

Water security and charging for the use of water in river basins: a case study of São Paulo, Brazil

Ina Thomé Picoli
Roberto Luiz do Carmo

*Center for Environmental Studies and Research – NEPAM
University of Campinas – UNICAMP
São Paulo, Brazil*

Overview

1) Introduction

- (Water management in Brazil, specially in SP state);

2) Methodology

3) Results

4) Discussion and Conclusion

Purpose

To discuss the relation between charging for water use and water security in river basins, and to analyze how the funds have been used.

Introduction (1/5)



AM: Few people- Much water;
SP: Many people – Little water

Brazil:

- 11% of the world's drinking water; enough water for its **208** million people (**≈2.8% of the world's population** (World Bank, 2016).
- **70%** of the water in the Brazilian territory is **available only to 7%** of the population, resulting, as a consequence, in economic scarcity (Brasil, 2008; Johnsson, 2014).

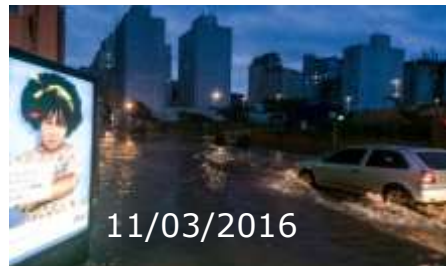
São Paulo:

- Has ≈20 million people;
- 32% of country's GDP;
- Concentrates an industrialized area;
- The most important economic center of Brazil;
- Has a high-density population.

Introduction (2/5)

- ✓ There are extreme events such as water scarcity and excess of water.
- ✓ These events result (probably) from anthropic actions (and climate change ?).

Scenarios of **long periods of droughts** coexist with **high rainfall**:



Why is this important?

Because this is a challenge to water management!

“Only in the last ten years, issues such as water pollution and contamination and its rational use have become priorities for public policies” (Costa & Monte-Mor, 2002).

Introduction (3/5)

The Brazilian Water Management was instituted by National Policy of Water Resources (Law 9433/1997) (20th year of the Law)

“The main objective was to **develop the sustainable management of water resources**, to ensure availability for future generations, with quality standards appropriate for their respective uses” (Canuto & Sampaio, 2011).

There are 4 management tools:

1. Granting the right to use water (water allocation);
- 2. Charging for water use;**
3. Framing of water bodies in classes of use;
4. National System Information on Water Resources (SNIRH).

“Charging for water use is a management tool to stimulate an economic relationship between users and water resources” (THAME, 2000).

Introduction (4/5)

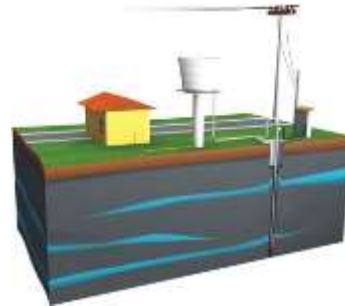
The charging applies to all user: industry, agriculture and domestic use

Users that **change water quality and quantity of a basin** are subject to the charging.

Users under the agreement for example:



capture water from surface
water bodies



extract groundwater



emit sewage

On the other hand, **citizens** pay a **fee** for water supply, which is used to cover the costs related to water catchment and treatment.

Introduction (5/5)

Who pays for water use in SP?

