

# **Valuation of Ecosystem Service of Blue Water Provisioning 2013 - 2017**

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# Agenda

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# Goal

- Valuation of Ecosystem Service of Blue Water Provisioning used by the Water collection, treatment and supply activity.
  - Blue Water:
    - Water available in surface and ground water (Hoekstra et al. 2011).
  - Spatial cutout:
    - National: Brazil.
  - Analysis period:
    - 2013 - 2017.

# Method

## Categories of economic values for water

### Use values

- **Direct use values:** the direct use of water resources for consumptive uses, such as input to agriculture, manufacturing and domestic use; and non-consumptive uses, such as generating hydroelectric power, recreation, navigation and cultural activities
- **Indirect use values:** the indirect environmental services provided by water, such as waste assimilation, habitat and biodiversity protection and hydrologic function
- **Option value:** the value of maintaining the option for use of water, direct or indirect, in the future

### Non-use values

- **Bequest value:** the value of nature left for the benefit of future generations
- **Existence value:** the intrinsic value of water and water ecosystems, including biodiversity; for example, the value people place simply on knowing that a wild river exists, even if they never visit it

## Valuation techniques for water

Valuation techniques	Comments
<b>1. Water as an intermediate input to production: agriculture and manufacturing</b>	
Residual value	Techniques furnish average or marginal value of water based on observed market behaviour.
Change in net income	
Production function approach	
Mathematical programming models	
Sales and rentals of water rights	
Hedonic pricing	
Demand functions from water utility sales	
<b>2. Water as a final consumer good</b>	
Sale and rental of water rights	All techniques except contingent valuation furnish average or marginal value of water based on observed market behaviour.
Demand functions from water utility sales	
Mathematical programming models	Contingent valuation measures the total economic value based on hypothetical purchases.
Alternative cost	
Contingent valuation	
<b>3. Environmental services of water: waste assimilation</b>	
Cost of actions to prevent damage	Both techniques provide information on average or marginal values.
Benefits from the damage averted	

Source: SEEA-Water, UN, 2012.

