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Economic instruments for water conservation: Charging for water use and the Pigouvian tax for mitigating water pollution

Instrumentos económicos para la conservación del agua: La tarificación del uso del agua y el impuesto pigouviano en la mitigación de la contaminación del agua

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Abstract: This paper presents an analysis of the economic instruments applied to water conservation, with a focus on charging for water use and the Pigouvian tax, and also addresses the synergistic integration of these instruments with other water management policies, involving a holistic approach to water conservation. In addition, the challenges in implementing these mechanisms are discussed, including political resistance and issues of social constraints. Methodologically, an interdisciplinary approach was adopted, combined with quantitative and qualitative analysis, followed by evaluation and representative case studies from different geographical and economic contexts. It is clear that the understanding and application of economic instruments in water conservation provides a robust theoretical framework and empirical evidence to support the effectiveness of charging for water use and the Pigouvian tax, which is crucial for promoting sustainable water resource management and mitigating water pollution on a global scale. In Brazil, charging for water use plays a crucial role in promoting the sustainable management of water resources, in line with principles of equity, efficiency and socio-environmental responsibility. However, its effectiveness depends on integration with other management strategies and the active involvement of all sectors of society.
Keywords: Charging for water use; Pigouvian tax; Water resource management; Water sustainability.

Resumen: Este documento presenta un análisis de los instrumentos económicos aplicados a la conservación del agua, centrándose en la tarificación del uso del agua y el impuesto pigouviano, y aborda también la integración sinérgica de estos instrumentos con otras políticas de gestión del agua, lo que implica un enfoque holístico de la conservación del agua. Además, se analizan los retos que plantea la aplicación de estos mecanismos, entre ellos la resistencia política y las cuestiones relacionadas con las limitaciones sociales. Metodológicamente, se ha adoptado un enfoque interdisciplinar, combinado con análisis cuantitativos y cualitativos, seguido del análisis de estudios de casos representativos de diferentes contextos geográficos y económicos. Está claro que la comprensión y aplicación de instrumentos económicos en la conservación del agua proporciona un marco teórico sólido y pruebas empíricas que respaldan la eficacia de la tarificación del uso del agua y del impuesto pigouviano, que es crucial para promover la gestión sostenible de los recursos hídricos y mitigar la contaminación del agua a escala mundial. En Brasil, la tarificación del uso del agua desempeña un papel crucial en la promoción de la gestión sostenible de los recursos hídricos, en consonancia con los principios de equidad, eficiencia y responsabilidad socioambiental. Sin embargo, su eficacia depende de la integración con otras estrategias de gestión y de la participación activa de todos los sectores de la sociedad.
Palabras clave: *Tarificación del uso del agua; Impuesto pigouviano; Gestión de los recursos hídricos; Sostenibilidad del agua.*

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INTRODUCTION

Water conservation is a relevant issue in today's context, as water is an essential resource for life, both for society and the environment. Water plays a fundamental role in numerous natural processes and systems, from maintaining ecosystems to supporting agriculture, industry and human supply. These challenges highlight the urgent need for innovative and effective water management strategies. The critical importance of water conservation goes beyond simply meeting the basic needs of human life. Water is a vital element for maintaining biodiversity and aquatic ecosystems. In addition, water is an important economic resource, driving sectors such as agriculture, energy production and industry. Its mismanagement or pollution results in significant costs for the economy, reflected in reduced agricultural productivity, infrastructure management and public health flexibility.

And the magnitude of the challenges faced in water conservation requires innovative and adaptive approaches to the management of these insufficient instruments, which often fail to internalize the complexity and dynamics of contemporary water systems. In this sense, economic instruments have emerged as a promising alternative, incorporating market mechanisms and financial incentives to promote the conservation and sustainable use of water.

Charging for water use and the Pigouvian tax represent concrete examples of how economics can be an ally in the quest for water conservation, providing incentives for both users and polluters, offering effective means of promoting responsible water use, internalizing environmental costs and encouraging sustainable practices. The relevance of using economic instruments in water conservation is undeniable given the contemporary challenges facing the world (Demajorovic, Caruso and Jacobi. 2015; Vieira and Fontgalland, 2023).

The growing pressures on water resources stem not only from population growth, but also from the intensification of industrial and agricultural activities, as well as climate change which alters the patterns of water availability and distribution, making it clear that there is a need to adopt innovative and effective approaches that can balance the growing demand for water with the pressing need to preserve aquatic ecosystems and guarantee equitable access to this vital resource (Tundisi, 2006; Tundisi 2008).

