UN WATER

Chile

UN-Water Country Brief

		year
Total population (UN Population Division)	**17.42** million inhabitants	2012
Total area	**756 100** km²	
Population density	**23** inhabitants/km²	2012
Human Development Index (UNDP) (between 0 and 1; 1 is highest) Country rank (total 186 countries; 1 is highest) Gender Inequality Index (0 is equality between women and men; 1 is least equality)	**0.819** **40** **0.36**	2012
Water, sanitation and hygiene-related deaths % of total deaths (WHO)	**0.7** %	2004
Long-term average annual precipitation (CRU CL 2.0)	**1 522** mm/year	
Long-term average actual renewable water resources (FAO AQUASTAT)	**922 000** million m³/year	
Actual annual renewable water resources per capita (FAO AQUASTAT)	**52 928** m³/inhabitant	2012
% of total actual renewable freshwater resources withdrawn (MDG Water Indicator) (FAO AQUASTAT)	**2.9** %	2007
Groundwater withdrawal for irrigation as % of total freshwater for irrigation (OECD and FAO AQUASTAT)	**5.9** %	2007
Total area equipped for irrigation (Instituto Interamericano de Cooperación para la Agricultura, IICA, 2010)	**1 199 000** ha	2007
% of the cultivated area equipped for irrigation (FAO FAOSTAT, FAO AQUASTAT and IICA)	**70** %	2007
Ramsar sites (Ramsar) – number – total area	**12** sites **358 989** hectares	2013

Total water withdrawal by sector
34 430 million m³ in 2006

- **83.0%** Agricultural
  - 46.6% Irrigated crops
  - 35.8% Aquaculture
  - 0.3% Irrigated forest plantations
  - 0.3% Livestock cleaning and watering
- **13.4%** Industrial
  - 7.5% Industrial (excl. mining and cooling)
  - 5.6% Mining
  - 0.3% Cooling of thermoelectric plants
- **3.6%** Municipal

The Money Stream

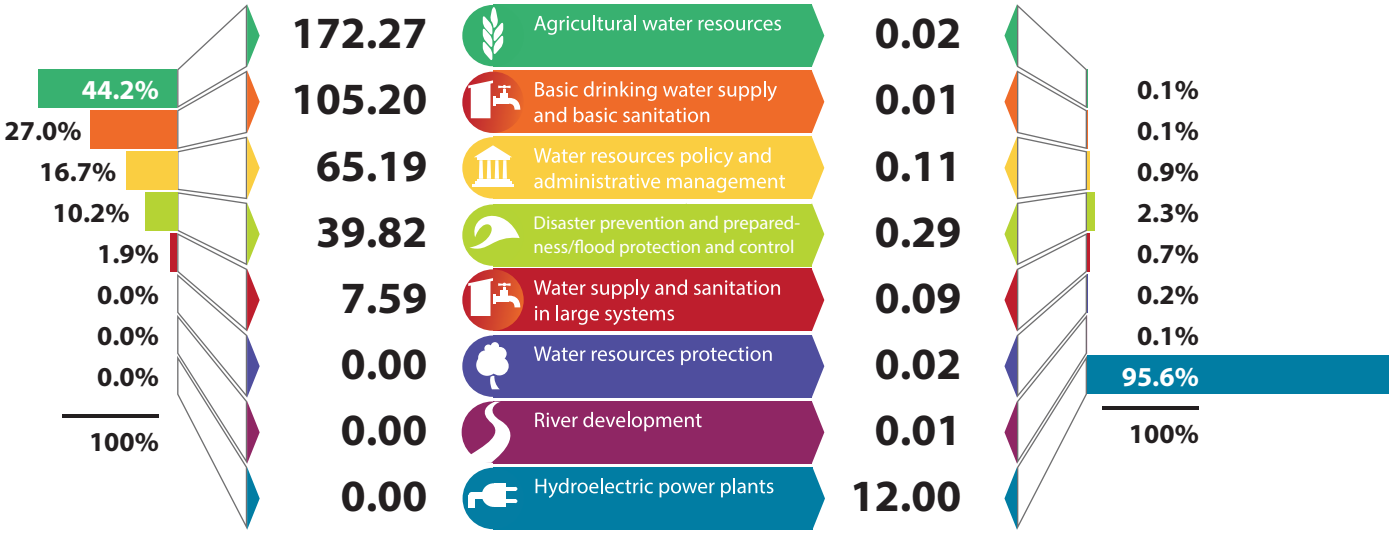
During 2002-2011, the government invested US$ 390.07 million (in constant 2010 US$) on average per year on water-related infrastructure and programmes. During the same period, official development assistance (ODA) gross disbursements amounted to US$ 12.55 million on average per year.

