The Role of the Ecological Fiscal Transfers for Water Conservation Policies

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Abstract

This paper's purpose is to fill the lacuna found in the literature with regard to describing the role of EFTs for water conservation policies. The literature tells us that ecological fiscal transfers (EFTs) are analysed so to pursue biodiversity conservation policies and solid waste management (SWM). For biodiversity conservation policies, EFTs have two purposes: (1) to incentivize municipalities to create local protected areas (PA); and (2) to compensate municipalities for corresponding land-use restrictions. In the case of SWM, the main idea is that, even considering the fees paid by the households, it is still costly to maintain

waste services in the municipal territories. In this context, EFTs are appealing policy instrument to help local governments create landfills or composting plants. However, in Brazil EFTs are functioning as a policy instrument which also includes a wide range of policy domains, such as water conservation, indigenous land, fire-control, and so on. Six states adopted EFTs specifically for water conservation policies: Goiás, Paraná, Pernambuco, Piauí, Rio de Janeiro, and Tocantins. Descriptive analyses, focusing on legislative differences are conducted for each of these states.

Keywords (separated by '-')	Ecological fiscal transfers - Water conservation policies - Brazil

The Role of the Ecological Fiscal Transfers for Water Conservation Policies

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Abstract This paper's purpose is to fill the lacuna found in the literature with regard to describing the role of EFTs for water conservation policies. The literature tells us that ecological fiscal transfers (EFTs) are analysed so to pursue biodiversity conservation policies and solid waste management (SWM). For biodiversity conservation policies, EFTs have two purposes: (1) to incentivize municipalities to create local protected areas (PA); and (2) to compensate municipalities for corresponding land-use restrictions. In the case of SWM, the main idea is that, even considering the fees paid by the households, it is still costly to maintain waste services in the municipal territories. In this context, EFTs are appealing policy instrument to help local governments create landfills or composting plants. However, in Brazil EFTs are functioning as a policy instrument which also includes a wide range of policy domains, such as water conservation, indigenous land, fire-control, and so on. Six states adopted EFTs specifically for water conservation policies: Goiás, Paraná, Pernambuco, Piauí, Rio de Janeiro, and Tocantins. Descriptive analyses, focusing on legislative differences are conducted for each of these states.

Keywords Ecological fiscal transfers · Water conservation policies · Brazil

1 Introduction

Ecological fiscal transfers (EFTs) redistributes revenues from upper to lower levels of government using ecological indicators (Ring and Barton 2015). Brazil was the first country to adopt ecological indicators in fiscal transfers (Ring 2008;

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Paulo and Camões 2018), followed by Portugal (Droste et al. 2017) and France (Schröter-Schlaack et al. 2014). Poland has already introduced the discussion on EFT implementation introduced in the policy arena (Schröter-Schlaack et al. 2014), and other countries have theoretically simulated such a scheme: Germany (Ring 2002), Switzerland (Köllner et al. 2002), and Indonesia (Mumbunan et al. 2012).

Brazil follows a mix of policy instruments to achieve targets in environmental policies (May et al. 2012). EFTs are a policy tool, among others, that contribute to achieve environmental and social goals at local level. Its operation in Brazil is based in a tax collected from the state government which is transferred to municipalities. There are several policies targets introduced in EFTs schemes across Brazilian states, but the literature theoretically and empirically explores two: protected areas (PA) and solid waste management (SWM).

The potential of EFTs goes beyond those related to PA and SWM. Indigenous land, fire control, environmental education, and water conservation are examples of policies in which EFTs tools may contribute to sustainable local development. In the case of water conservation policies, there is a literature gap on the role of EFTs mechanisms regarding the incentive and compensation to local governments in such fiscal transfers. It is an exciting research agenda because it can inspire other developing countries to adopt similar policies so to achieve goals related to water policies. It is strongly related to the 2030 Agenda for Sustainable Development, particularly concerning the importance in ensuring availability and sustainable management of water and sanitation for all.

The paper is structured in three more sections. The second section addresses the EFTs policy tool in Brazil, detailing the mechanism of fiscal transfers, the criteria that is usually adopted, and the potential of EFTs across states. The third section addresses the role of the ecological fiscal transfers for water conservation policies, mainly concerning the incentive and compensation. The last section presents the conclusion, by showing suggestions for future research and policy recommendations.