Given the challenges facing water conservation today, the use of innovative approaches to water management has become imperative, as traditional management strategies often prove insufficient to deal with the dynamics and magnitude of the problems faced. From this perspective, economic instruments present themselves as important tools for tackling the complexity and urgency of this issue, since by internalizing costs and sustainable practical incentives, these instruments not only promote efficiency in the use of water, but also protect the long-term protection of aquatic ecosystems, guaranteeing a sustainable future for generations to come. Therefore, this article aims to analyze the impact of charging

for water use and the Pigouvian tax on mitigating water pollution, thus contributing to the advancement of water conservation strategies in a constantly evolving global context.

THEORETICAL BACKGROUND

The effective management of water resources represents one of the greatest challenges of this millennium, amid a growing demand for drinking water and worsening environmental pressure, especially in the context of water pollution (Somlyody & Varis, 2006; Rogers Llamas, and Martínez-Cortina, 2006). The preservation of aquatic ecosystems and the mitigation of aquatic pollution have become crucial priorities for guaranteeing water and environmental security.

The preservation of water resources is a global priority, considering the vital importance of water for the survival and threats of all organisms on the planet. Water is an essential resource that sustains ecosystems in both terrestrial and aquatic environments, enabling fundamental human activities such as agriculture, industry and the provision of drinking water, so it is imperative to reduce the pressure on water resources in order to optimize the efficiency of the various ways of using existing water resources (Gleigk and Heberger, 2010).

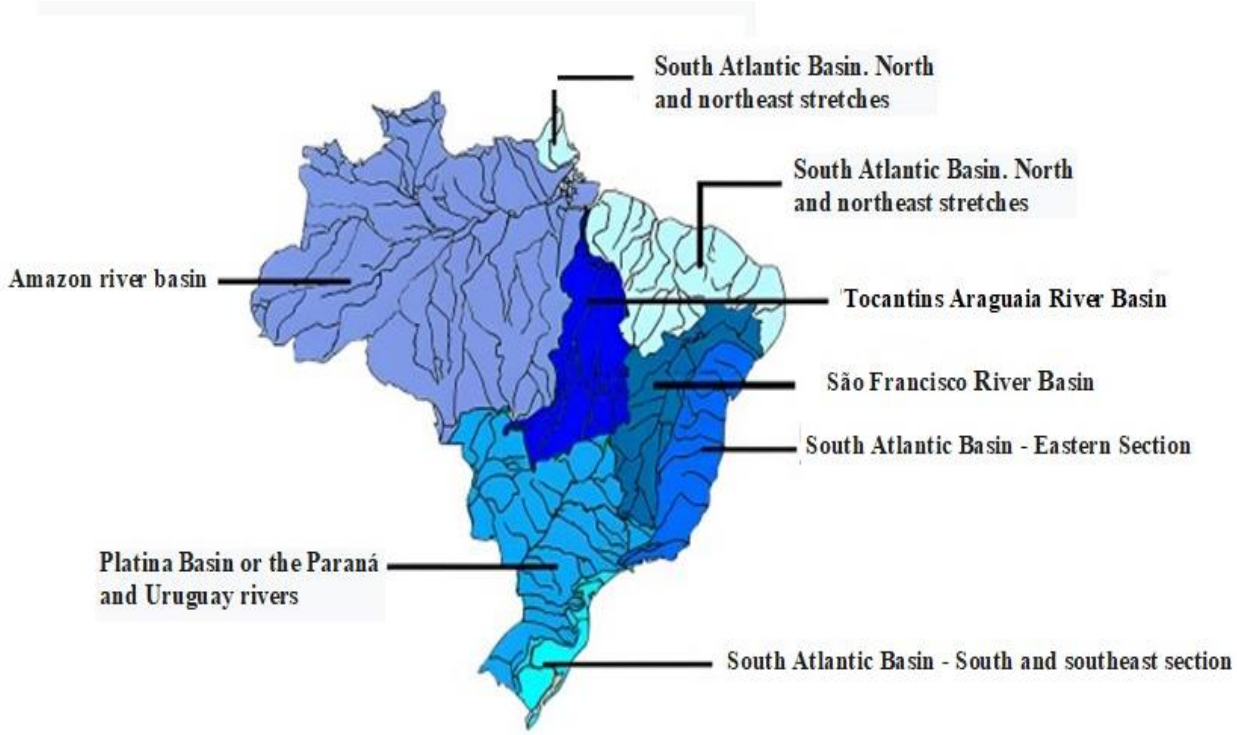
This implies that water management requires government intervention and economic solutions to internalize the external costs associated with pollution, since the pollution of one user affects the characteristics of others. In this context, economic instruments, such as charging for water use and the Pigouvian tax, are effective approaches to promoting the conservation and responsible management of water resources, and according to Tundisi *et al.* (2008), the use of these instruments to combat water pollution is extremely relevant and topical given the environmental and socio-economic challenges we face today.

