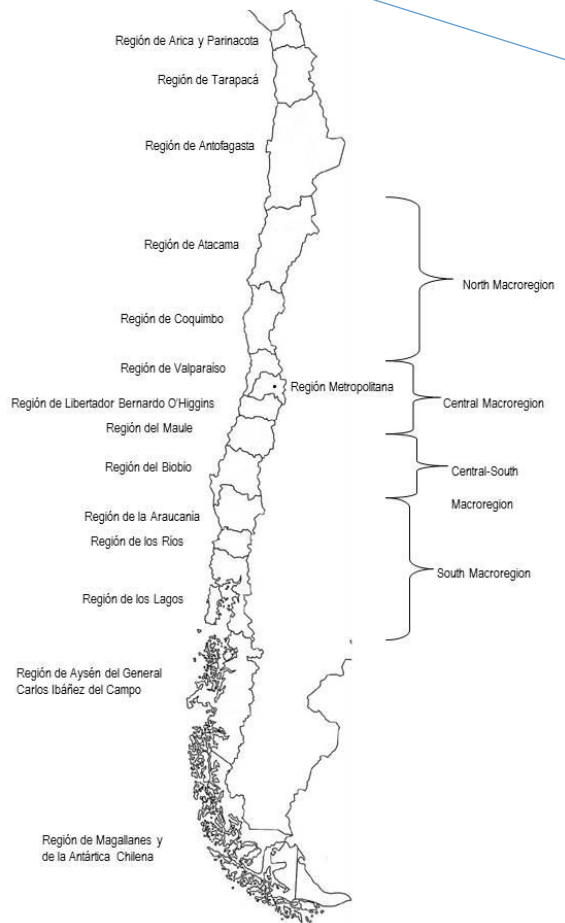


## Regional Economic Workshop **Water tariffs and affordability**

# Water pricing in Chile: Insuring Cost Recovery, Affordability, and Human Right to Water and Sanitation

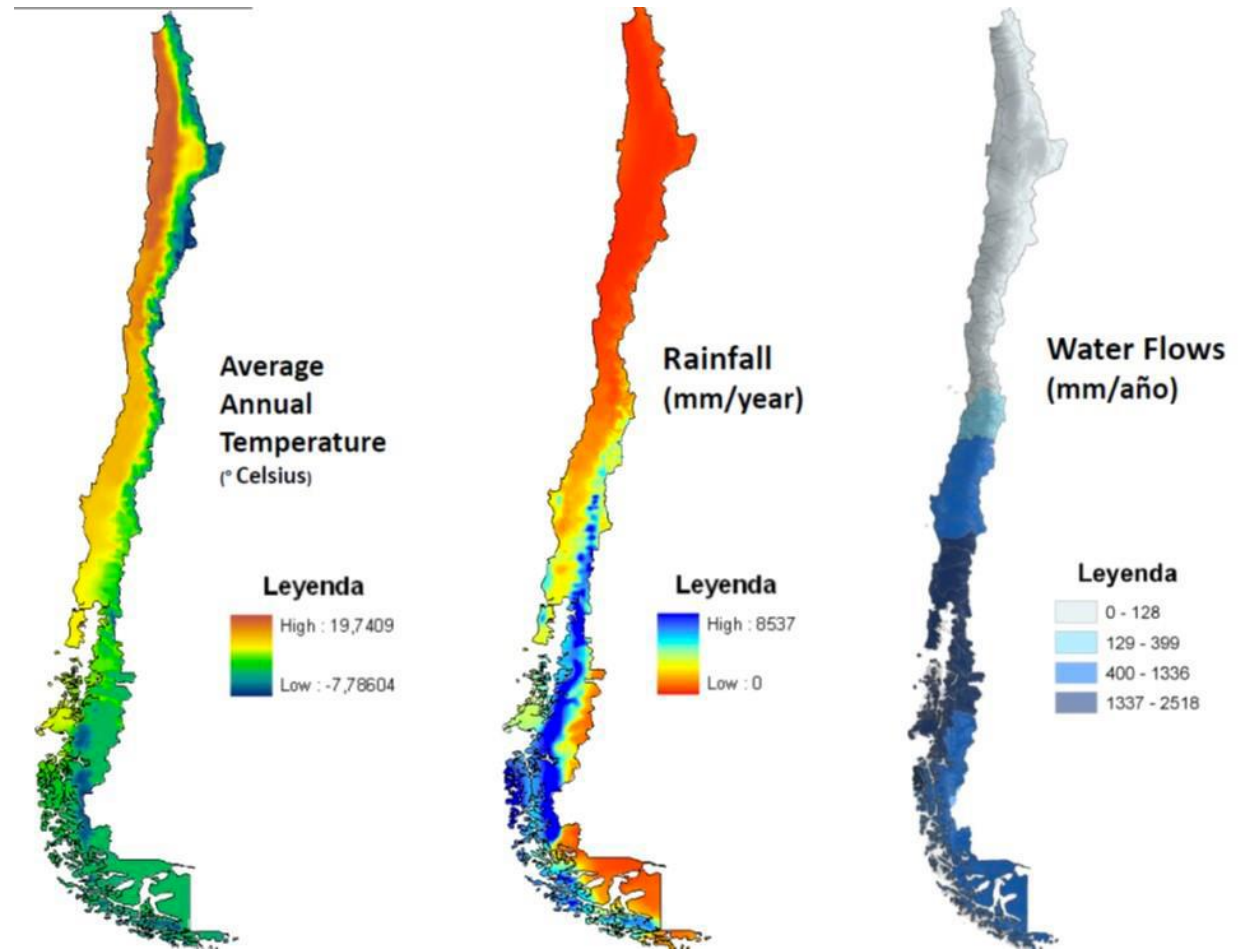
# Chile



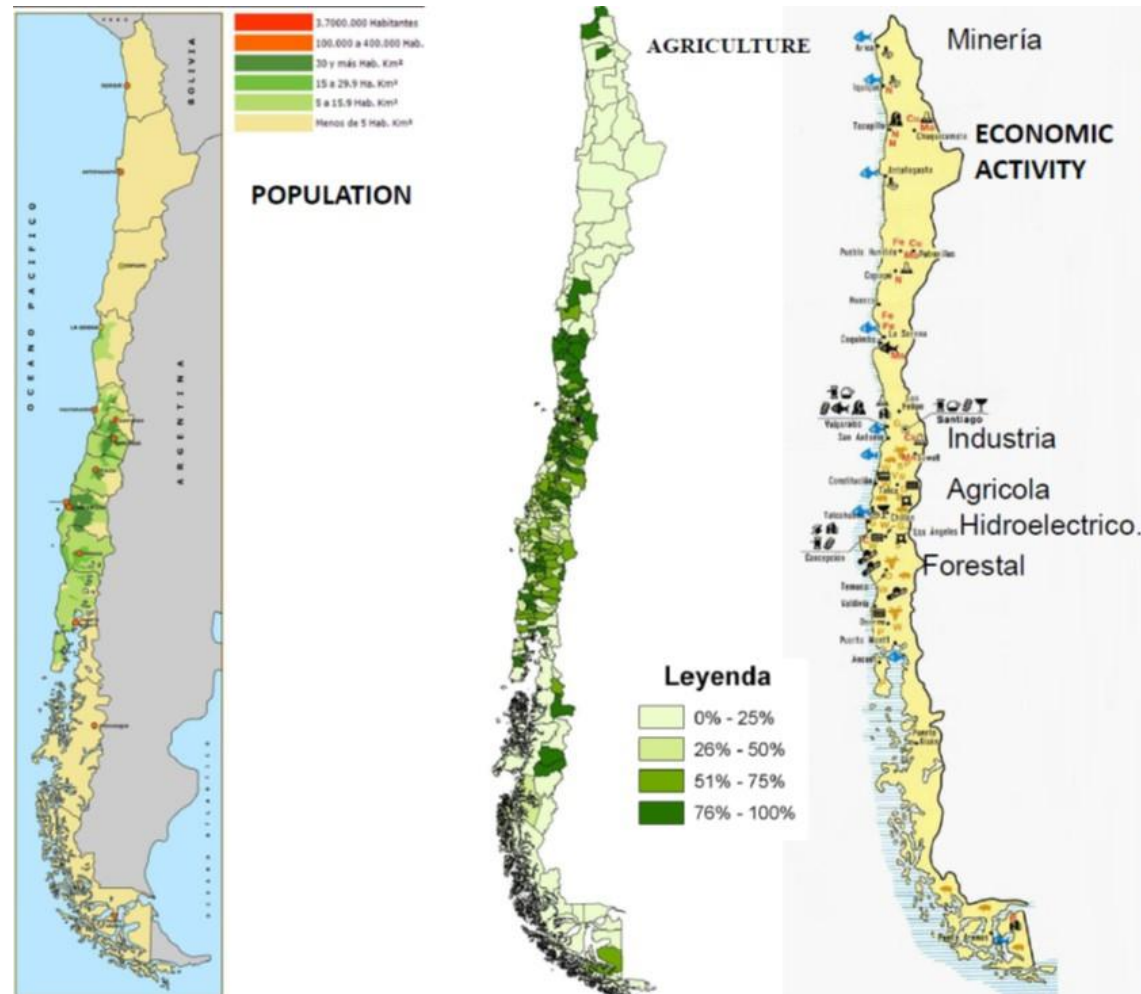
# Chile's Demographic Characteristics

- 4,630 km from lat. 18°S to Cape Horn (lat. 56°S)
- Approximately 17 million habitants, 89% urban
- Population growth rate : 1,13%
- Fertility rate: 2,16 per woman
- Infant mortality rate : 9.4/1000
- Life expectancy : 75.94 years
- Population density per km<sup>2</sup> : 20
- Literacy: 95%
  
- Per capita income: US \$15,730 ≈ € 13.830
- Poverty reduction: 38.6% 1990 – 14.4% (2013)
- Highest income inequality of OECD Countries

# Climatic and Hydrologic Characteristics



# Demographic and Productive Spatial Distribution



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# Urban Water Pricing Regulatory Framework

- Legal Framework (1988)
  - Separated regulatory and supervisory functions from service provider;