Throughout the same period the government's total water-related investments accounted for an estimated 1.8 percent of the government's total expenditures, with a continuous increment since 2005. Over the period 2002 to 2011, almost three quarters of the government's expenditures were channeled into two sectors: agricultural water resources (44.2 percent) and basic drinking water supply and sanitation (27 percent). Throughout this period, 95.6 percent of official development assistance (ODA) disbursements was channeled into hydroelectric power plants.

Estimated % of water-related investment to total government expenditure 2002-2011

1.8%

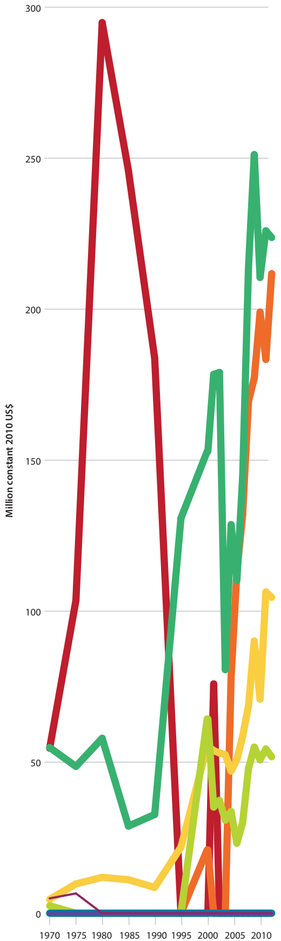
Annual average government expenditure during the period 2004 - 2011 and budget for the years 2002 & 2003
(million constant 2010 US$)



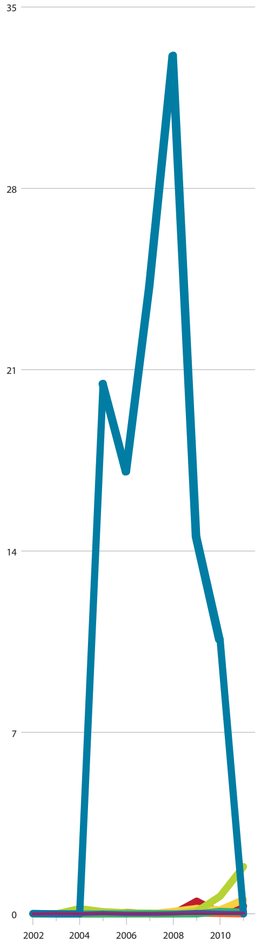
Annual average official development assistance gross disbursements during the period 2002 - 2011
(million constant 2010 US$)

Status and Trends

Government expenditure during the period 2004–2011 and budget for the years 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2002, 2003 & 2012
(million constant 2010 US$)



Official development assistance gross disbursements for the period 2002 - 2011
(million constant 2010 US$)



Water-related government investments during the period 1970 to 2012:

- During the mid 1970s water supply and sanitation large systems experienced an increase in investment with a peak in 1980.
- From 1995, the Government of Chile gave progressively increasing emphasis to agricultural water resources, basic drinking water supply and sanitation, water resources policy and administrative management, as well as to disaster prevention and preparedness.

Water-related official development assistance during the period 2002 to 2011:

- Some 95 percent of ODA has been channeled into hydroelectric power plants, with a peak occurring in 2008.

