuses in water distribution.

19. The judicial system has a relatively strong role. The *Office of the Comptroller-General of the Republic* is responsible for the preventive control of the legality of various acts in the judicial system. This implies that many decisions made by DGA need to be verified by the Comptroller before being effective. This includes, for example, the constitution of water rights or declarations related to drought or prohibition or restricted areas for the issuance of new water rights. Furthermore, certain decisions related to the management of water resources are taken directly by the Comptroller, without the participation of DGA, such as the perfecting (*perfeccionamiento*) of existing water rights, with consequences on the over-allocation of water. *The Courts of Justice*, i.e., ordinary civil courts, also have an important role to play, as numerous conflicts end-up in their hands. Those are conflicts between users when those are not resolved through voluntary negotiations involving the respective users' association, or conflicts between DGA and users.

Main Issues of the Institutional Framework

20. The role, power and means of the Water Authority (DGA) need to be strengthened:

- a. DGA's role and functions are too limited considering the challenges faced today in water resources. This is an issue that will be further analyzed in the next section when revising the instruments and incentives provided by the Water Code to manage water resources;
- b. DGA lacks sufficient autonomy and authority. Water resources management implies making decisions that have strong economic, social and environmental implications, and therefore incentives are strong to influence them. In this context, DGA seems to lack sufficient autonomy with regard to the possible arbitrary removal or political-partisan appointment of its head and with regards to its sources of financing. DGA entirely depends on annual budget negotiations. It does not benefit from charges for water use, fees for non-use, or fines which would substantially increase its financial capacity. It also seems to lack autonomy vis-a-vis the judicial system to impose sanctions without passing by the court or to make decisions without prior validation by the comptroller general;
- c. DGA lacks a sufficient level of hierarchy and authority, considering that it has to deal and negotiate with ministries, regulatory agencies, local governments, and big private companies;
- d. DGA's human and financial resources as well as local-level presence are insufficient to adequately carry out its current functions, let alone the strengthened role that would be necessary to adequately manage water resources. Local-level presence is inadequate, particularly in terms of the number and qualifications of high-level staff in regional and provincial bureaus as well as in several river basins with serious problems. There is a large information and communication gap between DGA's central office in Santiago and users' organizations in charge of administering water resources in their local jurisdictions. DGA's local presence is insufficient to supervise users' organizations, provide them with the necessary technical support and training for proper water resources administration,

administer water resources where users' organizations have not been formed, deal with requests for the constitution and regularization of water rights, and encourage the formation of groundwater communities, among other key aspects that would enable it to fully exercise the leadership needed to tackle the water crisis that Chile is already experiencing in some places and that could increase significantly if preventive measures are not taken in a timely manner; and

- e. The latter problem is exacerbated by the high level of conflict between water users and DGA and in the Administration itself, which distracts DGA's activities and resources and hinders the proper exercise of functions that essentially correspond to this organization.

21. *As mentioned in the 2015 National Water Resources Policy, there are several options for institutional reform that are being considered by the Government in order to resolve the above mentioned issues. One of them is the creation of a sub-secretariat for water resources within MOP, with a strengthened DGA within it. The proposed Project will support the institutional reform by financing the detailed design of the new organization structure at national, regional and basin levels. Addressing more particularly the financing issues, it will estimate the budget of the new institution and identified sources of financing, including the feasibility of a royalty tax. Finally, it will strengthen DGA, in particular through the formulation and partial implementation of a capacity building program for its staff.*

22. As mentioned, JVs and CAS play an important role in the management of water resources, mostly with regard to the administration of water withdrawals, including in times of shortages, water abstractions control and enforcement and related conflict management. However, they present some limitations:

- a. Coverage, jurisdiction and participation: (i) despite the existence of numerous over-exploited aquifers (or close to be), only one CAS was created in the country and many rivers or sections of rivers do not have a JV. In the absence of JVs or CAS, DGA should take on their role, but Chile's geography and DGA's limited capacity on the ground does not permit this to happen; (ii) the administration of water withdrawals, in an integrated manner, at basin level, would require a JV with a jurisdiction that includes the entire basin and all water users in this basin. In practice, JV's jurisdiction is a section of river, and hydropower and groundwater users do not participate.
- b. State regulation. WUO are practically not regulated by the State, despite the important role they play in the distribution of water resources, a public good in nature, and the potential damage they may cause to water rights holders. DGA's control over WUO is limited to responding to a member complaint over water distribution or financial management. But complaints are rare and, when they occur, the procedures are such that very few of those proven guilty by DGA are subject to corrective measures by the Court. Furthermore, the sanction indicated in the Water Code is not dissuasive enough, being of a maximum of USD 1,400 (20 UTM).
- c. Transparency and accountability. The dispositions in the Water Code with regard to these topics are particularly weak. For example, there is no requirement for a WUO to make

available to its members information related to accounting, budget, amount of water distributed or to auditing those organizations.