Charging for water use

Charging for water use is an economic instrument provided for by legislation to promote the sustainable management of water resources. It involves imposing tariffs or fees on water users, be they companies, farmers or consumers, based on the amount of water used and the impacts generated by its use. This approach has been successfully applied in various regions, and the economic literature highlights its benefits in water management, although the OECD Report (2015) states that the invisibility of the use of the accumulation of these resources has been a general disincentive for paying users and for basin committees. In Brazil, Federal Law 9.433/1997, known as the "Water Law" or "Water Resources Law", which instituted the National Water Resources Policy, introduced charging for water use as one of the management instruments. It is applied in various river basins across the country (Figure 01), with the

aim of financing infrastructure and programs for the recovery and preservation of water resources in river basins.

FIGURE 01: Brazilian river basins.

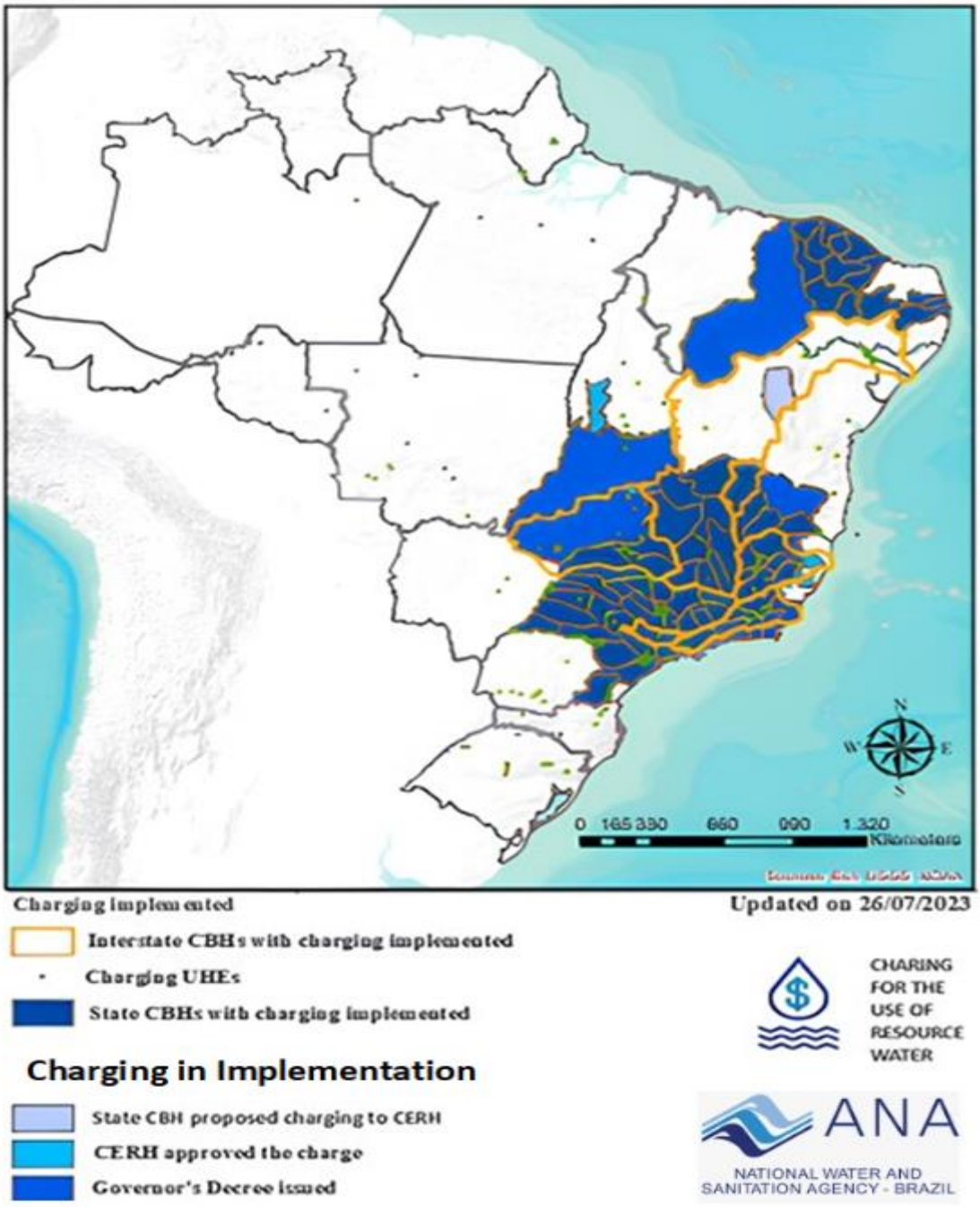


SOURCE: ANA (2023).

The management of water resources in the country depends on a series of instruments that combine traditional command and control as well as market incentives. It is regulated and expanded by federal legislation and managed mainly by the River Basin Committees and the National Water Agency - ANA (Figure 02), which defines charging for water use as one of its instruments (Borges, 2008).

It also establishes the obligation to classify bodies of water into different classes of use, carried out by the River Basin Committees (Figure 02), which set quality and quantity targets for bodies of water, guaranteeing their conservation and meeting demands. The funds collected are allocated to the Committees themselves, which must use them to recover, conserve and manage water resources in the respective river basin. The National Water and Sanitation Agency (ANA), together with the state water resources bodies, is responsible for supervising and monitoring compliance with the conditional quality and quantity targets, as well as the payment of water use tariffs. Brazilian legislation also provides for the participation of society in the management of water resources through public hearings, consultations and involvement in river basin committees.

FIGURE 02: Charging for water in Brazil.



SOURCE: ANA (2023).

The flow of charges for water use in Brazil, explained in Table 01, is a fundamental instrument for the sustainable management of water resources, encouraging responsible use and ensuring that the funds collected are reinvested in the preservation and recovery of water bodies, and is managed in a decentralized manner by the River Basin Committees, under the supervision of the National Water

