The role of the regulator function of groundwater tax on the conservation of water resources

Dewi Mulyanti1, Ida Farida1, Nuriyah1, Emma Amalia1, Yadi Setiyadi1
1Magister of Law, Universitas Galuh, Indonesia

Abstract
The use of water is highly needed for human primary needs and industry. Thus, the government issued a policy related to the function of regulating groundwater taxes to regulate the use of groundwater to make it in harmony with the sustainability of the preservation of water resources. The regulatory function of groundwater tax is not optimal and tax collection plays a greater role in local government revenue, so it does not support the conservation function of water sources. Thus, this research is important for researchers to formulate ‘what is the role of the regular function of the groundwater tax that applies in Indonesia?’ and ‘what is the regulatory model which can synergize groundwater taxes with water resource conservation?’ This research uses several methods in data collection and compilation. The approach method used in this study is normative juridical under qualitative data analysis. The analytical descriptive method is employed to comprehensively describe and systematically examine primary and secondary data, which then analyzes the research object to provide a clear picture connected to relevant legal theories to find the government policy as the concept of thought. The research result showed that the function of the groundwater tax regulator has not played a role in the conservation of water resources. The role of regular function of groundwater tax requires it to be used to control the sustainable use of groundwater for the greatest prosperity of the people, both now and in the future. Through “emarking or emarked tax,” a groundwater management model that synergizes with soil conservation can be applied. This means that groundwater tax revenue is allocated for the conservation or restoration of water resources due to groundwater utilization.

Keywords: Conservation; Groundwater tax; Water resource

INTRODUCTION
Groundwater is an important resource to support economic growth and community development (Lili et al., 2020). Based on the study, annual population growth has a significant effect on the demand for water needs (Arfanuzzaman & Atiq Rahman, 2017). For the community in general, groundwater is an option as a source of water needs. This is related to the fact that during the dry season, the amount of surface water decreases rapidly which is then followed by a decrease in water quality that makes water not good to use and groundwater supply is much larger and easier to obtain through simple methods than any other water sources. Besides, water storage and transmission networks to distribute it are not required, so it does not require costs. This is one of the elements that influence how much groundwater is used to meet the needs of households and industrial companies.

Based on some studies from 37 countries, the findings show that countries with relatively high economic and social development (by global standards), tend to have a gap between social development and the productive use of water resources (Morris, 2019). This condition influences the government and industry to be able to provide policies related to monitoring the use of sustainable groundwater (Morris, 2019).

In supporting the management of groundwater sources from an economic instrument standpoint, the government can issue policies in terms of the taxation system, licensing system, and regulation as control over groundwater production (Golovina, 2017). The large use of groundwater
by industrial companies has become a potential for regional governments as a source of regional income through regional taxes regulated in various regulations. The latest based on Law Number 28 of 2009 concerning Regional Taxes and Regional Levies as amended by Law Number 1 of 2022 concerning Financial Relations between the Central Government and Regional Governments.

The groundwater tax, which functions more as revenue/budgetary, causes the groundwater extracted and used by companies without the restriction of volume and depth. Meanwhile, there are several essences of tax functions, namely budgetary functions, redistribution, *regulerend* functions, and stability functions (Ilyas & R, 2007). Ideally, the regulatory function of groundwater tax is important in the management of groundwater extraction and utilization. In addition, the tax on the collection and use of groundwater by companies can be significantly reduced, so that people will use water efficiently (Arfanuzzaman & Atiq Rahman, 2017).

An increase in groundwater extraction without proper planning and adequate groundwater conservation efforts can result in the degradation of groundwater sources. On one hand, the water supply for various needs tends to keep decreasing, both quantitatively and qualitatively. On the other hand, the water demand tends to increase, so problems of water resource management increase which causes an imbalance between the supply and demand for water. This situation has been and is currently taking place in several areas of the basin. In addition, the method of extracting groundwater that is not by the principles of good hydrology will have a serious negative impact on the sustainability and quality of groundwater resources, groundwater level, land subsidence that occurs along roads or buildings, and seawater intrusion which can become an indicator of the decreasing amount of groundwater.

Ideally, the use of groundwater must refer to the environment because the supply and potential of groundwater in an area are determined by natural factors. The first step in an inventory of groundwater potential is an inventory of all aspects of existing groundwater to determine its potential, through mapping, investigation, research, exploration, evaluation, collection, and management of groundwater data (Rejekiningrum, 2009).