  - Establishes efficient tariffs so as to allow operators
    - To finance operation,
    - To finance investment requirements, and
    - To obtain a minimum return on their investments;
  - Established a subsidy to insure affordability for low-income families.

# Urban Water Pricing Regulatory Framework

- New regulatory regime considered concessions to establish, build and operate water and sanitation services by private providers
  - Concession holder is obliged to satisfy
    - Water demands
    - water quality standards,
  - Implement required investment plans so as to meet increasing water demand ensuring supply continuity and quality of service.
    - No water cuts or rationing during the recent 8 year drought
  - WSS provider that does not satisfy these requirements under normal conditions, loses the concession
    - No indemnization

# Urban Water Pricing Regulatory Framework

- State's Superintendencia de Servicios Sanitarios (SISS) role is to
  - Grant WSS concessions;
  - Monitor WSS's compliance of the development plan;
  - Set efficient tariffs that ensures full cost recovery; and
  - Monitor the continuity and quality of the water and sanitation provision service.



# Tariff Setting model

## Objectives

- Economic efficiency
- Water conservation incentives
- Equity
- Affordability

Policy makers face the challenge of setting water tariffs which deal with multiple objectives.

# Tariff Setting in Chile

## Two Part Tariff (Coase Solution)

- **Fixed charge** (\$) function of metering costs and water connection diameter
- **Variable charge** (\$/m<sup>3</sup>) satisfies efficiency criteria
  - **Non Peak Variable charge**
    - Operation and Distribution Costs
  - **Peak Variable charge**
    - Operation Costs

# Tariff Setting in Chile

## Efficient Model Firm

Firm that starts from zero  
Uses the necessary assets  
To offer water and sanitation service  
With an investment plan

# Tariff Setting in Chile

$$\tau = \frac{AI + OC + MR + T}{C}$$

*AI*: annualized value of the required investments.

