A nitrogen footprint perspective for Brazilian water sector.

Camille L. Nolasco[1], Felipe S. Pacheco[1], Janaina Guidolini[1], Beatriz Navarro[2], Jean H. B. Ometto[1], Alisson Leach[3] and James Galloway[4]

[1] Earth System Science Centre (CCST INPE), São Jose dos Campos, Brazil
[2] Universidade Estadual Paulista (UNESP), São Jose dos Campos, Brazil
[3] Sustainability Institute, University of New Hampshire, Virginia, USA
[4] Department of Environmental Sciences, University of Virginia, Charlottesville, USA

E-mail: camille.nolasco@inpe.br

Abstract

In the process of stablishing a national politics for the water management in Brazil, the linkages between population food, energy and water consumption are rarely mentioned. In this study, we present a perspective for the water sector into Brazilian N-footprint. Preliminary results show that most of Brazilian federal units have low wastewater N removal factor (< 0.2). With population increase and reduction of investments in sanitation in Brazil due to the economic crisis, N flow could rise and may aggravate the impacts on ecosystems and human health.

Keywords: ~~Nitrogen cycle~~wastewater, ~~environmental S~~sanitation, ~~Water ~~water quality, nitrogen footprint.~~.~~

1. Introduction

Water management in Brazil, established nationally by law only in 1997, is based on meeting multiple water use and watershed management for "ensure current and future generations the necessary availability of water, in quality standards appropriate to their uses". In the process of stablishing a national politics to the water sector, linkages between population food and energy consumption patterns are rarely mentioned.

Recent studies on environmental Sanitation in Brazil have shown that sewage collected is treated inadequately and inefficiently in major parts of the country. Population growth increases consumer-driven N flow (Hayashi, 2018) and exces in N may lead to eutrophication, causing negative impact on ecosystems and human health.

In this study, we show a preliminary perspective towards a nitrogen footprint for Brazil, specificaly related to wastewater N removal factor within the 'food component' of the N-footprint.

2. Methods and Results

The N-Calculator model is a tool developed by Leach et al. (2012) to estimate individual N-footprint, relating Nr losses and food and energy consumption by individuals.

2.1 Wastewater N removal factor

The N removal factor is calculated by the N influent–N efluent)/N influent. We used data from the Brazilian Sewage Atlas (ANA, 2017). Preliminary, results show the majority of Brazilian States have low wastewater N removal factor (<0.2, Fig.1).
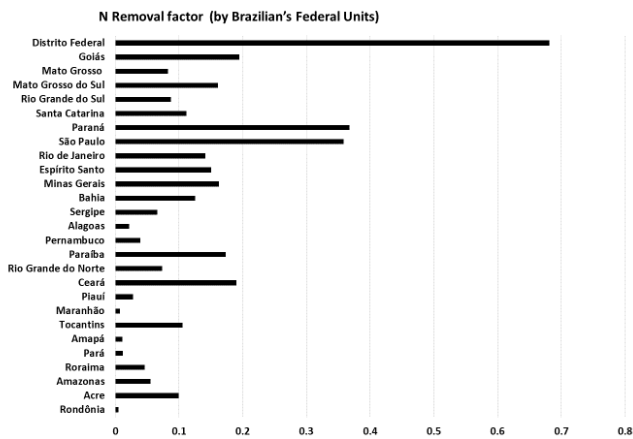
Fig. 1: N Removal factor calculated by Federal Units in Brazil. (data source: ANA, 2017)

3. Conclusion

In Brazil, sewage collection is still very low. In most parts of the country, even when collected, is treated inadequately and inefficiently, leading to higher N-footprint, mainly in the North region. At some point, both the N coming from wastewater and agriculture may reach N critical loading that may impair depuration capacity of Brazilian rivers. The tendency of increasing population and reduction in investments on sanitation due to the economic crisis may aggravate the scenario. Further calculations with N-calculator tool are ongoing and will help to create a more solid evidence in the implementation of the wastewater manegement system.

Acknowledgements

References

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