SHAPING BRAZILIAN WATER POLICY USING ENVIRONMENTALLY EXTENDED INPUT-OUTPUT MATRIX

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One of the biggest challenges of the 21st century refers to the sustainable management of water resources (UN-Water, 2021). Brazil concentrates 12% of all fresh water available in the world, presenting a comfortable situation in global terms. However, there is an uneven spatial distribution of this resource in the country. About 80% of its availability is concentrated in the Amazon Hydrographic Region, where there is a small population. This scenario, associated with the current water crises and the projection â€“ presented in the sixth report of the Intergovernmental Panel on Climate Change (IPCC) on August 9, 2021 â€“ of an increase in periods of drought alternating with floods, rising sea levels, desertification of some regions, among others, points to an even greater aggravation. In this context, the demand for information on the mapping of the direct and indirect use of water along the supply chain has been increase. In this context, the calculation of the Water Footprint and Virtual Water flows has occupied an important space. As pointed out in the System of Environmental-Economic Accounting - Applications and Extensions (SEEA-AE) (UN, 2017), the use of the Environmentally Extended Input-Output Matrix (EE-IOT) allows the calculation of Water Footprints and Virtual Water flows over the along the entire supply chain, making it possible to identify the main agents responsible for the use of water resources (FENG et al. 2011). Given these considerations, the objectives of this article are: (i) to identify the main users (direct and indirect) of water, whether located inside or outside the management region; (ii) map the water interdependence between the regions in order to make it possible to estimate the impact of the economy of a given region on the abstraction of water from another region and, consequently, on its Water Balance; and (iii) carry out impact analyzes simulating the impact of increased investments and change in water intensity on water abstraction and the Water Balance. The methodology used refers to the inter-regional EE-IOT, estimated for the year 2017, where Brazil was disaggregated into 3 regions: (i) Rio Grande River Basin; (ii) ParaÃ-ba do Sul River Basin (PBS); and (iii) Rest of Brazil (RBR)), considering 24 economic activities. Among the main results, we highlight that, in 2017, the Water Balance of the Rio Grande River Basin was in a worrying situation, with 12.6% of the 744.28 mÂ³/s of water availability committed to the demand for consumptive uses (93.9 mÂ³/s), and a relevant part of this consumptive use was destined to the production of goods and services exported to other regions and/or countries (75 mÂ³/s, or 10.1% of water availability). At the same time, the Water Balance of the ParaÃ-ba do Sul River Basin was in a comfortable situation, with 8.9% of the water availability committed to the withdrawal flow for consumptive use. Similarly, demand from outside the Basin itself was the main factor responsible for the criticality classification in the Water Balance (24.2 mÂ³/s, or 6.6% of water availability). It was verified that the 1% increase in investments in the Brazilian economy can generate a greater impact in terms of water abstraction, value added and employment in the ParaÃ-ba do Sul River Basin, when compared to the effects generated in the Rio Grande Basin and in the rest of Brazil. It was also verified the impacts on water abstraction in the Rio Grande River Basin if its 'Water supply, sewage collection and treatment and waste management' activity worked with the same water efficiency as the 'Water water, sewage collection and treatment and waste management' of the ParaÃ-ba do Sul River Basin. Among the main results, it was found that there could be a reduction of 370 hmÂ³ (or 0.561%) in the consumptive use of water in Brazil, representing a reduction in the consumptive use of water in the Rio Grande River Basin of 11.63%. In turn, this result would contribute to the improvement of its Water Balance, reaching 11%, against the 12.6% recorded. Therefore, approaching the level considered comfortable. Thus, based on the results obtained, the interregional EE-IOT approach

has the potential to generate relevant information that contributes to expanding the conceptual and methodological basis used in the management of water resources, bringing new possibilities for investigation and production of relevant information for water management in Brazil.