*OC*: annual operating and maintenance costs.

*MR*: minimum guaranteed returns (only over WSS investments)

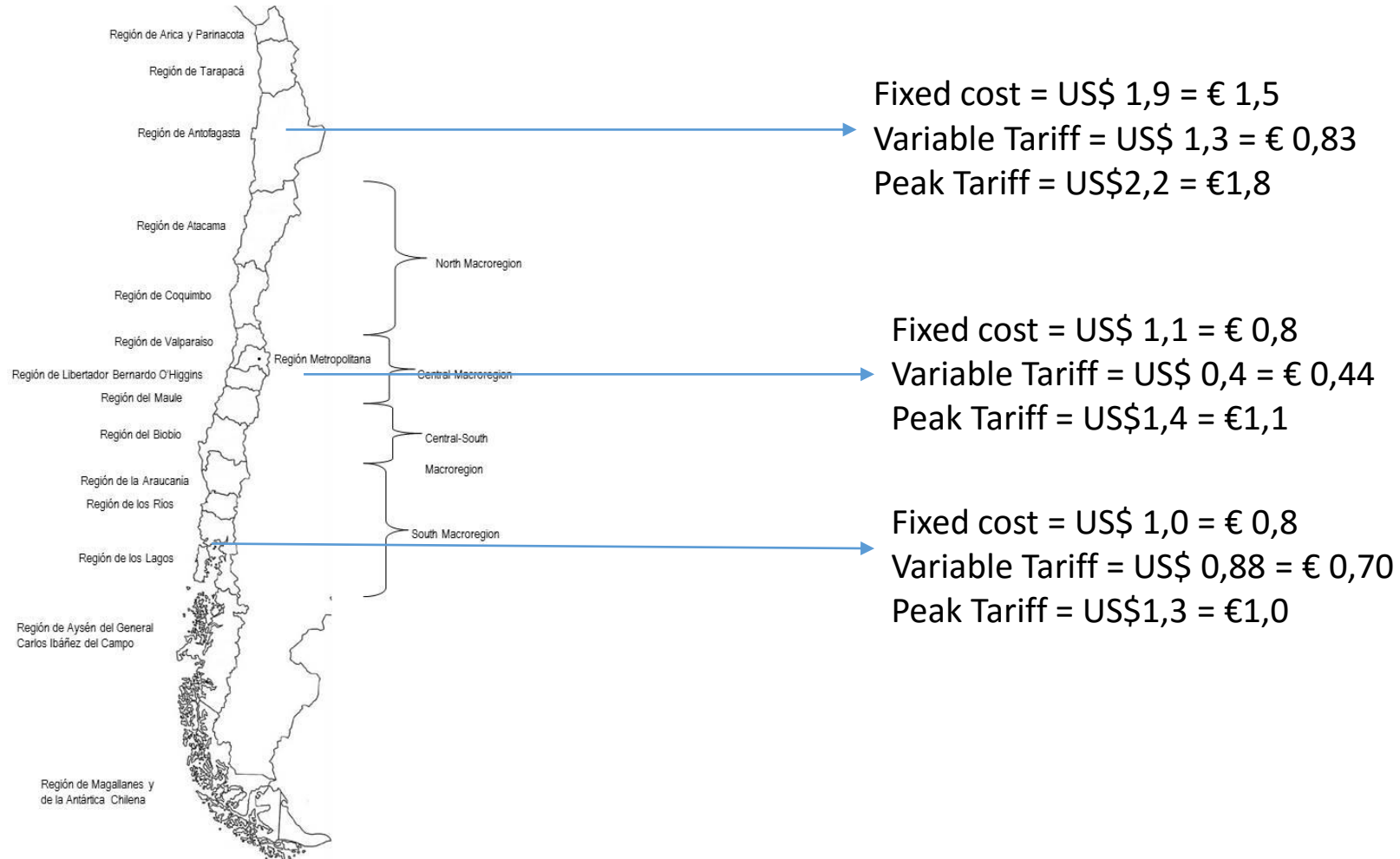
*T*: taxes

*C*: total annual projected water consumption for the next 5 years in the concession area.