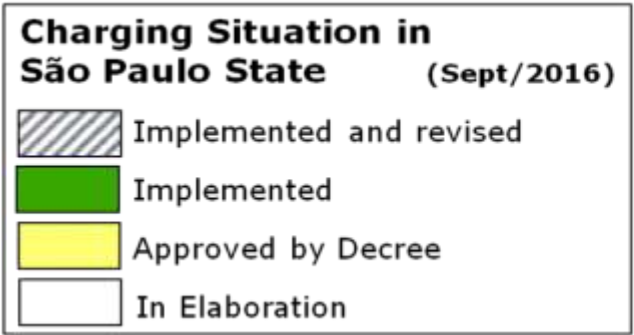
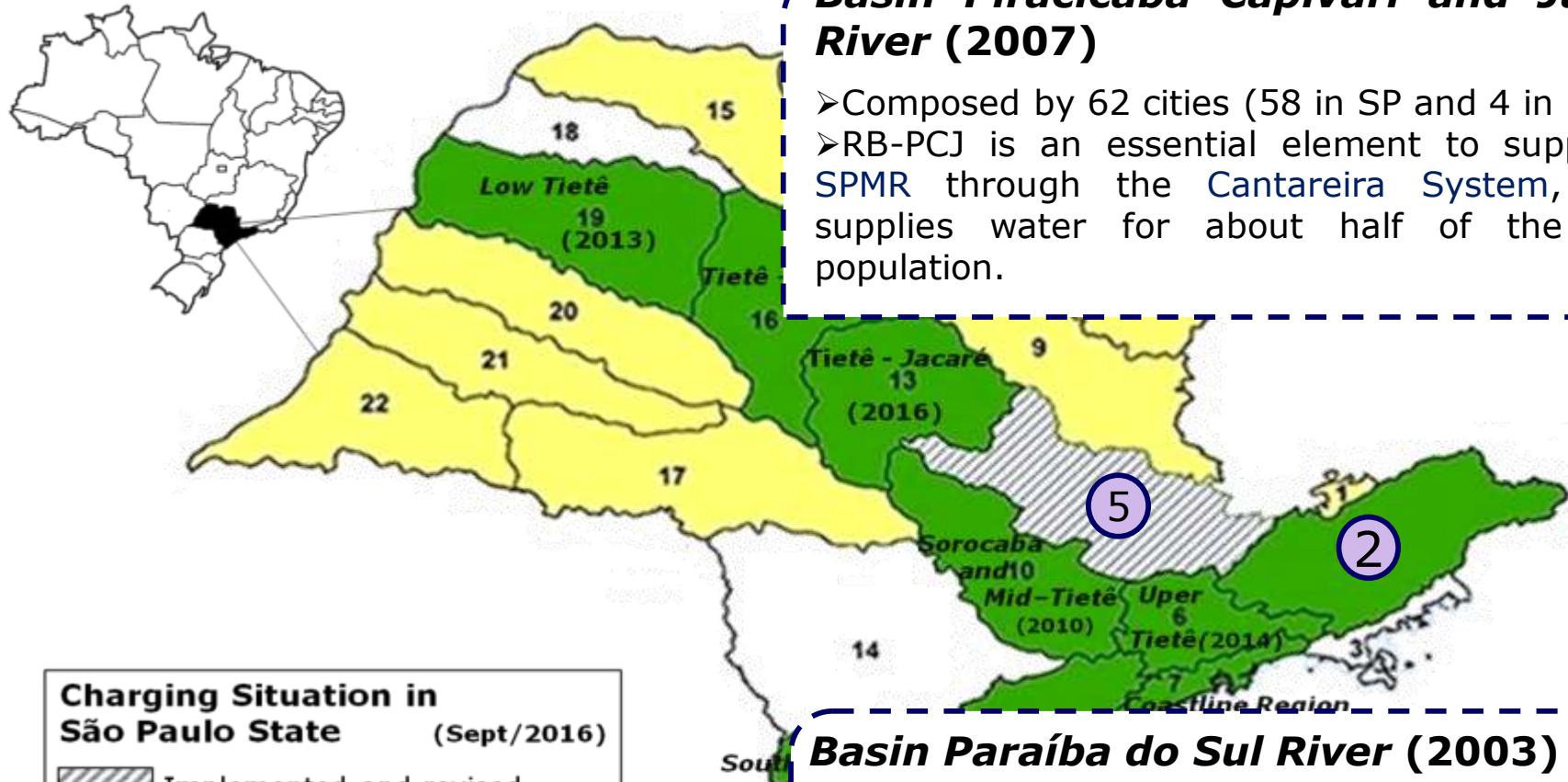
Charging situation in São Paulo state

Basin Piracicaba Capivari and Jundiá River (2007)

- Composed by 62 cities (58 in SP and 4 in MG).
- RB-PCJ is an essential element to supply the SPMR through the Cantareira System, which supplies water for about half of the SPMR population.