Thus, this research is important to determine the groundwater tax model in a regular function that synergizes with efforts to conserve water resources sustainably. This research relates to administrative law in tax regulation and environmental law. Based on this background, the identification of problems in this research includes: (1) What is the role of the *regulerend* function of the groundwater tax that applies in Indonesia? (2) What is the regulatory model that can synergize groundwater taxes with the conservation of water resources?

**METHOD**

This study uses a normative legal research approach (Ibrahim, 2013). The research specifications used are analytical descriptive and analytical prescriptive. Based on the research approach and specifications, the data collection techniques used in this research are library research (Soekkanto, 2007). Library research was conducted to obtain secondary data, namely primary legal materials, secondary legal materials, and tertiary legal materials obtained through libraries and online literature. Data analysis uses a qualitative method through exposure which describes the object being studied by connecting the theory function to the research objectives which then formulates a more appropriate theory for the result of this study (Moleong, 2017). These various methodologies are used as a process of simplifying data into a form that is easier to read and interpret (Singarimbun & Effendi, 1989).

**RESULTS AND DISCUSSION**

**Groundwater tax as the potential regional tax**

To accelerate the community’s prosperity, thus the local government was established by considering economic capacity, regional potential, area size, population, and consideration of socio-political, cultural, defense, and security aspects and considering other requirements to organize,
realize the goals of developing a region, and receive regional autonomy (Sunarno, 2006). The implementation of decentralization requires the division of government affairs between the government and the autonomous regions (Syafrudin, 2006). In line with the principle of decentralization, B.C Smith’s opinion as quoted and translated by Siswanto Sunarno defines decentralization as a process of approaching local government which requires delegation of power to subordinate governments and distribution of power to the regions. The central government is required to hand in the power to local governments as a form of implementing decentralization (Smith, 1985).

Delegation of government authority in the framework of implementing decentralization must conclude the delivery of financing, infrastructure, personnel, and documents by the delegated authority. One of the consequences of decentralization is that regions are required to be able to develop and optimize all existing potentials. Financing regional autonomy or fiscal decentralization is regulated in Law Number 28 of 2009 concerning Regional Taxes and Regional Levies which was amended by Law Number 1 of 2022 concerning Financial Relations between the Central Government and Regional Governments. The government grants the authority to regional governments to release revenue policies (tax policies) to strengthen the ability to finance development programs and administer regional governments through increasing revenues, especially those originating from Regional Original Revenues. One of which is regional taxes.

Tax is the transfer of wealth from the private sector to the public sector based on laws that can be enforced with no reward (tegenprestaie) which can be directly shown, which is used to finance public expenditures as a means of encouraging, inhibiting, or preventing the achievement of stated goals. exist outside the field of state finance (Soemitro, 1992). Meanwhile, regional taxes are contributions of taxpayers to regions that are owed by individuals or entities that are coercive based on law, by not receiving compensation directly and used for regional needs for the greatest prosperity of the people (Darwin, 2010).

Based on Law Number 1 of 2022 concerning Financial Relations between the Central Government and Regional Governments, groundwater tax is a type of tax collected by district/city governments as a potential of regional income. Groundwater tax abbreviated as PAT is a tax on the extraction and/or utilization of groundwater. The PAT object is the extraction and/or utilization of groundwater and what is excluded from the PAT object is the extraction for basic household needs, irrigation for smallholder agriculture, smallholder fisheries, smallholder livestock, religious purposes, and other activities regulated by regional regulations.

The function of water ground tax Regulerend in Indonesia

The groundwater tax collected aims to increase tax revenue in the region. The role of regional taxes and regional retribution as the main regional revenue in addition to the balancing funds obtained from the exploitation of natural resources determines the strength of the Regional Revenue and Expenditure Budget (APBD). The problem is, the continuous collection of groundwater tax that is not limited by the volume of withdrawal will have an impact on water resources. Thus, researchers agree with Heru Priyono that the collection of groundwater tax must be followed by the management of the existence of groundwater as a source of water to preserve natural resources and a sustainable living environment (Priyono, 2014).

The regional tax function consists of a budgetary function, a regulerend function, a democratic function, and a redistribution function. In addition to budgetary in the public sector, groundwater tax functions to collect as much tax money as possible by the applicable law which will be used to finance state expenditures consisting of routine and development expenditures. In case of a surplus, it will be used as government saving for government investment. The function of regulerend is a tool to achieve certain goals beyond the financial sector. The regulerend function essentially functions to control the extraction and/or utilization of groundwater.