23. Another issue is that the Water Code does not foresee River Basin Councils or Committees that would represent public and private basin stakeholders in the planning and management of water resources and play a central role in the implementation of basin-scale, participatory, integrated water management and in strengthening inter-institutional coordination at the basin level. As seen above, the JV's main role is the distribution of water from a river to the holders of water rights. It is a private entity, conceived to administer water for the exclusive benefits of its members, the water rights holders, and not to carry out functions of a public nature. Moreover, its jurisdiction is usually not the entire basin, being restricted to a section of river, and does not include groundwater and hydropower users; or interests from stakeholders that do not have water rights, such as the environment or public institutions. Finally, the Chilean experience with the “*mesas de agua*”, informal public-private participation entities established in some basins to apply the 2007 National Strategy for Integrated River Basin Management, demonstrates the necessity to legally establish those entities in order to give legitimacy to their decisions, to ensure their sustainability over time and to meet their objectives. While the 2015 Water Resources Management policy calls for the creation of such institutions, a law has yet to be drafted to introduce such reform to the Water Code. *The proposed Project will support the design and implementation of such entities in two pilot river basins: Choapa and Maule. This experience is expected to inform future reforms of the Water Code to include such organizational figures.*

(iii) Instruments and incentives.

24. The Water Code provides the instruments and incentives available to the Water Authority (DGA) for the management of water resources. These present a number of limitations. The paragraphs below analyze the instruments and functions that will be strengthened through the proposed Project.

Water Planning

25. Water planning is an increasingly critical water resources management function in Chile for the following reasons:

- (a) The limitations of the current institutional framework. More than 40 institutions are involved directly or indirectly in water management. In this context, the needs for coordination are numerous. Water plans that provide a coherent, integrated, long-term vision are therefore necessary for the adequate functioning of the institutional framework for water.
- (b) The importance of water for Chile's development. The economic growth of the past decades, without precedent in the country's history, has been based on the exports of water-intensive products (i.e. copper, fruits, wine, salmon, and cellulose). Exports from those products have increased 20 times over the past 30 years and represent 70 percent of total national exports. Water use has been an important element of Chile's exportation success. Increasing pressures on water resources render necessary a better coordination between water users to balance the water requirements of the economy, people and the environment.

26. However, there is no precedent, in Chile, of integrated water resources planning at basin or national level that have effectively coordinated the interventions of public and private institutions around a common vision for water resources.

27. The current water resources management model introduced in 1981 with the enactment of the Water Code confers a limited role to the State in water resources management. This is particularly true for water resources planning, which had not been considered very relevant in a system where water-related investments and water allocation decisions are made, primarily, by individuals based on market incentives. The Water Code includes one single reference to water planning. Art. 299 letter a) that indicates that DGA has the function to “*plan the development of water resources, with the objective to make recommendations for its use.*” This is an extremely weak definition of the water planning function.

28. Nevertheless, at the end of the 1990s, DGA, increasingly aware of the need for Integrated Water Resources Management (IWRM), started formulating Water Resources Master Plans in some river basins, such as San Jose, Imperial, Aconcagua, and Maipo. Those plans aimed at “orienting and coordinating public and private decisions with the objectives to maximize the economic, social and environmental functions of water.” Their preparation involved consultation processes and some elements of participation; but no formal organizational structure was established to make effective the participatory process and the implementation of the plans. In addition, according to the Water Code, the actions identified in those plans are only “*indicative,*” never mandatory. As a result, even if those plans had been useful for DGA decision-making and led to some important management decisions; they have never established themselves as effective instruments to orient and coordinate private and public actions for the management of water resources in the basins. Similarly, the plans prepared in the framework of the National Strategy for Integrated Watershed Management in 2007 by the National Commission for the Environment, in the river basins of Copiapo, Baker and Rapel were not followed by programs or projects to implement them.