Basin Paraíba do Sul River (2003)

- Covers an area crosses 3 states (RJ, MG and SP).
- Urban population is about 4.9 million people.



Methodology

*First, a literature review about water security, seeking to outline the impacts on water availability in SP.

*Then, an analysis of the water management indicators, related to:

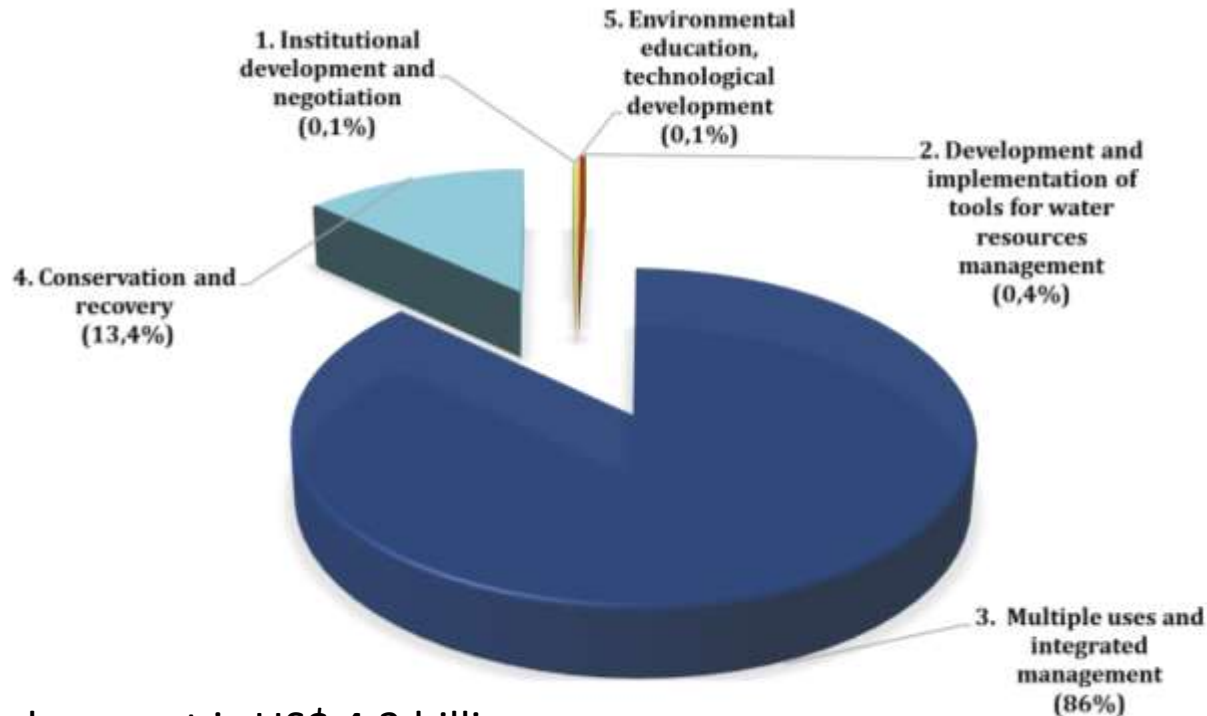
- ✓ **rational use of water** and
- ✓ **investments programs** focused on quantity and quality of water, conservation and protection, for example, Payment for Environmental Services (PES).

(3 categories). Basically, to demonstrate the allocation of resources of works and projects in:

- SP state (with an overview of the State Water Resources Plan);
- Basin PCJ rivers;
- Basin PS river.

Results: São Paulo state

Based on the State Water Resources Plan, the investment was divided into 5 areas:



- ✓ The total amount is US\$ 4,3 billion.
- ✓ The areas that have received most investments are:
 - **Area 3: Multiple uses and integrated management (86%)**
 - **Area 4: Conservation and recovery (13,4%).**

Basically the resources from the water use was allocated in action and programs related to **Basic Sanitation System, prevention** and **reduction of critical events**.