Law Number 18 of 1997 concerning Regional Taxes and retribution initially regulates the use of surface water and groundwater. Then, Law Number 34 of 2000 concerning Amendments to the
Law of the Republic of Indonesia Number 18 of 1997 concerning Regional Taxes and Regional Retribution. Law Number 28 of 2009 concerning Regional Taxes and Regional Levies amended by Law Number 1 of 2022 concerning the financial relationship between the Central Government and Regional Governments which was drafted as a basis to put taxation as one of the manifestations of state obligations which is a means of participation in state financing and national development.

Regional tax and regional retribution are important sources of regional income to finance regional administration and regional development. Whereas the groundwater tax based on Law Number 32 of 2009 concerning Environmental Protection and Management is known as Environmental Economic Instruments which means that in order to preserve environmental functions, the Government and regional governments are required to develop and implement environmental economic instruments which include the development planning, economic activities, environmental financing, and incentives and/or disincentives. Incentives and/or disincentives referring to Article 42 paragraph (2) letter c are among others implemented in environmental taxes, retribution, and subsidies. This is intended to make a balanced fund for the conservation of water resources that can be sustainably preserved.

Groundwater tax on the utilization and management of groundwater should regulate the control of water resources. Law Number 28 of 2009 Concerning Regional Taxes and Regional Retributions (UUPRDD) including other laws and regulations regarding the regulation of groundwater taxes has not touched the balance against environmental damage due to groundwater utilization. Government policy in Law Number 28 of 2009 concerning Regional Taxes, Regional distribution, and other regulations only regulates it as a source of regional income so that local governments are granted the authority to collect groundwater taxes based on the management and utilization of groundwater with maximum revenue realization without considering the impact on the environment. In several districts/cities, Revenue from groundwater tax has not established a balancing fund and allocation for the balance of environmental resources until now, especially the collection and utilization, groundwater whose object is collected in the form of groundwater tax.

The renewal of regional taxes and regional retribution has not yet touched the regulation of the balance of environmental preservation, especially for the type of groundwater tax on the conservation of water resources. Whereas, the sustainable development goals function as a global development agreement including Indonesia. Protecting the environment is a worldwide obligation including protecting clean water sources and proper sanitation as basic human needs.

Ideally, a groundwater tax using a regular instrument has more function to regulate the provision of an allocation of tax revenue to the counterweight in controlling the extraction and/or utilization of groundwater. In practice, groundwater tax rates are still very cheap, even the extraction and/or use of groundwater is carried out excessively and uncontrollably so that it has an impact that keeps decreasing the quality and quantity of water resources. Thus, it is necessary to have a model that can control the extraction and/or use of groundwater by virtue of the use of some taxes to tackle the environmental damage.

**Regulatory model synergizing Groundwater Tax to the conservation of water resources**

The important role of the groundwater tax is as a regular function in the use and management of groundwater, it is necessary to have very strict restrictions in an effort to maintain water sustainability for the life of the nation. So, six limited principles are established, namely: (a) every water exploitation must be controlled by the state, intended as much as possible for the people’s prosperity; (b) the people's right to water must be fulfilled by the state; (c) environmental preservation must be taken into consideration, because it is one of human rights; (d) environmental preservation must be taken into consideration, because it is one of human rights; (e) supervision and control by the state over water is absolute, because water is an important branch of production and it affects the livelihood of many people; (f) as a continuation of the right to control by the state, the main priority given to the exploitation of water is to State-Owned Enterprises or Regional-Owned
Enterprises; and (g) if all the mentioned restrictions have been fulfilled and there is still water available, it is possible for the Government to grant permits to private businesses to exploit water under certain and strict conditions.

The provision of the groundwater tax on the utilization of groundwater prioritizes the function of tax regulation (regulerend) first as one of the efforts to restore groundwater condition. One of the government’s efforts to provide funds for groundwater rehabilitation is to set a tax on groundwater extraction and utilization. In practice, revenue derived from groundwater taxes cannot replace or provide protection for repairing damaged water resources due to the extraction and use of groundwater until now.

On one hand, organizing and utilizing water resources is an economic commodity, on the other hand, it is human a primary need and human right. A human can not live without water, so water management must be taken into consideration and the state must protect, respect, and fulfill it. There is the possibility to set everything up using a licensing system (vergunning), even though now the state is not possible to carry out its obligation to cover the water need because it needs funds and effort.