29. No National Water Resources Plan was ever prepared in Chile. A National Water Resources Policy was published in 1999 and, more recently, in 2014, a National Water Resources Strategy was released. None of those documents have been accompanied by a concrete action plan setting objectives and targets. They have tended to not be endorsed by subsequent administrations. In May 2015, a new Water Resources Management Policy was released by the Presidential delegate for water resources in the Ministry of Interior and Public Security proposing significant institutional and legal reforms as well as large infrastructure investments in water. Still a National Plan is needed to orient and coordinate national policies, plans and programs that are directly or indirectly related to water around a common long- and medium-term vision for water resources. Such a national plan should be prepared by a multi-ministerial commission to ensure commitment at the highest level.

30. Based on the above, the following is relevant for the proposed Project:

- (a) Since there is no experience in Chile in effective integrated and participatory water resources planning at basin or national levels, the proposed Project will *develop a conceptual and methodological framework for carrying out such planning, and establish a team within DGA at national and regional levels to carry out the work effectively.*

- (b) Most past planning efforts did not materialize in concrete actions on the ground, or in effective inter-institutional coordination of public and private actions, because they were generally undertaken to respond to the needs of the institution leading the exercise and without the commitment of other key players. An effective planning exercise will require the commitment of key players; including, in particular, the regional government at the basin level as well as the Ministry of Finance and the Ministry of Social Development (MIDESO) at national level. *The proposed Project will establish an organizational structure aimed at guaranteeing the coordination and commitments of key players, in the formulation and implementation phases of the national and river basin plans.*

Water Abstraction Control

31. In Chile, the control and enforcement of water use includes two important areas, (a) illegal abstractions (without water right) and over-abstractions (in excess of water right) to avoid the overexploitation of the water resource and/or negative impacts on third parties, including the environment; and (b) payments for no-use to minimize the speculation over water rights.

32. *Control of Illegal and Excessive Abstractions.* The Water Code assigns the function of controlling water abstractions from natural sources to water user organizations (Jv and CAS) and to DGA. DGA does not have the financial and human resources to carry out this function satisfactorily. In particular, this prevents DGA from directly controlling the vast majority of the country's surface waters and all aquifers. In aquifers declared *areas de prohibición* or *restricción* the Water Code requires the creation of a CAS. So far only one such water user organization was created in Copiapo. As a result, groundwater abstraction remains largely uncontrolled—a serious issue in the overexploited (or close to be overexploited) aquifers, especially in the northern part of Chile.

33. Other major limitations for the direct control of abstractions by DGA are: (a) the potential prohibition by land owners to access the area where an illegal abstraction may take place; (b) the restriction of the DGA prerogative to demand water metering and the transmission of corresponding information to its offices, for groundwater; (c) the DGA staff in charge of controlling water abstraction (*fiscalizadores*) are not “*Ministro de Fe*,” and not supported by DGA lawyers throughout the legal process (“summary proceedings”), which means that cases, when transferred to the judge of the ordinary court for decision, are often archived; (d) the Water Code does not include a specific sanction for illegal water use, which means that the maximum fine that a judge can apply is 20 UTM (about USD 1,400)—not a sufficient deterrence to avoid illegal abstractions. Since 2012, a proposal is with Congress for amending the Water Code to address some of these issues, but it is not clear when, and in what form, this amendment will be passed.

34. Besides these limitations, the control of illegal and excessive abstractions by DGA is also limited by insufficient and inaccurate information related to existing water rights and actual water use. The inaccurate information about existing water rights is related to the fact that DGA is not always informed about new water rights created by other institutions, or about the transfer of water rights between users; when DGA is informed, its database is not always updated for various reasons. The lack of information related to water use is a result of the limited measurement of

water abstractions, the limited transmission of this information to DGA, and the lack of water user organizations in all but one aquifer.

35. The Water Code assigns DGA the task of controlling the functioning of water user organizations (*supervigilar el funcionamiento de las organizaciones de usuarios de acuerdo a lo dispuesto en el Código de Aguas*). However, no technical, legal or administrative procedures have been defined related to this function and, in practice, DGA is only controlling the functioning of water user organizations as a response to a complaint related to its water distribution or financial management. So far DGA has not controlled water user organizations in their function of controlling illegal water abstractions.