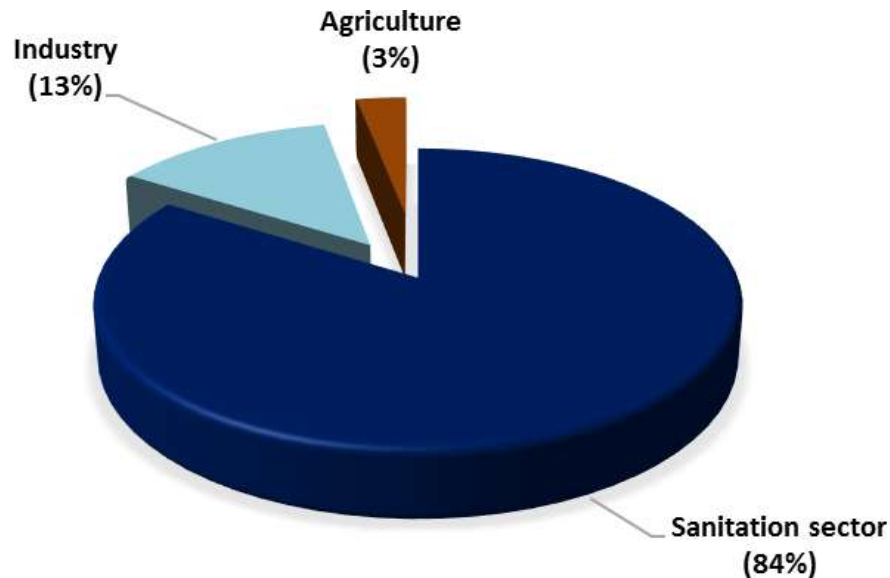
Results: Basin PCJ river(1/2)

The charging in RB-PCJ started in 2006.

Between 2006-2015 the total resources was about US\$ 39 million.

The first results show that from 2006 on the resources from this management tool have been used to attend emergency sanitation issues, which result from the urban expansion.

Who pays in Basin PCJ river?



Results: Basin PCJ river(2/2)

In the period between 2010-2020 it is estimated that the total investment in programs and actions will be of about 0,7 billion* dollars, used in:

Programs and actions in the Basin PCJ river	Total invested (R\$ million)	
Database, registers, studies and surveys	79	
Water resources management	19	
Restoration of the quality of water bodies	888 (32%)	} 70% (≈US\$ 496* million)
Conservation and protection of water bodies	383	
Promotion of rational use of water resources	1037 (38%)	
Multiple use of water resources	179	
Defense against external hydrological events	139	
Technical qualification, education environmental and social communication	30	
Total	2.755	

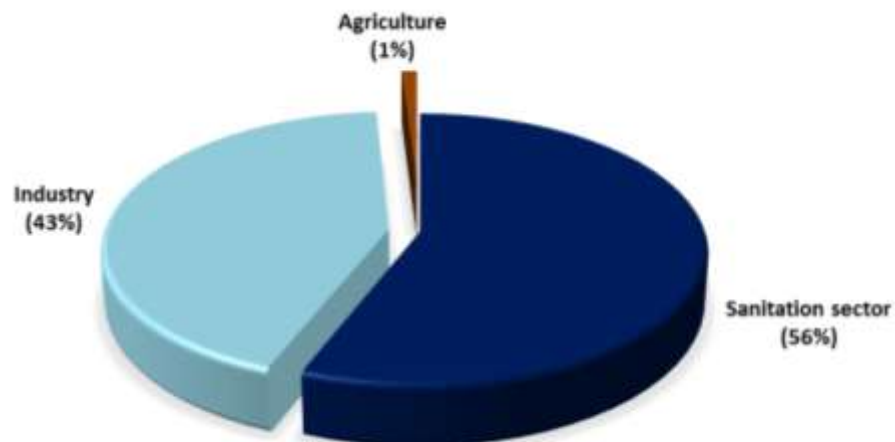
*Currency conversion – December, 2015 (R\$ 1 = US\$ 3,87)