2 Ecological Fiscal Transfers in Brazil

Ecological fiscal transfers in Brazil are a mechanism for redistributing a tax collected from the state government, the ICMS (*Imposto sobre Operações Relativas à Circulação de Mercadorias e sobre Prestações de Serviços de Transporte Interestadual e Intermunicipal e de Comunicação*), to local governments. They are known using different names: *ICMS Ecológico, ICMS Verde*, and *ICMS Socioambiental*. To be precise, three-quarters of the revenue collected from ICMS remains with the state government and only one is redistributed to local governments. Three-quarters of this one-quarter is transferred according to fiscal value-added criterion, while remaining quarter may be transferred according to the state-policy objectives. The states are free to decide upon the criteria used in these transfers. EFTs may compose the amount destined to state-policy objectives (see Fig. 1).

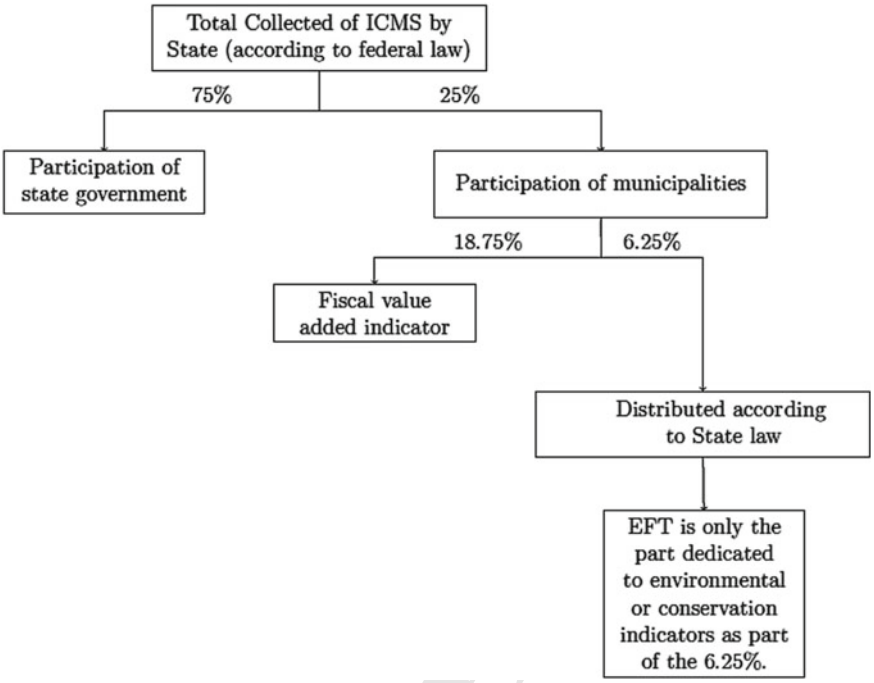

Fig. 1 Ecological fiscal transfers in Brazil. *Source* de Paulo and Camões (2017)

EFTs in Brazil are not earmarked, that is, the local governments can use the money they receive as they deem fit. The first state to adopt EFTs in Brazil was Paraná in the early 1990s. To date, there are sixteen out of twenty-six states that have adopted ecological indicators to redistribute the ICMS. The criteria vary according to each state, including those related to water conservation policies. However, there are two main areas which are usually adopted across Brazilian states: protected areas and solid waste management (see Table 1).

EFTs schemes adopted in Brazil have one criterion in common: protected areas. The comprehensive literature on EFTs highlights their objective for the protected area as a mechanism to compensate local governments for land-use restrictions and to serve as an incentive mechanism for local governments to create a more protected area (Droste et al. 2017; Sauquet et al. 2014). Sauquet et al. (2014) summarize EFTs objectives for protected areas in two ways: first, for "*[…] rewarding municipalities for hosting state and federal PAs*"; second, for "*encouraging municipalities to create new PAs*." The incentive component of EFTs originates from the creation of new protected area by local governments, while the compensation component comes from the protected areas imposed by federal government and state government that lead to a loss in the economic exploitation of the land by the municipal government. Also, the municipality is compensated in creating a new protected area due to the benefits of the land-restrictions which go beyond its borders. Usually, there are quantitative