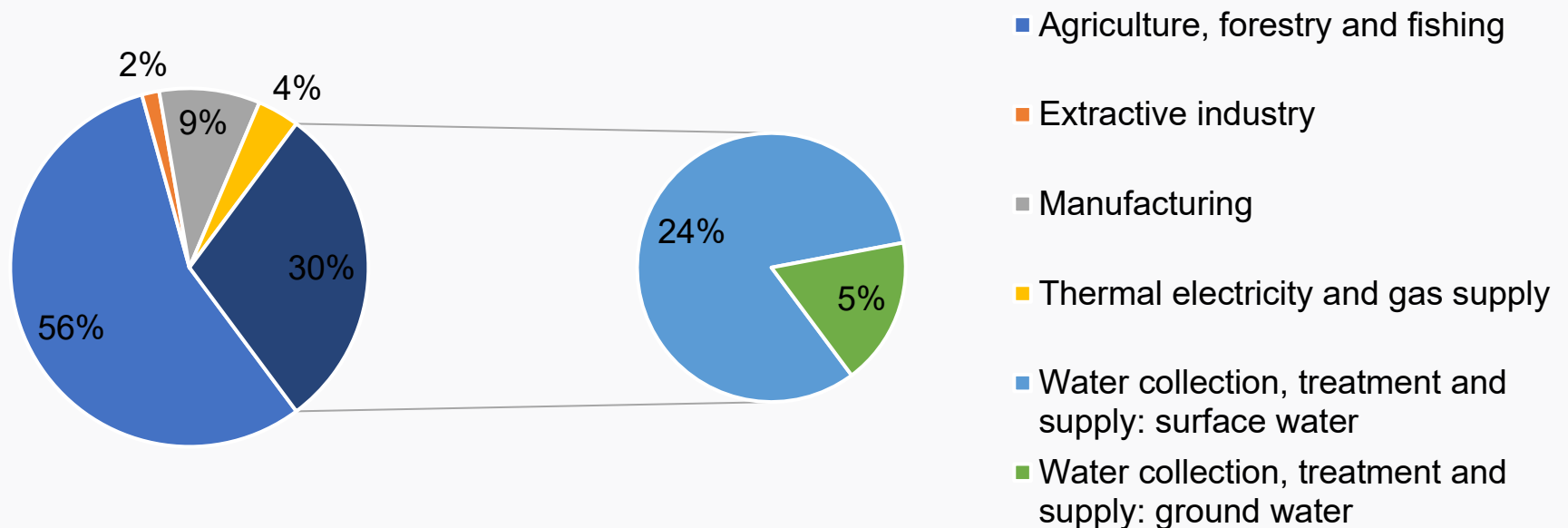
## Main data sources

- Information from databases of the:
  - System of National Accounts (SNA/IBGE).
  - National Water and Sanitation Agency (ANA).
  - Brazilian Environmental-Economic Accounting for Water.
  - National Sanitation Information System (SNIS).

## Main results: context

- According to the second publication of the Brazilian Environmental-Economic Accounting of Water, the withdrawal of Blue Water for consumptive use in 2017 was 66 thousand hm<sup>3</sup>.

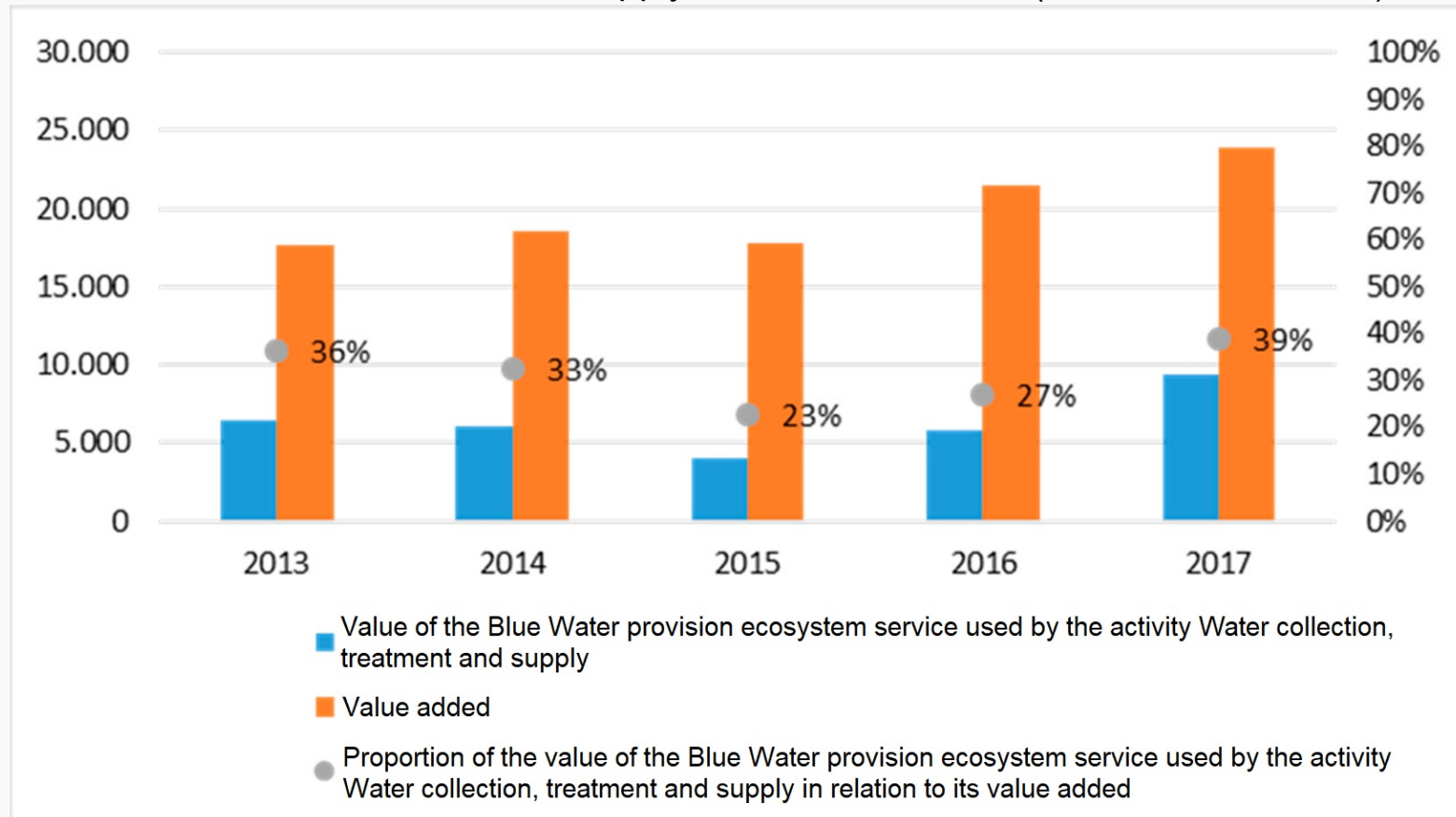
Proportion of economic activities in the direct abstraction of Blue Water for consumptive uses in Brazil: 2017