Agency. Since in Brazil enforcement and punishment have not produced effective results in promoting the rational use of water resources. Brazilian legislation also provides for the participation of society in the management of water resources through public hearings, consultations and involvement in river basin committees. This guarantees transparency and representativeness in decisions related to charging for water use.

The flow of charges for the use of water in Brazil, shown in Figure 03, is a fundamental instrument for the sustainable management of water resources, encouraging responsible use and ensuring that the funds collected are reinvested in the preservation and recovery of water bodies, and is managed in a decentralized manner by the River Basin Committees, under the supervision of the National Water Agency.

FIGURE 03: Charging for water in Brazil.

SOURCE: Author**:** The authors. ANA (2019).

Several authors, such as Pizaia, Machado and Jungles (2002), defend the importance of charging for water use as a primary incentive for reducing water consumption. In Brazil, monitoring and punishment have not produced effective results in promoting rational use of water resources.

As Brazil is a country with a high tax burden, adapting existing taxes to environmental values, as well as the idea of creating new taxes, even if they are based on a noble value, is urgent, but is currently little discussed by the administrative structure itself (Valim and Oliveira 2018). Thus, the benefits sought by society and the determinations of the constitutional command in relation to the balanced environment will only be achieved when the regulation of the subject is discussed in depth, analyzing all the economic and environmental aspects, with its effective insertion into the National Tax System.

Charges for water use have different impacts in the various regions of Brazil due to the specific characteristics of each location. In the arid regions of the Northeast, charges have an impact on agriculture, encouraging more efficient practices. In industrialized areas such as the Southeast, they influence production costs, promoting more efficient technologies. In basins with agricultural potential, charges encourage sustainable agricultural practices. In rural communities, they directly affect livelihoods. In basins with conflicts, they can mitigate disputes over water. Socio-economic implications must be considered, especially in more vulnerable regions. In short, an approach that is sensitive to regional particularities is essential to ensure sustainable and equitable management of water resources throughout the country (FINKLER, MENDES, BORTOLIN, SCHNEIDER, 2015).