*AI* considers water's scarcity value

- Market WR value

# Tariffs 2014



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# Equity and Affordability

## Affordability criteria:

- Provision of subsidies directly to the most vulnerable households which are classified based on annual survey.
- Central government transfers the block subsidy to the municipalities.
- The payment share ranges from
  - 15% to 85% of the water bill for low income households
  - 100% for vulnerable households
- Subsidy covers a consumption of up to 15 m<sup>3</sup>/month.

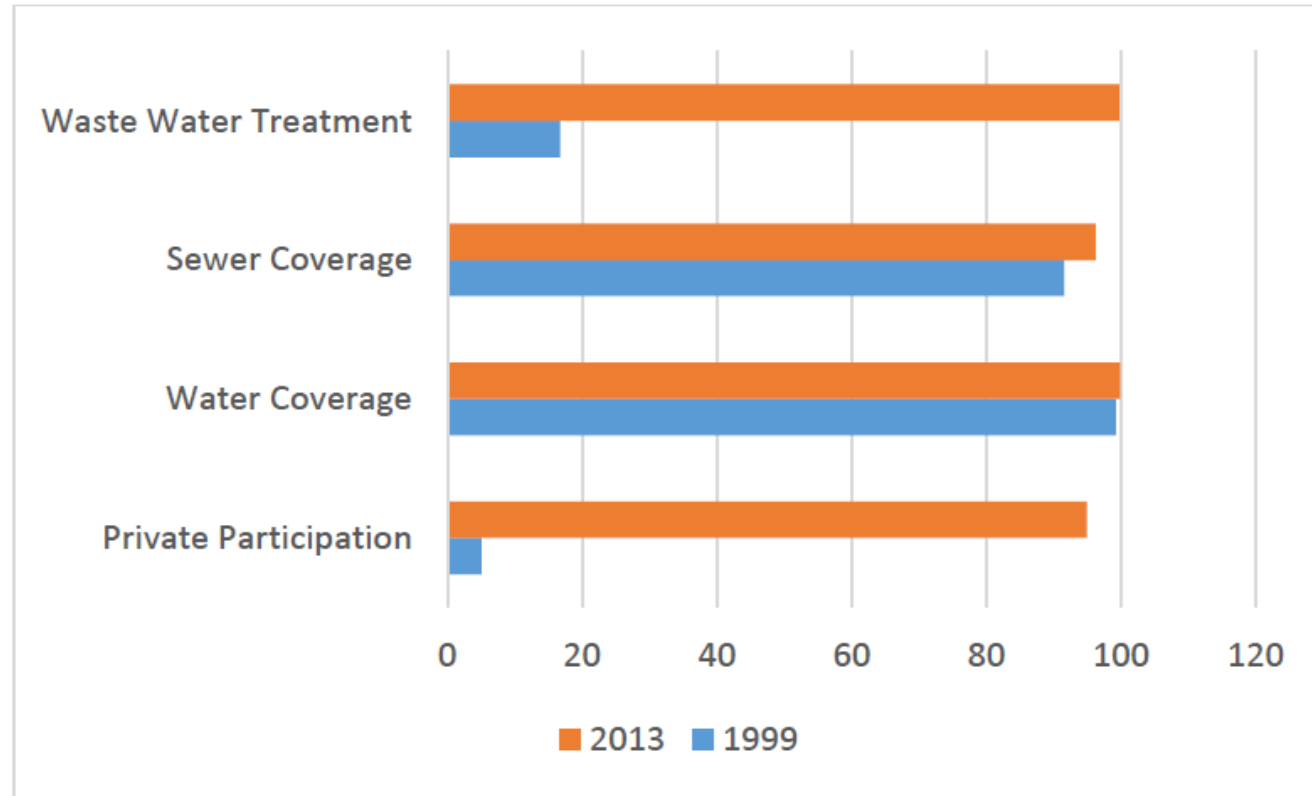
# Equity and Affordability

## Water Consumption and Sanitation Subsidy

- Advantages
  - Economic signals are not distorted
    - Families receive bill with total consumption and cost
  - More equitable than implicit subsidies in tariffs
  - Separates public agency that sets the tariff from the agency that identifies subsidy recipients
- Disadvantage
  - Implementation costs