Actual expenditure refers to the amount spent by the government during a given year. Where actual expenditure is not available, the government budget is used and refers to the amount that the government reportedly budgeted for the given year. The OECD Creditor Reporting System categories were chosen for the collection of these water-related investments and the data was obtained by the WCB project through in-country research in cooperation with the government (during 2012), while ODA data stems from the OECD Creditor Reporting System (collected January 2013).

Water supply and sanitation in large systems: Water desalination plants; intakes, storage, treatment, pumping stations, conveyance and distribution systems; sewerage; domestic and industrial wastewater treatment plants.

Basic drinking water supply and basic sanitation: Water supply and sanitation through low-cost technologies such as hand-pumps, spring catchment, gravity-fed systems, rainwater collection, storage tanks, small distribution systems; latrines, small-bore sewers, on-site disposal (septic tanks).

Water resources policy and administrative management: Water sector policy, planning and programmes; water legislation and management; institution capacity building and advice; water supply assessments and studies; groundwater, water quality and watershed studies; hydrogeology. Excluding agricultural water resources.

Disaster prevention and preparedness/Flood protection and control: Disaster risk reduction activities such as developing knowledge, natural risks cartography, legal norms for construction; early warning systems; emergency contingency stocks and contingency planning including preparations for forced displacement. Floods from rivers or the sea; including sea water intrusion control and sea level rise related activities.

Agricultural water resources: Irrigation, reservoirs, hydraulic structures, groundwater exploitation for agricultural use.

Hydroelectric power plants: Including power-generating river barrages.

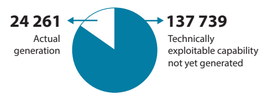
Water resources protection: Inland surface waters (rivers, lakes, etc.); conservation and rehabilitation of groundwater; prevention of water contamination from agrochemicals, industrial effluents.

River development: Integrated river basin projects; river flow control; dams and reservoirs. Excluding dams primarily for irrigation and hydropower and activities related to river transport.

Energy for Water, Water for Energy

Impact for development
With an installed capacity of 5 025 MW, Chile generated 24 261 GWh in 2008, which represents around 15 percent of the nation's hydropower technically exploitable capability. Moreover, in Chile, traditional renewable energies have significant relevance to water resources with mini-hydropower development currently being one of the main water-related priorities.

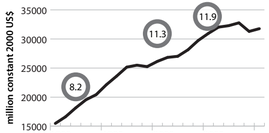
Hydropower capacity and generation, 2008, in GWh/year (World Energy Council)



Water Intensity in Industry

Impact for development
Water withdrawals from industry have almost tripled since 1975. During 1992 to 2000, the value generated by industry per m^3 of water increased by 4 percent annually, and during 2000 to 2005 this value increased by 1 percent annually. Although industry is using water efficiently, there are sea and river basin pollution episodes related to industrial water discharges, which remain a matter of concern in specific areas.

Value generated by industry per m^3 of water
(FAO AQUASTAT, World Bank)



Value generated by industry in constant 2000 US$ per m^3 of water

Value added by industry in million constant 2000 US$

Environment and Ecosystem Health

Impact for development
Chile has made significant progress on environmental conservation. The main pressures on water bodies correspond to alterations in their availability and quality, the most prominent being: extraction of water, effluent discharges and morphological alterations. The north of the country and the coastal lakes have a greater pollution vulnerability.

Water quality index 2010
(UNEP-GEMS/Water)

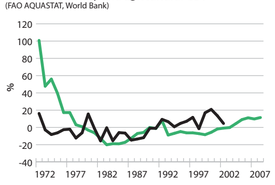
A score of 100 indicates that water quality targets are met for all five parameters (DO, pH, conductivity, total nitrogen, and total phosphorus).

Collected municipal wastewater
(total 1 066 million m^3 in 2011)
(Superintendencia de Servicios Sanitarios)

Irrigated Agriculture

Impact for development
Agriculture is an important sector of the Chilean economy, accounting for approximately 5.1 percent of gross domestic product, and employing approximately 13.2 percent of the labour force. In 2012, women accounted for 15 percent of the economically active population in agriculture. Key irrigated agricultural crops in Chile are fruits, grapes, vegetables and cereal crops, some of which underpin key export industries, as well as fodder and pasture.