Pigouvian tax in the mitigation of aquatic pollution

Pigouvian theory, named after the British economist Arthur C. Pigou, is an economic theory that addresses the problem of externalities (Salles and Matias, 2022), based on the theory of social costs, and is an economic instrument designed to correct negative externalities, such as pollution. In the context of water pollution, the application of a tax on activities that generate water inputs seeks to internalize the environmental costs associated with these activities. This implies taxation proportional to the amount of pollution emitted, in order to encourage practices specific to aquatic ecosystems.

Externalities refer to the involuntary effects of an economic acquisition on third parties who are not involved in the transaction, and which are not reflected in market prices. The central concept of Pigouvian theory is the idea of correcting market failures caused by externalities. Pigou argued that in situations where externalities are present, the market is unable to allocate resources efficiently to maximize the welfare of society as a whole.

To correct this flaw, Pigou proposed state intervention through taxes or subsidies. He argues that the state should impose a tax on activities that generate negative externalities (such as pollution), in order to internalize the additional costs for society. On the other hand, for activities that generate positive externalities (such as education or scientific research), the state actually grants subsidies to create these activities.

In summary, Pigouvian theory seeks to promote economic efficiency by correcting market inefficiencies caused by externalities. This is done through state intervention to internalize the costs or benefits not reflected in market prices, maximizing social welfare. The tax is calculated to reflect the social costs of pollution, including damage to human health, degradation of aquatic ecosystems and associated economic losses.

For Colombo (2004), the polluter pays principle, which was recognized by the OECD in 2017, can be understood as an economic and environmental instrument that requires the polluter, when identified, to bear the costs of preventive measures and/or permissible measures for the elimination and/or neutralization of environmental damage. These costs must be reversed in goods and services that cause pollution in both consumption and production

Gutierrez; Fernandes and Rauen, (2017), address the importance of the conscious and sustainable use of water, highlighting the evolution of charging policies related to this resource, where they discuss the application of the "user-polluter-pays" and "protector-recipient" principles in the context of water resource management, highlighting the effectiveness of economic incentives in promoting the reduction of water consumption and changing the behavior of the population.

The convergence of water charging and the Pigouvian tax represents a synergistic approach to managing water resources and reducing water pollution. While charging for water use promotes responsible use of the resource, the Pigouvian tax focuses on internalizing the environmental costs of pollution. The integration of these instruments is not only creative and cost-effective for cleaner practices, but also provides funding for the conservation and restoration of aquatic ecosystems, which is essential for preserving water quality.

The use of the Pigouvian tax to mitigate water pollution has significant advantages, such as economic efficiency by internalizing environmental costs and providing financial incentives to reduce pollution. However, the well-applied implementation of this instrument requires attention to the assessment of economic and social impacts, as well as the definition of rates assigned to reflect the real costs of pollution.

In addition, it is essential to combine the Pigouvian tax with other policies and regulations, such as water quality standards and incentives for the development and adoption of clean technologies. Combining approaches can maximize the positive effects on water conservation and the reduction of water pollution.

In the face of criticism of the Pigouvian tax, an innovative approach to environmental management has emerged: Payment for Environmental Services (PES), based on the recipient principle, which rewards management practices in exchange for benefits to natural capital and the production of ecosystem services. In contrast to the "polluter pays" principle, which relies on deliberation to induce desirable behavior, PES is voluntary and offers positive incentives, such as money, to promote the recovery, maintenance or improvement of ecosystem services, such as water protection, carbon capture, biodiversity conservation and the promotion of scenic beauty.

Payment for Environmental Services (PES)

According to Altmann (2015), when it comes to environmental economic valuation, it is used to guide choices in the face of limited resources through cost-benefit analysis, pointing out that this approach is challenging for non-traded public goods, such as ecosystem services. And among the economic instruments used as tools to cultivate the responsible use of natural resources and deal with the positive and negative externalities generated by their exploitation, he cites Payment for Environmental Services (PES) as an instrument aimed at promoting environmental sustainability, which can be adapted to different contexts and needs.

Stanton (2015) presents PES as an instrument that rewards those who, through management practices, are required to recover, maintain or increase the production of ecosystem services. He also states that it represents an environmental management approach based on positive incentives rather than punishments, seeking to improve, maintain or recover the natural capital needed for ecosystem services, constituting a complementary tool to nature conservation.