Pigou stated, known as Pigouvian taxes, that tax functions to regulate a community’s lifestyle and activity. The writer agrees with A.C. Pigou in Ecological Economic Principle and Application concerning the problem of internalizing environmental externalities. The simple solution of imposing a tax equal to the marginal external cost. This would force the economic agent to account for all economic costs, creating an equilibrium in which marginal social costs were equal to marginal social benefits. A.C. Pigou’s theory is known as Pigouvian taxes (Daily & Farley, 2004).

Regional governments must take into consideration the continuity of groundwater availability in managing and collecting groundwater taxes so that the results obtained through tax collection can be allocated for the benefit, conservation, and management of groundwater availability. The existence of groundwater taxes obtained from the community is reallocated or there is a balance to maintain the availability of groundwater so that the quality of groundwater can be maintained.

Regarding the use of groundwater, the tax regulatory functions to regulate the management and utilization of groundwater either the groundwater quantity or the regulation of the restricted area to utilize the groundwater. The goal is the water supply can be sustainable. Another goal of the “regulatory concept” of the tax is addressed for the regional government with the authority to collect the groundwater tax.

This research employed the comparison from the regulation of taxation in the Netherlands referring to the provisions of the Dutch constitution which requires that all kinds of taxes and other retributions imposed by the state must be based on the law (Article 104 of the Dutch Constitution). In the Netherlands, there are 5 (five) areas of collection (with the authority) of collection in the Netherlands as seen from the collection, namely the center (central), an industrial area (statutory industrial organizations), provinces (provinces), municipalities (municipalities), and water control authorities (authorities for water control). In the Netherlands, the government takes control of water management. All kinds of water-related tasks are regulated under public law and carried out by central, provincial, and local water authorities financed by the State’s general fund or from revenue generated by various decentralized taxes. Unlike provinces and municipalities which are mostly financially dependent on the central government’s financial support (through grants from Provincial and Municipal funds), Regional Water Authorities are largely financially independent. This independence is a result of their wide tax area. Since 2011 the regional water authority has also made financial contribution to strengthen flood defenses through annual payments to the Ministry of Infrastructure and Environment.

The financial independence of the Regional Water Authority resulting from the tax system has constructed an important model within the Regional Water Authority of the State of the Netherlands. The organization, finance, and management of water in the Netherlands have been determined historically, but it is also based on the idea that water management should count as public property. This is also due to the geographical position of the Netherlands, in particular, due to
its population, in good and sustainable water management. It means water management in the Netherlands has semi-collective commodity characteristics. Therefore, it is difficult to imagine it as a form of commercial service. In 2009, the Regional Water Authority Act prompted a number of changes in the water authority financing system. Since 2009, for example, the "natural area" category is no longer part of the "underdeveloped" category in the allocation of costs but it is a separate category and wastewater treatment fees which are only related to wastewater purification costs. The costs incurred by the Regional Water Authority to protect and improve the quality of surface water are financed through water management fees and water pollution fees (Authorities, 2017).

Therefore, it is necessary to have a regulatory model for groundwater tax that synergizes with groundwater conservation. The author agrees with the concept of "emarking or emarked tax". The concept of earmarking is defined by Buchanan as, "... the practice of designing or dedicating specific revenues to the financing of specific public services. It is discussed under such headings as "special funds", "segregated accounts", "segregated budgets", "dedicated revenues" (James, 2007). An earmarking concept is an exceptional form of the general tax revenue concept in financing state expenditures. It is stated that all revenues from certain taxes are separated from general income. It can only be used to fund certain government expenditure programs and fully fund that programs. In other words, income from the revenues of Groundwater tax is allocated for the conservation or restoration of water resources originating from groundwater utilization. The fact is that until now, tax earmarking that is directly related to the environment has in fact not been fully implemented. In fact, apart from the motor vehicle tax, there are other types of taxes that are relevant to natural resources, such as groundwater taxes, surface water taxes, and taxes that are imposed on the utilization of natural resources, ideally not prioritized in the revenue function but are obliged to protect and maintain environmental quality in the regions.

The extraction of groundwater carried out through drilled wells and the volume of activities which is not limited will have an impact on soil damage and can reduce the availability of water. In the future, it is possible that sources of clean water in Indonesia will gradually disappear. So, in this era of sustainable development, water resource management reform is a primary need. The challenge lies in the availability of funding sources and the political will of the government needed to overcome this problem. Conceptually, earmarking is related to financial needs by means of the achievement of the ideal goal in fulfilling sustainable development goals (SDGs). The allocation based on the law provides certainty about the provision of a budget from tax revenues to finance public needs.