36. *Enforcement of Payments for No-Use.* This is the principal activity of DGA's Control and Enforcement Unit created in 2007 and, overall, a function that is well taken care of. The Water Code states that a water right holder will be subject to the payment of a penalty for not using water in case s/he does not have the water intake that permits withdrawing the full amount of water indicated in the water right. DGA is in charge of controlling the existence of these water intakes and their abstraction capacity in relation to the respective water right, usually outsourcing the required field visits to consultants. Payment by users is made to the National Treasury. In case of no payment, a judicial procedure sets in leading eventually to the auction of the water right. Only water rights in excess of a certain flow are subject to the penalty for no-use. Those water rights represent about 15percent of the 98,000 water rights registered in DGA's water information system.

37. The main limitations associated to this function are the following: (a) 11,000 water rights of the estimated 15,000 water rights that should be subject to control have been checked in the field; (b) of the 5,000 water rights subject to the payment of penalty for no-use every year, between 200 and 300 water rights require additional field visits because the owner opposes DGA findings; creating difficulties for DGA due to the insufficient staff and logistical means; (c) lack of communication/coordination between the various institutions involved in the process, including DGA, Notaries, *Conservadores de Bienes Raices* and the National Treasury, as well as within DGA, creating inefficiencies; and (d) the incomplete and inaccurate information of DGA about current water rights holders. Users have an incentive not to register their water rights with DGA to avoid being subject to the penalty.

38. *Based on the above, the proposed Project will support: (a) the development of alternatives tools/methodologies to identify illegal users of ground and/or surface water or locating water rights holders who are potentially subject to the penalty for no use, to increase the effectiveness of field inspections; (b) improve information and database related to water rights holders; (c) work in close coordination with a pilot CAS and a JV to improve the control of illegal abstraction: this would include capacity building, metering and information system.*

Dam Safety

39. The governance system in place to manage dam safety is currently not at the level required to face the risks that Chile's dams represent. The relatively high level of risks is related to the following factors: first, the country has more than 100 large dams,³¹ and an unknown number of dams with a height of less than 15 meters that may present substantial risks for the population and economic activities downstream. Second, a large share of those dams are built and managed by the private sector, including irrigators associations; some of the dams are tailings dams, and others relatively old. And, third, Chile's river basins are very short and steep, with economic activities and people never far downstream of the dams.

40. Chile does not have a sufficiently strong dam management system to manage these "systemic risks." The most relevant limitations are the following:

- (a) The legal framework is piecemeal and contains multiple exceptions to the application of dam safety procedures and the associated review process. The role and functions it defines are relatively limited. There is a lack of good practices manuals or guidelines for dam safety.
- (b) The institutions involved in dam safety management, with DGA the lead institution in this field, have insufficient staff and resources to fulfill adequately even their limited role.

41. *Limitations Related to the Legal and Regulatory Framework.* The most relevant law for dam safety management is the Water Code (Art. 41, 122, 171, 172, 294, 295, 304 and 307).³² It indicates the applicable rules as well as the role of DGA in dam safety management (although the law does not explicitly refer to dam safety management, nor mention the role of other institutions that may have a responsibility in managing this type of risk). In practice, the way dam safety has been regulated, at least partially, in Chile is by applying Art. 294 of the Water Code which defines the hydraulic infrastructure of which the construction is subject to DGA approval. (This includes tailing dams and industrial dams.)

42. It is important to highlight that the Hydraulic Infrastructure Directorate (DOH) of MOP which constructs dams, mostly for irrigation purposes, is exempt from DGA's approval process. More generally, a major issue is the coexistence of very diverse regulatory procedures for dam safety management.

³¹ The Chilean chapter of the International Commission for Large Dams (ICOLD-Chile) maintains an inventory of the 107 dams that are considered to be large dams (i.e., more than 15 meters in height). Of these, 12 are concrete dams, 80 are in loose materials "*in materiales sueltos*", and 15 are tailing dams.

³² Article 41 regulates the needs for the DGA approval on projects that impact the natural or artificial flow. Article 294 describes the construction of hydraulic infrastructure that require the approval of DGA's Director, such as (i) reservoirs with a capacity of more than 50,000 m³ or more than 5 m tall; (ii) aqueducts that conduct a water amount of more than 2 m³ per second; (iii) aqueducts that conduct more than 0.5 m³ per second and are close to urban areas, with a distance to the closest city limit of less than 1 km; and (v) siphons and canoes that cross natural channels. Services that are under MOP should only redirect their projects to DGA for its acknowledgement and inclusion in the Public Waters Registry.