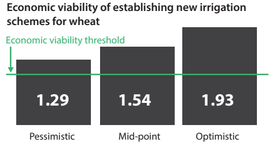
Rainfall variability and agricultural GDP
(FAO AQUASTAT, World Bank)



National rainfall index variability (percentage of deviation from average national rainfall index)

Variability in agricultural GDP (percentage of deviation from trend of agricultural goods produced per km^2 of agricultural land)

Economic viability of establishing new irrigation schemes for wheat



The economic viability of new irrigation schemes is highly influenced by an ability to achieve agronomic practice productivity gains in addition to gains directly related to a move from dryland cropping to irrigated cropping. The analysis of expanding irrigation for a crop, such as wheat, indicates that it is likely to be economically viable; even where relatively high capital and operating costs are assumed, when converting existing cleared agricultural land and water is available for expansion of irrigation. It should be noted that this analysis does not include labour costs associated with capital investments in establishing infrastructure systems and any costs from negative externalities, such as, increased pollution loads into waterway associated with expanded irrigation. Inclusion of these costs will result in declines in the viability of expanding irrigation. Ultimately, every potential expansion will have different benefits and costs, and this analysis should be considered as indicative only.

Major public investments have been made in agriculture, through the: formulation, construction and operation of dams and major irrigation channels systems (until the 1980s); costs reimbursements to public water operators for building and maintenance of irrigation systems (since 1981); subsidies on irrigation and drainage private investments (since 1986); irrigation credits for small farmers (since the 1990s) and indigenous people (more recently).

Drinking Water Supply and Sanitation

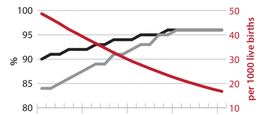
Impact for development
Investments since the early 1990s have contributed to the 66 percent decline in the rate of under 5 child mortality since 1990. In general, improved water and sanitation infrastructure and services provide multiple benefits to the local population for health (decreased mortality) and labour productivity (lower workplace absenteeism). They can also underpin confidence and expand markets for industries such as tourism. Globally, it is estimated that 88 percent of diarrheal diseases are caused by water, sanitation and hygiene factors.

Ratification of the International Covenant on Economic, Social and Cultural Rights (ICESCR):
10 February 1972

(The right to water is implicit within the right to an adequate standard of living and inextricably related to the right to the highest attainable standard of health outlined in the ICESCR.)

Since 1990, use of improved drinking water sources in urban areas has been stable at around 99 percent of the population, while in rural areas it has increased from 48 percent in 1990 to 75 percent in 2010, but there is still a gap to fill in rural areas with 25 percent of the population not having use of an improved drinking water source. For sanitation facilities, there has been a significant improvement in services since 1990. Currently, 98 percent of urban residents use improved sanitation facilities. Over the same period, significant improvements have occurred in rural areas (up from 48 percent to 83 percent). However, this gap between services in urban and rural areas will continue to create risks to health and labour productivity in rural areas.

Access to drinking water and sanitation & under-5 child mortality
(UN Inter-agency Group for Child Mortality Estimation (IGME) and WHO/UNICEF Joint Monitoring Programme)

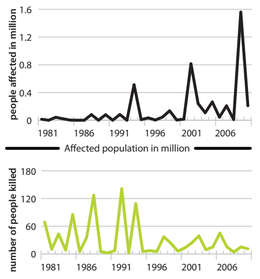


Improved drinking water source
Improved sanitation facilities (both indicators above in % of total population)
Under 5 child mortality rate (probability of dying by age 5 per 1000 live births)

Water - related Disasters*

Impact for development
Between 1981 and 2010, hydro-meteorological events in Chile have affected over 4.5 million people and caused US$ 44 million worth of damage. New climate trends are showing that temperatures in the Central Valley of Chile have risen, while they have tended to drop in the ocean and coast. The national projections point to an overall increase in temperature towards the end of this century. Government investments towards disaster prevention and preparedness, especially floods (riverbed management facilities, urban sewage system upgrading), started during the last decade.