# Chile's Urban Water and Sanitation sector

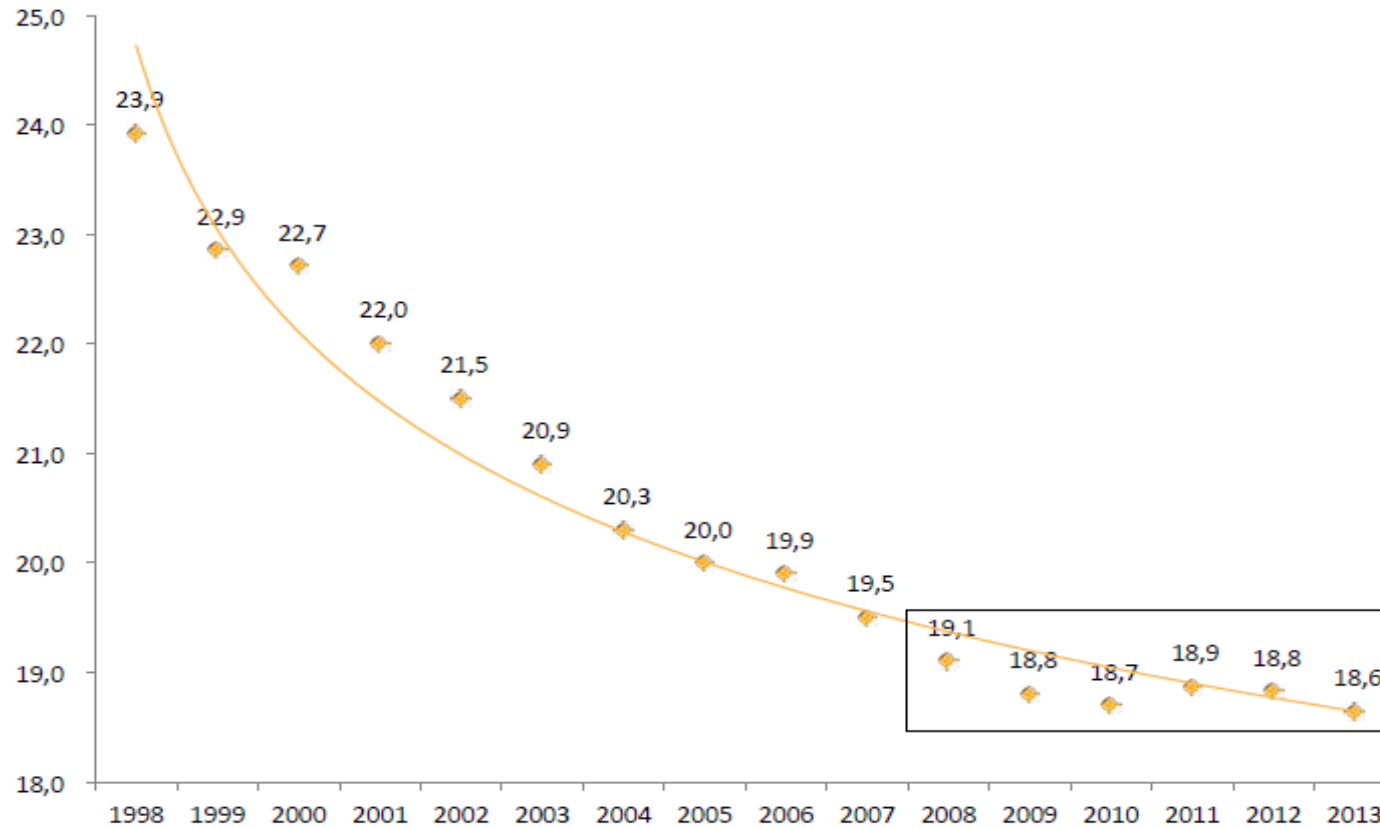
## Growth and Evolution



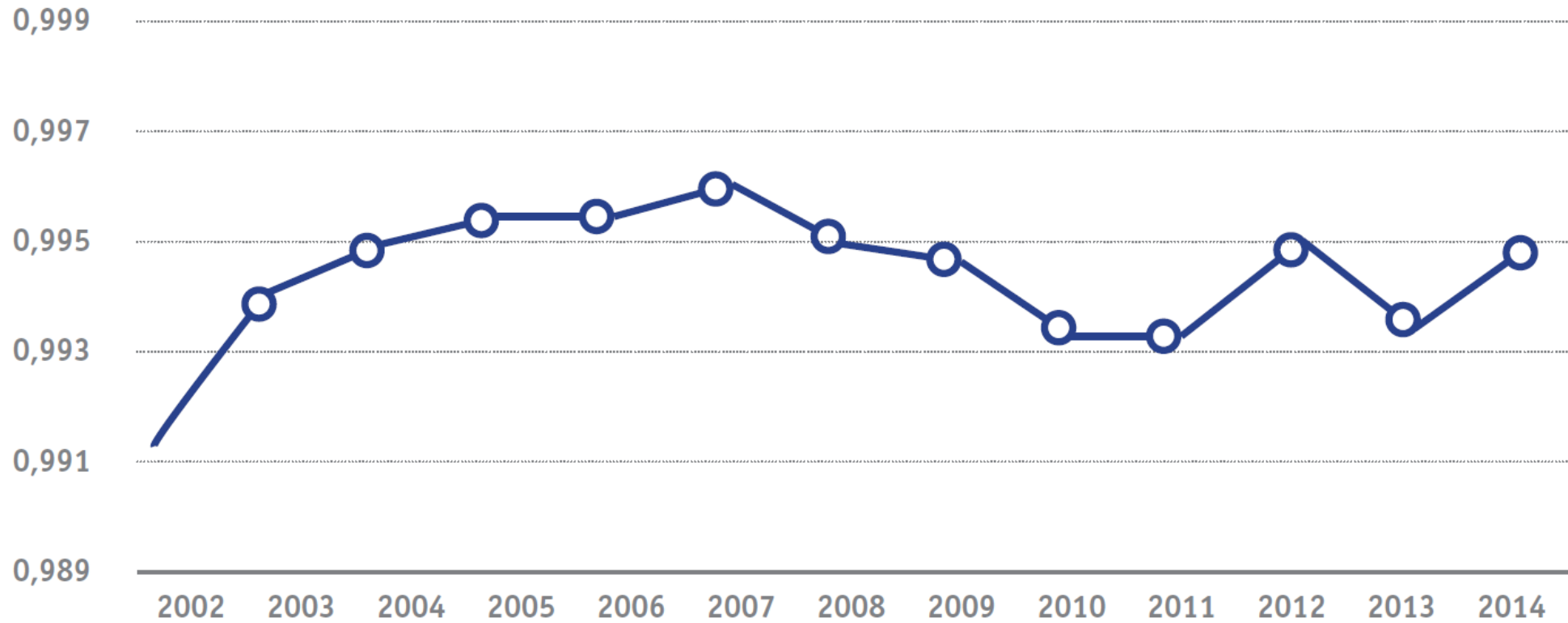
SISS (2013)



# Average monthly household water consumption (m<sup>3</sup>/household/month) (SISS, 2013)



# Water Supply Continuity (SISS, 2014)



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# Do tariffs reflect water scarcity?

Atacama



Water availability: 208 m<sup>3</sup>/person/year  
Population: 254,336 inhabitants (1,67%)  
Extension: 75,176 Km<sup>2</sup> (9,09%)