# Main results

- One of the most relevant results of the proposed study refers to the:

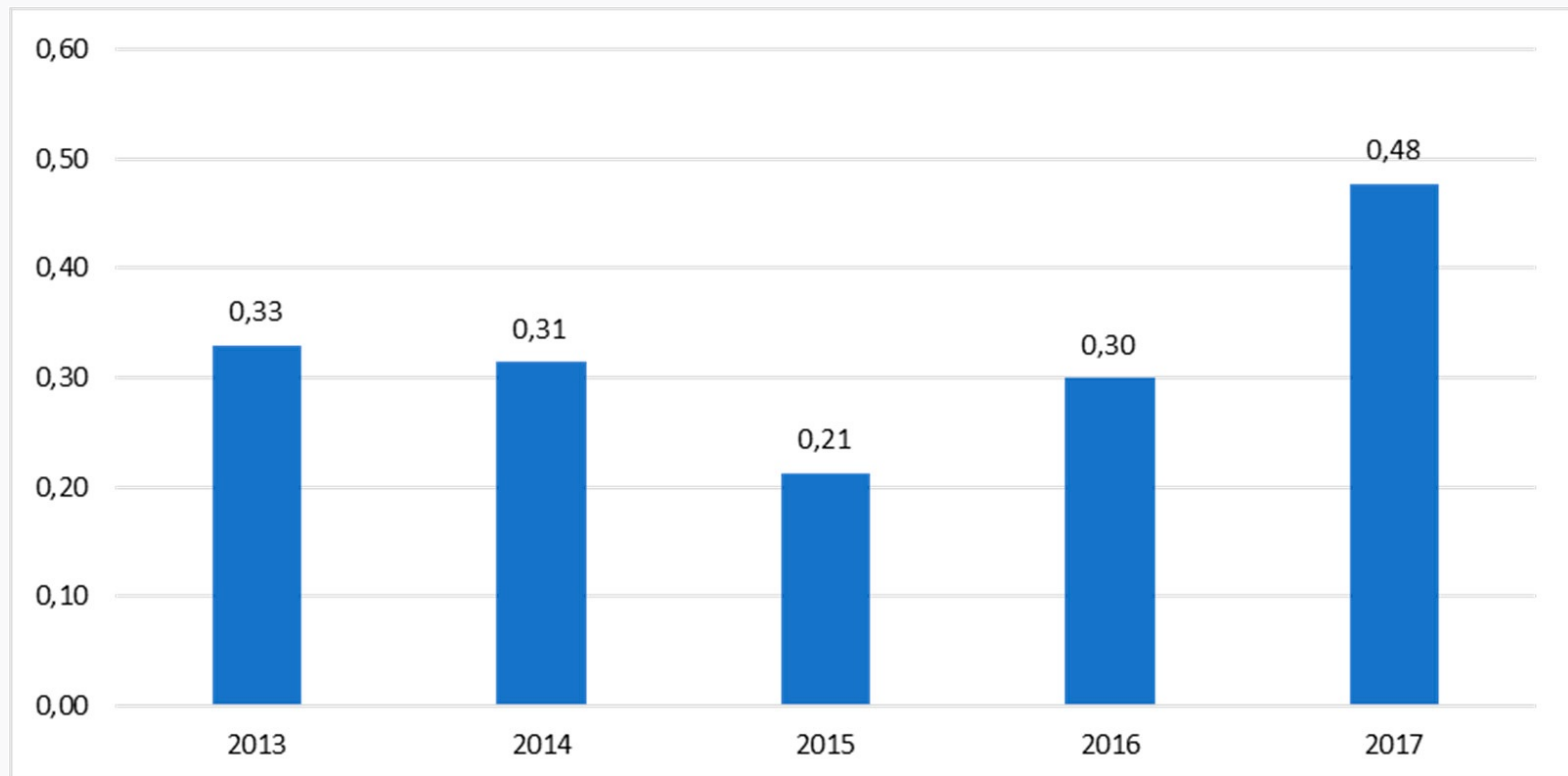
Proportion between the value of Blue Water provision ecosystem service used by the activity Water collection, treatment and supply and its value added (1.000.000R\$ and %)