Water-related disasters impacts
(Universidad de Chile, UNISDR)



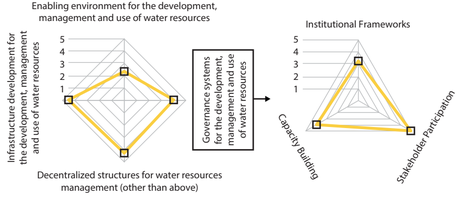
* 'Water-related disasters' within the scope of this WCB study do not include droughts.

Tracking Water Governance

Impact for development
Chile adopted the National Water Resources Strategy in March 2013 (that updates the National Policy on Water of 1999). The Water Code (1981) establishes that water is national property for public use, and in 2010, the government recognized the access to safe and clean drinking water as a human right. Chile has increased its public disbursements on water resources policy and administrative management due to: major water resources public investment; more investment projects (monitoring and follow up); new institutions (environment); the need for regulations; better monitoring of water withdrawal, icecaps and water bodies.

While on most of Chile's governance survey scores rank high, its lowest scores are for the 'enabling environment' category, which assesses: water resources policy and management plans, water efficiency in integrated water resources management plan, transboundary water resources management agreements, among others.

UN-Water survey on integrated approaches in the development, management and use of water resources governance, 2012 (UN-Water)



1 Under development
2 Developed but implementation not yet started
3 Implementation started
4 Implementation advanced
5 Fully implemented

Rapid Assessment

Overall

Pressures on water

Though at a national level the pressure on water is low, in certain regions due to macroeconomic policies, the pressure on water resources (mainly on alterations in its availability and quality) has significantly increased during the last three decades. In addition, exotic and invasive aquatic species and habitat degradation cause water quality and ecological pressures. Despite the significant progress in public health, environmental conservation and development of the institutional framework, Chile still faces challenges in managing its water. These challenges include among others, efficiency of irrigation, sustainable use of hydropower potential, flood management, industrial discharge hazards, rural access to drinking water and sanitation services, water rights allocation for vulnerable groups, groundwater withdrawal control, water quality standards and monitoring, as well as water ecosystems services maintenance.

Investments

Government investments on water resources have increased, aimed primarily at agriculture, basic drinking water supply and basic sanitation, and water policy and administrative management. Public investments have specifically targeted: hydrological regulation capacity; irrigation efficiency; drinking water coverage in rural areas; watershed embedment; water quality regulation framework, water user organization; environmental standards of investment projects; and water rights ownership. ODA gross disbursments have been focused mainly on hydroelectric power plants.