Article 307 grants DGA the capacity to inspect major works of which the deterioration and possible destruction could affect third parties, and defines DGA's sanctioning capacity.

43. Dam safety regulation in the Water Code is currently limited to the construction phase. According to Art. 295 of the Water Code, an application decree should define the technical conditions that a hydraulic infrastructure project would have to comply with during the construction and operational phases—yet this application decree has not yet been approved. Its draft, if passed, would represent a step forward in dam safety regulation, as it would expand dam safety requirements in general, and during the operational phase in particular; however, it would only concern new dams, and dams constructed and managed by DOH would apparently still be exempt.

44. In parallel, Law 20304 of 2008 on dam operation during flood alert and emergencies, together with its application decree of 2010, expand DGA functions in dam safety in close coordination with the National Emergency Office of the Ministry of Interior (ONEMI). However, the law is not applied, most probably because it requires compensating private operators of the dams in the event of an erroneous flood prognostic (which does not seem reasonable). In practice, so far only two dams are subject to this law.

45. Finally, Chile does not have good practice manuals or guidelines for carrying out technical tasks related to dam safety management.

46. *Limitations Related to the Institutional Framework.* DGA is the leading agency in dam safety. Other institutions involved include MOP's DOH, ONEMI, the National Mining and Geological Service (SERNAGEOMIN) and the Chilean chapter of the International Commission for Large Dams (ICOLD-Chile). There are some overlapping functions between those institutions.

- (i) Within DGA, the Water Resources Administration Department (responsible for authorization of dam construction, based on the Art. 294 of the Water Code) and the Hydrology Division (responsible for declaration of flood alerts, based on Law 20304) are involved in dam safety. In addition, DGA has 15 regional and two provincial offices.
- (ii) DOH is responsible for the studies, projections, construction, rehabilitation and operation of irrigation infrastructure (including dams) financed with public funds. In carrying out these tasks, it is exempt from DGA oversight. DOH is the unit that represents MOP in ICOLD-Chile.
- (iii) SERNAGEOMIN in the Mining Ministry is responsible for applying the mining law, including giving the authorization for the construction and operation of tailing deposits.
- (iv) ONEMI is in charge of the coordination of the National Civil Protection System. Its role is to plan, coordinate and execute preventive, responsive and rehabilitation actions when faced with collective risk situations, emergencies and disasters, including large flood. It has an important role to play in the application of Law 20304 on dam operation in case of flood emergency.
- (v) ICOLD-Chile was created in 1966. DOH, INDESA and CODELCO compose its governing body, representing the irrigation, hydropower and mining sectors, respectively. ICOLD-Chile maintains an inventory of large dams and is in contact with almost all large dams operators.

47. A major concern related to the institutional framework is the extremely limited capacity of DGA with regards to the number of staff working on dam safety (less than 12 at the national level and none at the regional level). More generally, there is a limited number of professionals trained in dam safety in public institutions. In addition, there is no forum to exchange knowledge and experience related to decision-making for dam safety between DGA and DOH. There is also a relatively weak interaction between the professionals in MOP (especially DGA, less DOH) and the activities of ICOLD-Chile.

48. In this context Chile has a significant potential to strengthen its governance capacity for dam safety, and can take advantage of the lessons learned by other countries, such the USA, Spain and France. *The activities under the proposed Project would provide the building blocks for a modern dam safety risk management system.*

Water Information

49. For a country to make sound decisions regarding water resources management at different levels, high quality information is a requirement. This information should include, among others, data on surface and groundwater hydrology, on water quality, on water uses and on local socioeconomic characteristics (World Bank, 1993). The required level of detail and sophistication in information systems should be determined by basin or aquifer conditions, with higher resolution information needed if water is scarce and climate change impacts are apparent (World Bank, 1993). Additionally, this information and its analysis should be available in a transparent and appropriate manner to enable different stakeholders to make fully informed decisions (World Bank, 2011).

50. In Chile, water resources management is based on a water rights allocation system. These rights are granted to private users by the DGA, the Justice Courts and the Agriculture and livestock service according to water availability and existing water rights. DGA requires updated information on granted water rights and available water resource supply in order to correctly assign water rights and perform its control and enforcement tasks.