According to the ANA 2021 Conjuncture Report, the Water Producer Program (PPA), run by the ANA, is the action that most applies PES in Brazil. It is a program that proposes to promote the conservation of water resources in the rural environment, seeking water security. The PPA has already supported approximately 60 projects in 15 states. The ANA provides support for the projects, which include a series of water and soil conservation actions, such as the construction of terraces and infiltration basins.

Charging for water use and Payment for Environmental Services (PES) share the common purpose of promoting the sustainable management of water resources and the conservation of aquatic ecosystems. Therefore, integrating these instruments into water management provides a comprehensive and equitable approach to the preservation and responsible use of water resources, benefiting both society and aquatic ecosystems.

METHODOLOGY

This is a descriptive study with a qualitative approach, using a literature review, documentary research and content analysis of Management Reports (Martins & Theóphilo, 2009).

The study proposes a literature review, analysis of success stories, current legislation and recommended practices at a global level, offering a comprehensive view of the benefits and challenges associated with these instruments. In addition, the discussion will consider the relevance of these approaches in light of the environmental and socio-economic complexities that make water resource management possible.

To achieve the proposed objective, an interdisciplinary approach was adopted, combining quantitative and qualitative analysis. The literature review will be the starting point, providing a broad understanding of the theoretical and practical advances in this field. This will be followed by an analysis of representative case studies from different geographical and economic contexts. In addition, the research will rely on primary data, where available, to provide relevant and up-to-date *insights*.

RESULTS AND DISCUSSION

From the analysis of the Effectiveness of Charging for Water Use in Promoting Efficiency in Consumption, it can be seen that charging for water use is an economic instrument that aims to promote efficiency in the consumption of this precious resource. Its effectiveness can be assessed on the basis of success stories, as well as by identifying the obstacles (Table 01) that can hinder its effective implementation.

TABLE 01: Examples of water charging in some countries

Success stories			Results	Obstacles
Kingdom United Kingdom	Experience in residential and commercial collections	It has successfully implemented a system of charging for water use, where households and businesses pay for the volume of water consumed.	It encouraged the reduction of consumption and promoted efficiency in the use of water, as well as providing financial resources for investments in water infrastructure	Resistance Political and Social Implementation costs Monitoring and Inspection Equity and Access
California, USA	Charging for water use in agricultural operations	Charging for the use of water in agricultural operations has encouraged the adoption of more efficient irrigation practices, such as drip and sprinkler irrigation.	Significant water savings and increased water sustainability	
Australia	Charging for Use and Scarcity	Introduced a charging system that varies according to water availability, encouraging users to reduce consumption during periods of	This approach has been effective in promoting water efficiency and managing demand.	

		scarcity.		
Spain (Catalonia region)	Charging for water use	It implemented a strategy that included progressive tariffs and incentives for water efficiency.	Significant reduction in water consumption in sectors such as agriculture, demonstrating the effectiveness of these policies.	
France	Charging for water use	It has internalized the environmental costs for users by charging for the use and, above all, the pollution of water resources.	Improving the quality of drinking water and reducing pollution from domestic, industrial or agricultural sources has been consolidated in France in recent years.	

SOURCE: Prepared by the authors. Perdigão (2002); Guimarães and Baltar (2012); Productivity Commission (2018).

It was identified that charging for water use may face political and social resistance, especially when introduced in regions where water was historically considered a free resource. In addition, ensuring adequate monitoring of water consumption and enforcement of the rules are critical challenges for the effectiveness of charging. Charging for water use raises issues of equity, as it affects different groups unequally. It is important to consider measures to protect access to water for vulnerable communities and ensure that the system is equitable.

The effectiveness of charging for water use in promoting efficiency in consumption depends on overcoming these obstacles, as well as adapting to local needs and characteristics. Analysis of the effects of this tax on water bodies reveals substantial economic and environmental benefits. The result has been a significant reduction in the contamination of water bodies and an improvement in water quality. It provides financial incentives for rural landowners to adopt soil and water conservation practices in order to reduce pollution and improve water quality.

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Studies have shown that PES has had a positive impact on reducing pollution in water bodies. Equity in water distribution is a critical aspect of water resource management, as it seeks to ensure that all sectors of society have fair and equal access to this essential resource. The implementation of economic instruments, such as charging for water use, can have significant implications for equity of access to water, and it is essential to consider different sectors such as agricultural, industrial, domestic and commercial, not forgetting social strata and marginalized communities such as rural and traditional communities and marginalized urban communities when analysing this impact. The inclusion of economic instruments in water resource management, such as charging for water use and the Pigouvian tax, faces significant challenges, from political resistance to legal issues and social acceptance.