Table 1 EFT criteria adopted across Brazilian states

States	Protected areas	Solid waste management
Paraná	x	
São Paulo	x	
Mato Grosso do Sul	x	x
Minas Gerais	x	x
Amapá	x	
Rondônia	x	
Rio Grande do Sul	x	
Pernambuco	x	x
Mato Grosso	x	x
Tocantins	x	x
Acre	x	
Ceará	x	x
Rio de Janeiro	x	x
Piauí	x	x
Goiás	x	x
Paraíba	x	x
Pará	x	

Source Paulo (2017)

and qualitative measurements to evaluate a protected area by the state government. The state government may use the area of the protected area, its category (meaning the degree of land-use restrictions of PA), as well as its quality of management (Paulo and Camões 2018).

In the case of solid waste management, nine out of twenty-six states having adopted EFTs, have waste-related indicators in their schemes. These indicators vary across states, but the landfill and composting plants appear more frequently (see Table 2).

As a developing country, most of the Brazilian states face problems with solid waste management, mainly where the collection and disposal are concerned. Although the federal government implemented a command and control instrument which imposes the deactivation of dumps at the local level—the National Policy on Solid Waste-, most municipalities still persist in maintaining inadequate waste disposal in their territory (Castagnari 2005). Changing such an institutional arrangement at the local level is an enduring task for politicians, and deactivating dumps at the local level and implement landfills and composting plants, have proved challenging. Firstly, mayors face financial stress and do not have enough money to cover all expenses for their electorate, despite a fee paid by each household. Also, implementing a landfill in their territories create conflicts among residents, a movement so called as NIMBY (Not in My Back Yard). Another difficulty is that officials have

Table 2 Solid waste criteria in EFTs schemes

States	Waste-related indicators
Goiás	Collection, transportation and final destination for solid waste; landfill; incineration of waste; recycling; and composting plant. All of these criteria include also treatment for hospital and civil construction waste
Mato Grosso do Sul	Selective collection; municipal plan for solid waste management; treatment and disposal of solid waste
Pernambuco	Landfill; composting plants
Piauí	Collection and transportation of solid waste; public cleaning services; special waste; hazardous waste; and social and economic inclusion of collectors of recyclable
Ceará	Collection and transportation of solid waste; Landfill
Rio de Janeiro	Landfill
Tocantins	Collection, transportation, and final destination for solid waste
Minas Gerais	Landfill; composting plants; and recycling
Mato Grosso	Collection, transportation and final destination for solid waste

Source Compiled by authors from The Nature Conservancy

to choose from between policies that align with the expectation of their electorate in order to increase political benefits. Then there is the problematic situation in which most of the local government disposes their waste far away from areas with a higher populational density or, at times, in other municipalities. Collective action among mayors may minimize costs to implement landfill and composting plants due to economies of scale. Also, EFTs are a remedy to minimize the costs for such actions and they function as a financial incentive for politicians if the money they receive exceeds the costs in implementing and operating a landfill, a composting plant, or another waste management system.

Empirical works on EFTs present the potential of the policy instrument across Brazilian states. Concerning protected areas, Droste et al. (2017) find in all Brazilian states that "*there are clear indications for local responses to the implementation of EFT: after an ICMS-E introduction additional municipal PA are designated*". The conclusion of Grieg-Gran (2001) in Minas Gerais was that "*the ICMS ecológico has the potential to create incentives for conservation but the effect appears to be highly variable*". Sauquet et al. (2014) studied the interaction effect among local governments in terms of EFT´s incentive to create new protected areas. They found that the creation of local PA "*reveals strategic substitutability in municipalities´ conservation decisions*"; that is, "*the creation of [PA] by a municipality decreases the incentive of neighboring municipalities to create [PA].*"

Empirical works on EFTs concerning solid waste management are relatively scarce. In the state of Pernambuco, Silva Jr et al. (2012) conclude that the "*ICMS Socioambiental*" did not contribute to the improvement of the solid waste management across local governments. de Paulo (2013) notes a similar pattern in Per- AQ3

nambuco. The author concludes that only twelve out of one hundred eighty-four municipalities have tried to increase landfills.

3 Ecological Fiscal Transfers for Water Conservation Policies

As presented in the last section, EFTs are traditionally applied to biodiversity conservation policies and solid waste management. However, the state government can use EFTs for other policies, such as water conservation programmes. Six out of twenty-six states EFTs having adopted such a programme, implemented criteria related to water conservation policies in Brazil (see Table 3).