51. This information is available in the Public Water Registry (*Catastro Público de Aguas*), as stipulated by Article 122 of the Water Code: “The General Water Directorate should have a Public Water Registry in which all the information related to water shall be included.” This article specifies that “this registry, composed by archives, records, and inventories as stipulated by the bylaw, shall comprise all data, actions and background information related to the resource, to the works linked to its exploitation, to the related water rights, to the property rights constituted and recognized over these resources, or to the existing or future infrastructures enabling the exercise of these rights.”

52. Despite the thorough definition of its function, in practice the Public Water Registry still has incomplete information on: physical water aspects, water quality testing, water rights and water rights transfers (World Bank, 2011, 2013, 2013b). These limiting factors have become a barrier to the DGA in effectively and properly managing Chilean water resources.

53. *Information on Water Availability.* Knowledge of water resources availability is informed by field measurements acquired through a national hydro-meteorological network.

54. According to evaluations of the World Bank,³³ the DGA monitoring network coverage for the generation of meteorological, fluviometric, limnimetric, sedimentic, piezometric and water quality data remains insufficient for several water basins in the country.

55. Furthermore, the low operation and maintenance levels observed for this network threaten the existing monitoring stations. No preventive maintenance plan has been identified for either the data collection equipment or its support infrastructure in the observation stations. According to DGA estimates, at least 60 hydro-meteorological stations need to be refurbished. Overall, the incentive structure for the expansion, monitoring and maintenance of the current data collection network lacks backup from specific national policy.

56. The weak coordination between DGA and external institutions in the generation of hydro-meteorological information presents another barrier: different hydromet monitoring networks produce independent unconsolidated water information. Within DGA, both the Hydrology Division and the Conservation and Water Resources Protection Department run independent in-field measurements while storing the collected information in the same database. Observation network duplicities also affect other public institutions, further confusing data production responsibilities. In order to optimize resources and plan for the expansion of network coverage, a critical assessment of the monitoring network at the national level should be made including information from all institutions and their stations. In addition to assigning roles, this effort shall include a redesign of the data transmission mechanisms to optimize them for a higher level of inter-institutional coordination. *This assessment would be financed by the proposed Project.*

57. Once the data are collected through the observation networks and transmitted to the DGA, they are stored in the National Water Information System (SNIA). The information stored in this platform consists of:

- a) Real-time information on rainfall, temperatures and flow rates, regularly collected by network stations;
- b) Information on historic flow rates, temperatures, rainfall, underground water levels and water quality parameters.

58. This platform presents two limitations: (a) real-time stations provide unofficial³⁴ information, mainly related to water discharge curves; and (b) not all variables are available on this platform. In particular, missing variables include humidity, evaporation rate, radiation, pressure, sediments and reservoir levels.

59. *Information on Water Rights and Water Right Transfers.* The management of water rights is carried out by the Water Resource Administration Department and includes: processing new applications, carrying out feasibility analyses based on existing water resources and allocated

³³ Banco Mundial. 2011. *Diagnóstico de la Gestión de los Recursos Hídricos*. Water Resources, Washington, DC: World Bank.

Banco Mundial. 2013. *Estudio para el mejoramiento del Marco Institucional para la Gestión del Agua*. Water Resources, World Bank, Washington, DC: World Bank.

Banco Mundial. 2014. *Plan para la mejora del marco institucional del agua en Chile*. Washington, DC: World Bank.

³⁴ These data have not yet been validated by the Hydrology Division.

water rights, and drafting final resolutions, through DGA's Regionals offices, that dictate the constitution or denial of a water right.

60. According to current legislation, all granted rights are to be registered by the user in the Water Property Rights Registry (*Registro de Propiedad de Aguas - RPA*) of the property registrar (*Conservador de Bienes Raíces- CBR*). Users can carry out partial or total water transfers directly in the RPA, and the respective property registrar should inform the DGA about these transfers.

61. Besides the DGA, the Agriculture and Livestock Service (*Servicio Agrícola y Ganadero - SAG*) and the local Court (*Tribunales de Justicia*) also have the power to issue water use rights. While SAG is not obligated to submit this information to DGA, the Courts are required to do so.

62. The RPA presents up-to-date information on those water use rights issued by the DGA. Nevertheless, the RPA does not provide a good history of water right transfers issued by the CBR since these entities do not consistently communicate this information the DGA. Moreover, the hard-copy information provided by the local CBRs, the SAG and the Courts is not rapidly processed for incorporation in the system and is usually stored in its original format.