Charging for water use and the Pigouvian tax are two different approaches to managing water resources. Table 02 below compares the effectiveness of these instruments in different geographical contexts and economic sectors, highlighting their advantages and disadvantages:

TABLE 02: Charging for water use x Pigouvian tax.

Approaches	Advantages	Disadvantages
Collection for the Use of Water	Focus on Efficient Allocation: Charging for water use encourages the efficient allocation of the resource, taking into account scarcity and different uses.	Complexity in Defining Tariffs: Determining fair and equitable tariffs can be a challenge, especially for vulnerable sectors
	Conservation Incentive: Encourages water conservation, as users have a financial incentive to use the resource more efficiently.	Political Resistance and Social Acceptance: May face political resistance and from users who may see charging as an increase in costs.
	Decentralized Management: Can be implemented at local or regional level, allowing for specific adaptations to particular contexts.	Infrastructure and monitoring needs: Requires investment in effective metering, inspection and collection systems.
Tax Pigouvian	Internalization of Environmental Costs: Internalizes the external costs of pollution, encouraging the reduction of pollutant emissions.	Complexity in Defining Fees: Determining the correct fee to internalize the costs of environmental damage can be challenging.
	Flexibility of Implementation: Can be applied to different sectors and pollutants, providing a broader approach to environmental management	Political Resistance and Sectoral *Lobbying*: This can be opposed by industries and sectors that resist the internalization of environmental costs.
	Encouraging Technological Innovation: Encourages the search for cleaner technologies and sustainable production practices	Need for Rigorous Monitoring and Enforcement: Requires effective data collection and enforcement systems to ensure compliance.

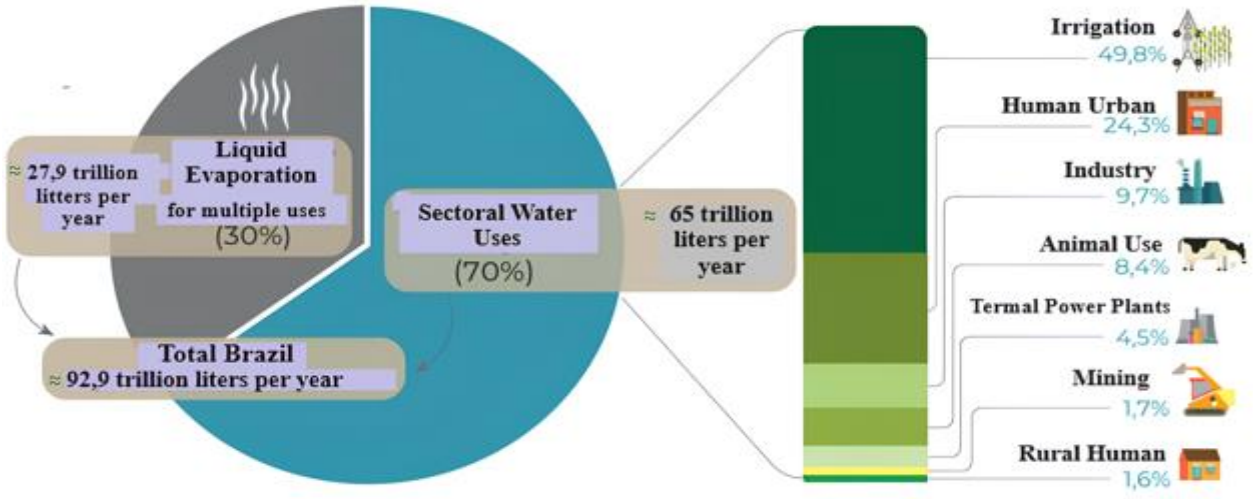
Prepared by the authors. **SOURCE:** Regis (2023); Mattos, Moita and Gonçalves (2012).

Both charging for water use and the Pigouvian tax are valuable tools in water resource management. The choice between the two depends on the specific context, including the nature of the pollution, the sectors involved and social acceptance. In some cases, it may be beneficial to combine both approaches to achieve the best results in terms of efficient water allocation and pollution reduction.