Assessments

		Data Quality
Irrigated agriculture	●●●●○	★★★★☆ Data is accessible and updated.
Major public investments have been made on new irrigation schemes to move from rainfed to irrigated cropping.		
Drinking water supply and sanitation	●●●○○	★★★★☆ Data is accessible and updated but data on drinking water quality is limited.
Urban areas have experienced a stable rate of use to an improved drinking water source and a significant improvement in the use of improved sanitation facilities. Rural areas have also experienced significant improvements in drinking water supply and sanitation. Concurrently, the under-5 child mortality rate has declined considerably. Nevertheless a significant gap between rural and urban areas in terms of use of an improved drinking water source and of improved sanitation facilities remains.		
Water intensity in industry	●●○○○	★★★☆☆ Data is not readily available.
Through the Environment General Bases Law, Chile has established a regulatory framework for water discharge to sewer systems, as well as to groundwater and surface water. However, the water demand for industrial use has been increasing continuously, particularly in mining, and attention must be paid to industrial discharge.		
Water-related disasters	●●○○○	★★☆☆☆ A detailed disaster database is not available
Climate change-related public investments began in the last decade for disaster prevention and preparedness, especially floods, which included riverbed management facilities and urban sewage system upgrading.		
Water for energy, energy for water	●○○○○	★★☆☆☆ Data is not readily available.
Chile has a large untapped technically exploitable hydropower potential, yet the environment and social consequences are contested. Management and legal challenges present a challenge to hydropower exploitation.		
Environment and ecosystem health	●●●●○	★★★☆☆ Data is accessible and updated with regards to the environmental impact assessment of major projects, new environmental regulation, water chemical quality, protected areas, endangered species, emission and transfer of air pollutants and residues. Water bio-indicators and ecosystem health assessment tools still need to be implemented.
The country has made significant progress on the conservation of the environment such as, improvements to the regulation of effluent discharges to groundwater and surface water, a system of new nationally and privately protected zones, issuance of an endangered species list, and minimum ecological flow restrictions for additional water right allocation. There is still a lack of secondary guidelines to establish thresholds for ecosystem health conservation.		
Tracking governance	●●●●○	★★★☆☆ Complete data is accessible and updated on the main river basin (Master Plans). The official data on water user organizations needs to be completed and updated. There is no data available on the equity and human rights on sanitation and drinking water within UN-Water GLAAS Report 2012.
In Chile, there has been an important development of the institutional framework on water and since 2005 the government has increased its investments in water-related matters. Chile adopted a National Water Resources Strategy in March 2013.		

Legend:

The rapid assessment of the situation above, based on available data, was established in conjunction with in-country experts and officials. It provides an overview of trends according to the following:

- ●○○○○ trends are of significant concern
- ●●○○○ trends are of concern
- ●●●○○ trends are stable or, progressing on certain issues but not on others
- ●●●●○ trends show some measure of improvement in all relevant indicators assessed
- ●●●●● trends show significant improvement and there is no concern
- ○○○○○ insufficient data

Accurate assessments of progress require relevant, accurate and timely data. The above data quality assessment ranges from:

★☆☆☆☆ very poor ➡ ★★★★★ very good

Data Concerns

Data is a vital input to water management and investment in water-related infrastructure and projects. Data and available research for Chile is relatively good when compared to many developing nations. However, the lack of published economic data on irrigation development (e.g. infrastructure costs, operating costs, crop values etc.) makes water-related investment decisions inherently more complex and investments more risky for investors.

Modest investments in coordinated data collection, collation, analysis and dissemination is vital to demonstrate the benefits of water-related investments to governments, donors and ultimately private capital investors.

It is to be noted that it is virtually impossible to find national-level gender-disaggregated data for almost all themes contained in the UN-Water Country Briefs.

UN WATER

This project was implemented by the AQUASTAT Programme of the Food and Agriculture Organization of the United Nations (FAO) on behalf of UN-Water with financial support from United States Department of State (USDS). Brief produced: 19 June 2013

Additional information on the project, data and methodologies can be accessed at:

http://www.unwater.org/WaterCountryBriefs.html

Disclaimers

- The most recent and updated information can be found in the original databases cited throughout.
- The rapid assessment methodology presented here is an advocacy tool designed to generate debate and attention to the issues, and is developed in conjunction with national government focal points.
- Data presented herein stems either from existing databases or was collected from national reports, experts and institutions, and in some cases raw data underwent various manipulations to categorize the information for this presentation.
- Due to data limitations, the investment-related estimates may not include water-related investments that are counted under other categories of investments, and some investment categories (ie: disaster prevention and preparedness) may include some investments that are not directly water-related. Moreover, water being a crosscutting issue, investments in other parts of the government (not calculated here) may also benefit water management.
- The words investments / invested / funded for ODA refer to gross disbursements of ODA according to the OECD definitions. The words investments / invested / funded for government refer to government expenditure (2004 - 2011) and budget (1970, 1975, 1980, 1985, 1990, 1995, 2000, 2002, 2003 & 2012). In addition, investment data and analysis do not include any other forms of investment (such as, private sector investments).
- The benefit-cost analysis on expansion of irrigation is based on very limited data and any decisions should be based on detailed cost-benefit analysis that incorporates all relevant local data.