63. As reported in different studies, (the World Bank 2011, 2013) the lack of up-to-date or complete information on existing water rights and water rights transfers in the CPA and the RPA consists one of the main barriers for water resources management in Chile.

64. *Information Management at the Central and Regional Levels.* The current distribution of the responsibilities in the DGA at the central and regional level for the generation, processing and analysis of water resources data presents another key issue for information management. To date, the role of the Regional Directions of the DGA has not been clearly defined, except in the management of the Public Registry of Applications (*Registro Público de Solicitudes*), where applications for new water use rights are registered by an appointed public employee of the regional office.

65. In order to optimize the management of water resources information, the role of the regional DGA for the generation, processing and analysis of water information should be enhanced to take advantage of the existing decentralized network and its capacity.

66. Since 2011, the Water Resource Information Center (*Centro de Información de Recursos Hídricos – CIRH*) has been working on the development of a National Water Information System (*Sistema Nacional de Información de Agua - SNIA*) aggregating the information needs of the different management units within the DGA.

67. In order to define, prioritize, validate and streamline the improvement of DGA's information systems, the CIRH has been working to define different components of the DGA's information needs. In particular, the key components are: the business architecture, the process architecture, the technological architecture, the data architecture, the processes and services architecture, the working team architecture (employees) and the Information Technology strategic plan.

68. Due to resources limitations (both financial and human), the CIRH has only partially completed these tasks. In the light of the increasing and changing information demands and of the

planned incorporation of new structural and functional changes within the DGA, it is important to ensure that the development process of the SNIA integrates and responds to these new requirements. For example, new tools for water management are being developed by the DGA, such as new water abstractions control methods and dam safety monitoring, and these tools should communicate with the SNIA platform for optimal and integrated information sharing. This implies the definition of an information technology and strategic development communication plan for DGA that updates and improves the current strategy for the technological development of the institution.

69. *The proposed Project would support, at national level and, in more depth, in the 2 pilot basins: (a) DGA's organizational strengthening and capacity building for the management of the information system; (b) upgrade and develop the national water information system; (c) improve data collection and transmission.*

B. INFRASTRUCTURE PLANNING AND CONCESSION

70. A pillar of the Government program for sustained and shared economic growth, but also to improve the quality of life of its citizens, is to bridge the public infrastructure gap with high-income countries. MOP's 3030 Agenda lays out the challenges that the country faces in the field of public infrastructure, and identifies the investments required to close this infrastructure gap by 2030, while prioritizing inclusion and regional integration to reach an average per capita income of USD 30,000. The Agenda seeks to increase investments in public infrastructure from the current level of 2.5% to 3.5% of Gross Domestic Product (GDP) per year. Infrastructure investments totaling USD 37 billion are planned to be carried out between 2014 and 2021, mainly in the field of transport, dams and coastal development. Investments of about USD 23.8 billion are expected to be carried out directly by the MOP, and the remaining USD 13.3 billion through concessions.

71. MOP's system for planning infrastructure investments comprises: the National Infrastructure and Water Master Plan that uses a longer-term strategic approach and coordinates sector policies at the national level; the Regional Infrastructure and Water Resources Plans for the medium-term, taking into account the particularities and requirements of the respective region; and Special Plans for particular purposes. This system identifies the infrastructure projects from a national, regional or local perspective that contribute to achieving the long-term objectives set by the Master Plan and other policy documents, such as MOP's 3030 Agenda.

72. Infrastructure concessions in Chile have been a successful scheme to meet the challenges of increasing competitiveness and reducing the existing investment gap. In the early 1990s, the Government of Chile took stock of its infrastructure needs and estimated its infrastructure deficit at USD 11 billion (between 1995-2000) with additional losses due to lack of competitiveness of USD 1.7 billion annually. In determining how to respond to this need for massive investments and significant improvements in service delivery, the Government also recognized that the public sector did not have the resources to carry out the major works required, nor could it commit its budgetary resources exclusively to infrastructure investments given the country's social investment needs.