The integration of policies and economic instruments in water conservation is essential to create synergies and comprehensively address the challenges related to managing water resources and reducing water pollution. The complementarity between charging for water use, the Pigouvian tax and other management strategies allows for a holistic approach, drawing on the strengths of each instrument. This integration provides a more robust and effective framework for water conservation, promoting sustainable and equitable use of water resources.

The implementation of economic instruments in water conservation has significant economic and social impacts for different stakeholders. It is essential to consider equity in the distribution of costs and benefits, ensuring that no group is disproportionately affected. In addition, the transition to more sustainable practices can bring long-term benefits in terms of efficiency, public health and the well-being of local communities. The sectoral consumptive use of water in Brazil (Figure 04), according to ANA (2021), "occurs mainly for irrigation, human supply (urban and rural), livestock supply, industry, thermoelectric generation and mining" and the quantity and quality of water can be affected according to the specific conditions of use. As far as charging for the use of water resources is concerned, it is not a tax, but money earmarked for projects to conserve and improve water conditions in the river basins that have the instrument in place.

FIGURE 04: Water use in Brazil.



SOURCE: ANA (2019)

CONCLUSIONS

By charging for the use of water, we guarantee the continued availability of this resource, while Pigouvian taxes correct market distortions, internalizing environmental costs and promoting environmental responsibility on the part of economic agents, thus fostering long-term sustainable development.

Therefore, the study of these economic instruments is crucial to meet present needs without compromising the future, balancing the economic, social and environmental demands related to water management, we glimpse not only a panorama of current water management practices, but also a prospective vision of how the combination of charging for water use and the Pigouvian tax can be a watershed in the search for a sustainable and equitable future, where water is an accessible and preserved resource for future generations.

Charging for water use, when implemented effectively, proves to be a valuable tool in promoting efficiency in consumption. Success stories, such as in Australia and Catalonia, France, among other countries, illustrate the tangible benefits of this approach. However, overcoming obstacles such as political resistance and the complexity of setting tariffs is crucial to the effectiveness of this policy. By addressing these challenges strategically, charging for water use can play a significant role in the sustainable management of water resources.

Analyzing the effects of the Pigouvian tax on reducing water pollution can reveal how an effective and economically viable approach can promote cleaner and more sustainable practices. The case studies demonstrate the tangible economic and environmental benefits of this strategy, highlighting the importance of economic instruments in water resource management.

Thus, ensuring equity in the distribution of water is a fundamental principle in the management of water resources. The implementation of economic instruments, such as charging for water use, requires a careful approach to ensure that all sectors and social strata have fair and equal access to this essential resource. Well-designed policies that take into account different realities and needs are essential to promote equity in water management.

However, there is an interconnection between charging for water use, the polluter pays principle, the Pigouvian tax and Payment for Environmental Services (PES) in terms of environmental management and the internalization of environmental costs. The interconnection between these concepts lies in the search for sustainable management of natural resources, especially water. It can be seen as a practical application of the polluter pays principle, as users pay for the water they consume, encouraging more efficient and responsible use. Similarly, a Pigouvian tax on activities that impact water quality levels would be a way of applying the polluter pays principle.

PES can also be related, as it can be implemented to promote the conservation of natural areas that are important for protecting water quality. With PES, environmental service issues that contribute to the conservation of water resources can generate financial incentives. Therefore, all these concepts work together to promote the responsible and sustainable management of water resources, encouraging practices that benefit both the environment and society.

The funds collected are used to finance projects and actions aimed at managing water resources. This includes the implementation of water treatment systems, preservation of aquifer recharge areas, among other initiatives. However, the charge must be established taking into account equity criteria, ensuring that all users contribute fairly and proportionally, taking into account different sectors and socio-economic conditions.

The effective implementation of water charging in Brazil has faced challenges, such as defining charging criteria, the need for metering and monitoring infrastructure, and raising users' awareness of the importance of responsible water resource management. Charging should be complementary to other management instruments, such as granting water use rights and drawing up river basin plans, in order to promote an integrated and effective approach to water resource management, contributing to the promotion of sustainable development, encouraging the circular economy and more efficient production practices in the use of water.

In short, charging for water use in Brazil plays a crucial role in promoting the sustainable management of water resources, in line with principles of equity, efficiency and socio-environmental responsibility. However, its effectiveness depends on integration with other management strategies and the active involvement of all sectors of society.

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