Water policies vary little across states. They share some common strategies related to water policies: water conservation, quality, protection of water sources and river, and protection of public water supply. In the state of Goiás, the EFTs scheme for water policies comprises five percent of the total amount dedicated to such policy instrument (see again Fig. 1). The criteria in the scheme are based on programmes related to water conservation and protection of public water supply at the local level, that is, the policy instrument works as an incentive for municipalities to implement

Table 3 Water conservation policies criteria in EFTs schemes

States	Water-related Indicators	Legislation
Goiás	Water conservation, protection of public water supply (water quality)	Supplementary law n.º 90, 22 December 2011
Paraná	Protection of water sources	Constitution of the state of Paraná, 5 December 1989, Law n.º 9.491, 21 December 1990, Supplementary law n.º 59, 1 October 1991, Supplementary law n.º 67, 8 January 1993, Decree n.º 2.791, 27 December 1996, Decree n.º 3.446, 14 August 1997, Decree n.º 1.529, 2 October 2007
Pernambuco	River protection and water sources	Law n.º 15929/2016
Piauí	Protection of water sources, water quality	Law n.º 5.813, 3 December 2008, Decree n.º 14.348, 13 December 2010
Rio de Janeiro	Water quality	Law n.º 5.100 4 October 2007, Decree n.º 41.844, 4 May 2009
Tocantins	Water conservation	Law n.º 1.323, 4 de April 2002, Decree n.º 1.666, 26 December 2002, Regulation COEMA n.º 2, 4 November 2003

Source Compiled by the authors from the state legislations

these policies in their territories. In the state of Paraná, water policies comprise 2.5% of the EFTs to be redistributed to municipalities. This policy instrument encourages local governments to preserve basins of superficial springs that serve the urban centers of neighboring cities, as well as the underground springs that also help the urban centers of neighboring municipalities. In Piauí, the EFTs scheme is based on stamps, which vary from "A" to "B", "A" meaning the best standard of environmental protection at the local level, and "B" the minimum standard of environmental protection of municipalities to receive money from EFTs. Such schema dedicate five percent, among other criteria, for water conservation policies at the local level. It comprises protection of water sources, such as the protection of areas where water sources are recharged, replantation or conservation of riparian forest and headwaters, adequate disposal of sanitary sewage, and monitoring the quality of the public water distributed and served. In Rio de Janeiro, the EFTs scheme comprises 30% of the total dedicated to EFTs and has two main criteria: the watershed drainage area and water supply springs. In Tocantins, the EFTs scheme for water policies comprises only 3.5% (among other criteria: basic sanitation, and solid waste management) includes the quality of the public water distributed and served. In Pernambuco, EFTs for water conservation is not regulated by the state government so far. However, the inclusion of conservation of water source and rivers is predicted for near future.

The role of ecological fiscal transfers for water conservation policies in these schemes is to secure the availability and sustainable management of water and sanitation at the local level by providing financial incentive and compensation to local governments. Incentive because some municipalities in developing countries face financial stress and lack of technology to provide such type of public good. Mayors face dilemmas when making policy choices for their electorate. Compensation because municipal governments will be more willing in contribute to providing a collective good (water conservation) in which its benefits extend beyond their borders. They are compensated for the benefits that other municipalities may enjoy, such as the case of EFT in Paraná that compensate local governments that preserve basins of superficial springs which, in turn, serve the urban centers of neighboring cities. This role of EFTs is strongly supports goal 6 of the 2030 Agenda for Sustainable Development.

4 Conclusion

EFTs in Brazil redistribute the ICMS from the state government to local governments using ecological indicators. This mechanism can be quite different from other tax systems, such as in more centrally governments. It can change the incentive and compensation dimensions of EFTs to be implemented. However, both cases may apply such policy tool to achieve targets in water policies.

As a policy recommendation, we suggest participation of the political actors involved in the policy process. EFTs are a redistributive policy tools which affect

the budget of local governments. This effect may be strong for developing countries; therefore, this strategy can minimize conflicts and resistances.

For future research, we recommend testing the effects of EFTs for water conservation policies empirically, mainly to test whether with the introduction of EFTs the water policies increased at the local level (concerning quality and quantity).

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