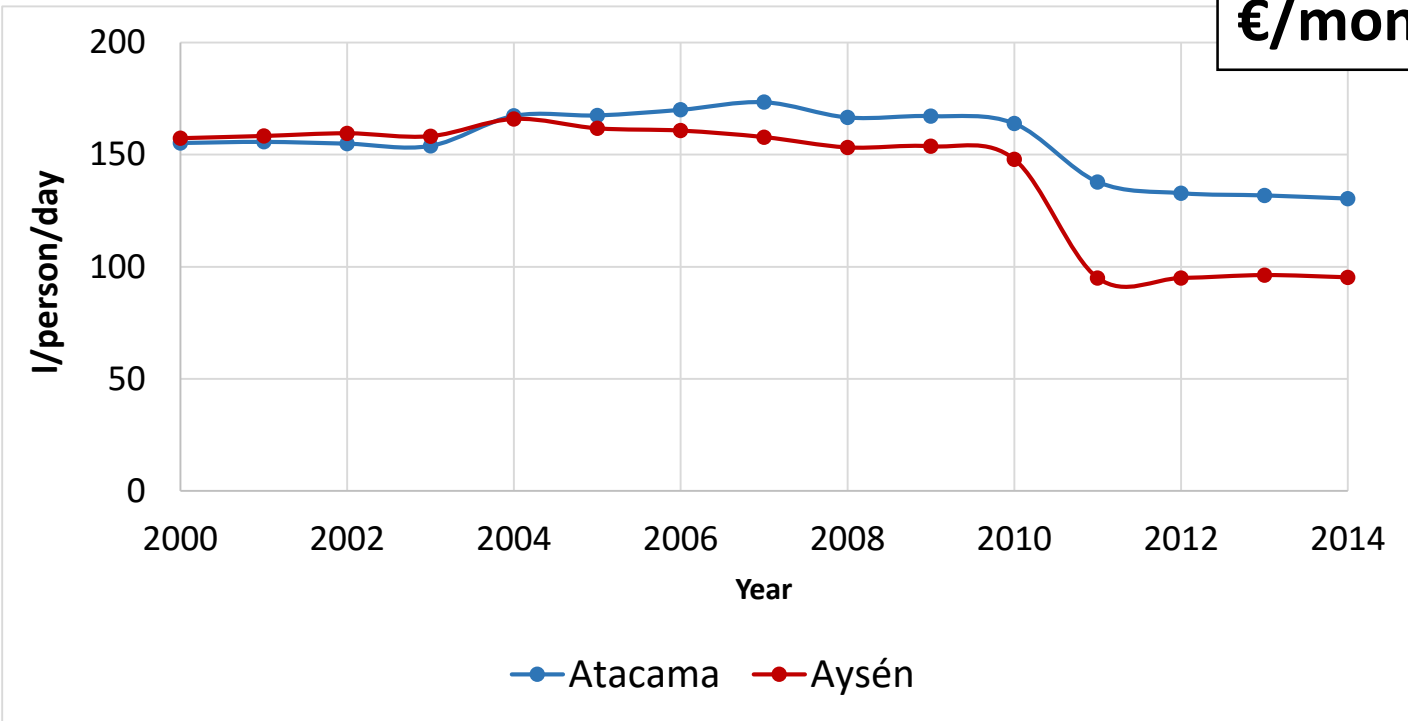
Aysén



Water availability: 2,993,585 m<sup>3</sup>/person/year  
Population: 91,492 inhabitants (0,65%)  
Extension: 108,494 Km<sup>2</sup> (14.3%)

# Do tariffs reflect water scarcity?

Evolution of urban water consumption



**Atacama: 35,936 Ch\$/ 20 m<sup>3</sup> /month (46.07 €/month)**  
**Aysén: 33,243 Ch\$/ Ch\$/ 20 m<sup>3</sup> /month (42.62 €/month)**

**Atacama: 130.4 l/person/day**  
**Aysén: 95.3 l/person/day**

# Closing Remarks

- Chilean WSS Regulation has provided
  - Right economic signals for an efficient allocation of resources.
- Led to
  - Improvement in quality of service
  - Increase in WSS provision coverage, despite rapidly increasing urban populations; and
  - Increase in water conservation by customers.

# Challenges

- Declining water sources due to climate change
- Higher frequency and intensity of droughts
- Identify and invest in new water sources
- Reduce non-revenue water (30% to 40%)
- Increase energy use efficiency
- Timely response to the requirements of increasingly demanding customers





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