73. Private sector innovation in design and operation plus investment financing was a major shift in the paradigm of infrastructure service provision. The Government first called on the private

sector to take part in the construction, maintenance and operation of major roads. Thus, the Chilean Concessions System was based on user fee payments as the main source of funding and recovery of investments. In the last ten years, the concessions expanded to more sophisticated sectors related to the management of services associated to infrastructure (including health). Chile now has an extensive concession program encompassing roads, ports, railroads, bridges, tunnels, reservoirs, prisons, canals, hospitals and even public plazas and sports stadiums, among others. At the same time, the concession model also evolved into Public-Private Partnership schemes to address social infrastructure projects where the revenues from user charges were not sufficient for cost recovery. Chile's concession program uses a variety of structures to allocate risk and to achieve financial-economic equilibrium and the government was able to introduce innovative mechanisms such as minimum revenue guarantees in the bidding process and a least present value schemes with variable contract terms. Chile has also extensively developed infrastructure finance schemes such as project bonds using pension funds.

74. As for the overall results, to date the concession system has tendered a total of 63 projects totaling approximately USD 19,400 million.³⁵ These projects are in different stages: i.e., Operation (45) Construction (9), Operation and Construction simultaneously (9) or contract finalized (see figure 1). As shown in figure 2, transport infrastructure and in particular roads represent a large share of total concession investments.

³⁵ The source of information for the estimated materialized investment is Tax Analysis and Financial Unit of the CCOP, with information updated to August 8, 2014 for projects that are concessioned. It is not considered investment in projects that are in the process of adjudication, tendering, development or feasibility study. This amount including the estimated investment, on the same date, reaches USD 14,978,000.

Figure A.5.1: Contracts by Phase.

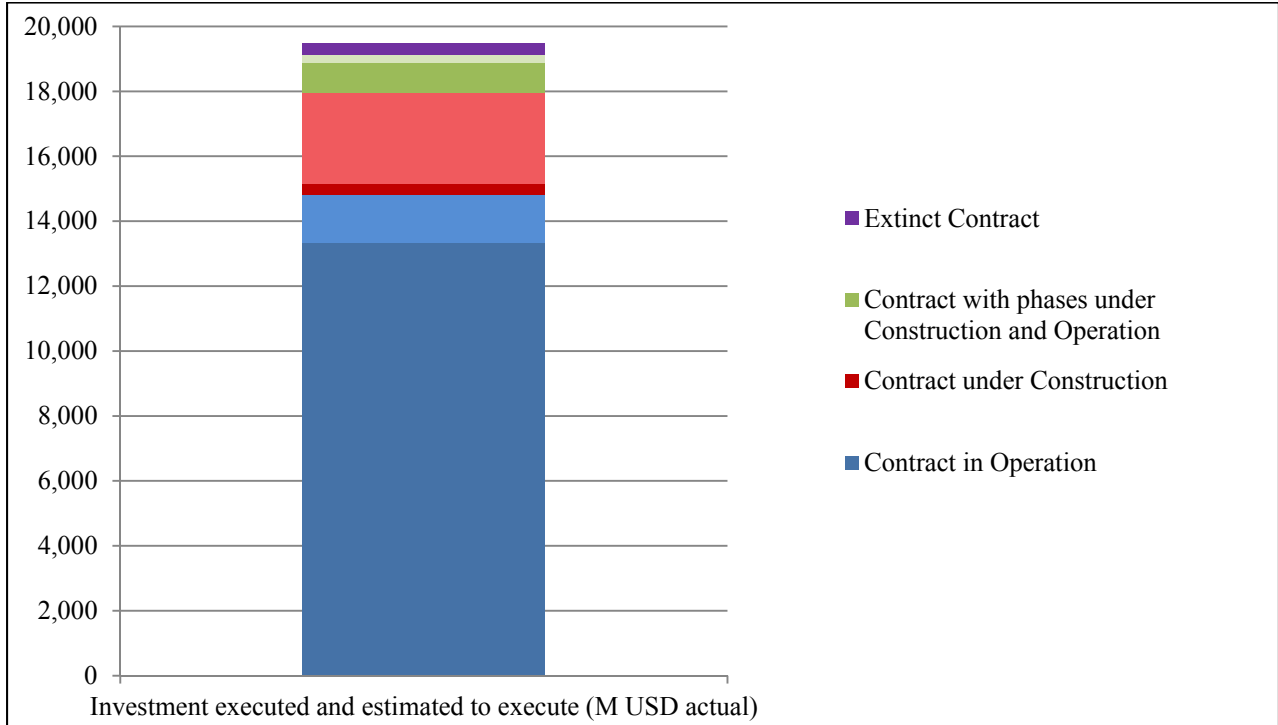


Figure A.5.2: Contracts in Operation, by Sector.