Source: IBGE, 2021.

# Main results

Value of Blue Water provision ecosystem service used by activity Water collection, treatment and supply by direct abstraction of Blue Water (R\$/m<sup>3</sup>/year).



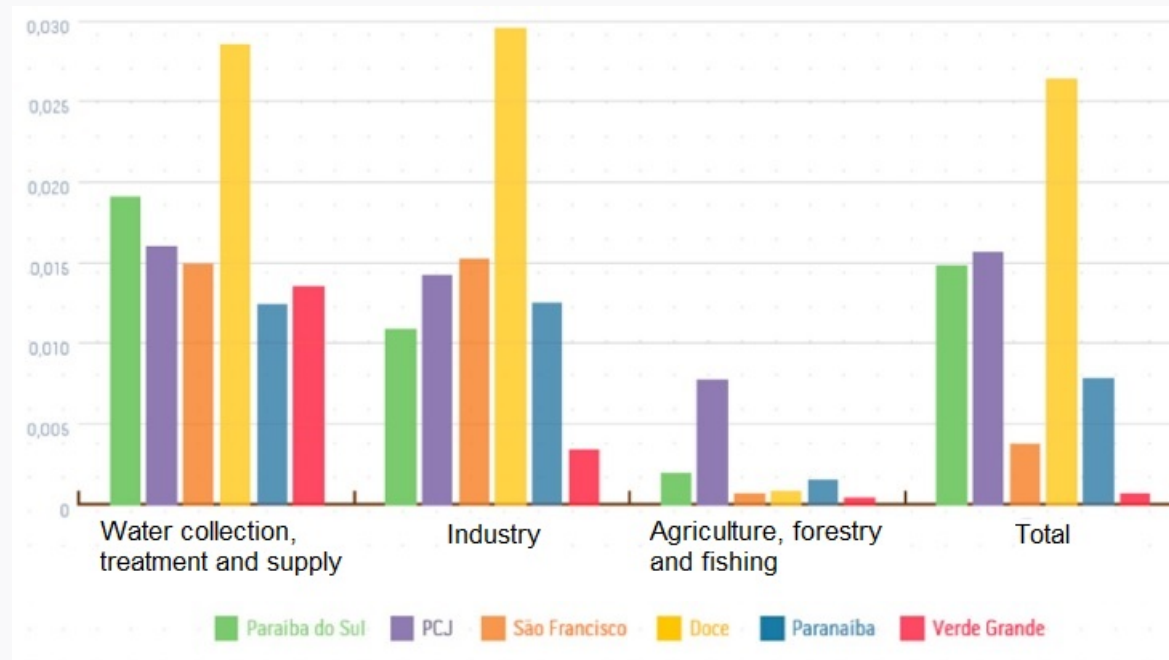
Source: IBGE, 2021.



# Discussion

- While Water collection, treatment and supply activity has the potential to remunerate the natural capital (water) in R\$0.33 m<sup>3</sup>/year, the value of the charge for the raw water use, by part of this activity in the Interstate Hydrographic Basins, varied between R\$0.013 and R\$0.028 (m<sup>3</sup>/year) in 2018.

Average charge for water use in Brazil (R\$/m<sup>3</sup>) - 2018



Source: ANA, 2019.

## Final considerations

- It is important to emphasize that this results must be analyzed in order to complement the physical information about the water use and availability.
- Additionally, it is important to mention that the results obtained must be considered experimental.
- Anyway, this study is relevant because it demonstrates that the valuation of water resources compatible with the System of National Accounts is possible and can contribute to the national and international literature, as well as, to the water resources management.

# References

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**Thank you!**

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