- ✓ The amount charged is **not enough** to preserve and recover the surface water to maintain water security, **as well as** mitigate the effects of extreme events.
- ✓ **Although the basin establishes the priority investments, they are not entirely viable!**

Results: Basin Paraíba do Sul river

Charging between 2003-2011 :

- The charging started on 2003.
- It's estimated that the annual value of charge to be paid is about US\$ 5.4 million.



How have the funds been used? (2003-2011)

Component	Programs	Resource destined by program (thousand R\$)	
(1 st) Recovery of environmental quality	Reduction of pollution loads	82.620	(≈ US\$ 21,1 mi)*
	Urban drainage and flood control		
(2 nd) CEIVAP demand	Charging evaluation	38.553	(≈ US\$ 9,9 mi)*
	Basin plan		
	Emergency actions		
(3 rd) Protection and use of Water Resources		13.992	(≈ US\$ 3,61 mi)*
(4 th) Water resource management		8.040	(≈ US\$ 2 mi)*

*Currency conversion – December, 2015 (R\$ 1 ≈ US\$ 3,87).

Discussion and Conclusion (1/3)

First of all, the Water management in those Basins (PCJ and PS) requires actions to:

- increase basin resilience;
- minimize effects of extreme events;

Secondly, as we all know, water resources provide ecosystem services, so this needs to be considered in the Management Plan (Vieira, 2005).

Discussion and Conclusion (2/3)

The results show that:

- ✓ the vulnerability of water resources in SP state was related to the degradation of native forest areas;
- ✓ Apart from that, coexisting problems like:



Susceptibility to flooding



Groundwater
Drawdown risk



Improper disposal of solid waste

Discussion and Conclusion (3/3)

The funds from water charges need to be seen as **a possibility to minimize** the impacts of extreme events;

Finally, investments need to be expanded to **other areas** that have an important role in developing water management, as an example:

- environmental education;
- preservation of riparian forests and forests in general;
- preservation of ecosystem services associated with water resources.

References

Brasil. (2008) Ministério da Integração Nacional. A irrigação no Brasil: situação e diretrizes. Brasília.

Cassuto, D. N. and Sampaio, R.S. Water Law in the United States and Brazil - Climate Change and Two Approaches to Emerging Water Poverty, 35 Wm. & Mary Envtl. L. & Pol'y Rev. 371 (2011), Available from: <http://scholarship.law.wm.edu/wmelpr/vol35/iss2/2> [Accessed 19th November 2016]

Costa, H. S. M; Monte-Mor, R. L. M. Urbanization and Environment: trends and patterns in contemporary Brazil. In: HOGAN, D. J; BERQUÓ, E.; COSTA, H. S. M. (Ed.). Population and environment in Brazil: Rio + 10. Campinas, SP: CNPD/ABEP/NEPO, 2002.

Johnsson, R.M.F. Water Resources Management in Brazil: Challenges and New Perspectives. World Bank Water, april-june:2014.

Thame, A. C. de M. (org.) (2000). A Cobrança pelo uso da água. São Paulo: IQUAL, Instituto de Qualificação LTDA.

Vieira, P.F. (2005) “Gestão de Recursos Comuns para o Ecodesenvolvimento. In: Gestão Integrada e Participativa de Recursos Naturais. Conceitos, Métodos e Experiências. Vieira, P.F. (org) Florianópolis: Secco/APED.

World Bank Group. 2016. High and Dry: Climate Change, Water, and the Economy. World Bank, Washington, DC. World Bank. Available from: <http://hdl.handle.net/10986/23665> License: CC BY 3.0 IGO [Accessed 30th January 2017]



THANK YOU

Ina Thomé Picoli
ina.thome@yahoo.com.br

Center for Environmental Studies and Research
www.nepam.unicamp.br