Until now, the Special Allocation Fund (DAK) for the environment sector and a number of Regional Incentive Fund (DID) schemes have been relied upon to control environmental damage in the regions. However, regional funding in controlling environmental damage has not been able to sustain including revenue from groundwater taxes. So, for the sake of sustainability, it is necessary to have other sources considering that not all regions have the same political will. The provision in regulation in the form of regional tax laws that apply earmarking to types of taxes such as surface water tax, groundwater tax, and motor vehicle fuel tax will have an impact on the certainty of maintenance of environmental damage resulting from the use of each object. The principle of certainty offered by this system will certainly support strengthening regional competitiveness in solving the problem of limited environmental conservation costs. Local governments are forced to focus on improving environmental quality through the existence of a policy framework as a fundamental foundation.

The legislative process in local taxes is needed to accommodate the limited financing of controlling environmental damage at this time due to the extraction and use of groundwater. Changes in Regional Tax and Regional Retribution regulations are urgently needed in the implementation of emarking on groundwater and surface water taxes. Synergizing groundwater tax collection with groundwater conservation through the concept of marking tax can align the achievement of SDGs that do not conflict between state/regional revenues and the protection of
natural resources. It is time for environmental conservation to become part of economic development activities through local tax reform without creating high-cost economic conflicts. Earmarks are a counter-achievement according to their designation and must be determined in law. Finally, there is certainty related to the existence of counter-achievement obligations in the form of services and the amount of achievement allocated by the local government for services of the type of groundwater tax and surface water tax.

Increasing water infiltration areas and building infiltration wells of water for several industrial companies must be socialized to the community, especially industrial businesses which function to keep the balance of the area's hydrological cycle. The balanced hydrological condition is expected to give a negative impact on the community so companies that use groundwater and have water infiltration areas must have balance to conserve water resources. The government has made an effort to issue a policy to limit the use of groundwater as a goal of balancing environmental functions. However, permits to establish industrial companies in groundwater crisis areas are not restricted which makes it difficult to maintain a balance of water resources.

The role of the community is also very important, especially those who live upstream, as a determinant of the impact caused by the extraction and use of groundwater. Collecting additional groundwater tax, in particular the Pigovian tax, has the aim to regulate the extraction and utilization of groundwater so that it complies with the groundwater tax provisions. The regulation of the collection and utilization of groundwater aims to avoid fraud carried out by business actors related to groundwater debit used. Thus, the government needs to implement a strategy related to groundwater tax by means of a regulation or a policy which of course can reduce the use of groundwater or turn to maximize the use of surface water. The use of groundwater can be seen from its zone, particularly for areas with critical zone conditions by limiting the use of groundwater by taxpayers or by raising the base price of groundwater to a very high rate.

Groundwater utilization control policy is a very important element in order to control environmental impacts. Legitimacy in groundwater management activities is a form of groundwater licensing. Permits can be revoked if the implementation causes environmental damage and permits can be granted to areas with safer groundwater conditions to be possibly extracted without impacting the environmental degradation of groundwater. Permits related to the use of groundwater are required, including the drill and the depth of the groundwater which decrease the groundwater supply, the groundwater level, and groundwater quality, changes in groundwater patterns, and disrupt the aquifer system.

The utilization of groundwater is one of the local tax revenues in the form of groundwater tax. Based on the abundant potential of groundwater in Indonesia, the groundwater tax has the prospective and large potential in the future by virtue of the increasing demand for groundwater utilization, especially for industrial purposes, which of course will be able to increase PAD revenues. However, in line with its development, there is no balance between local revenue from groundwater tax with the damage arising from the extraction and use of groundwater. Moreover, there are still taxpayers who do not fulfill groundwater tax payments in several regions in Indonesia and the lack of funding for groundwater conservation caused by the use of groundwater. So the government needs to think about efforts to switch to the use of surface water sourced from rivers, lakes, wetlands or the sea.

The results consist of a clear summary of the findings, a comparison of these findings with previous research, as well as a discussion exploring the findings. You can write down the results and discussion in separate subsections or one whole. You can include tables, figures or equations with the following rules.

**CONCLUSION**

Based on this description, the conclusion of this research includes (1) the groundwater tax regular functions to control the sustainable use of groundwater for the greatest prosperity of the people for now and in the future. This is in line with the regulatory function of the tax, but the
politics of legislation related to the groundwater tax currently only prioritizes the budgetary function. (2) the regulation model of groundwater tax that synergizes with groundwater conservation, can be conducted through "emarking or emarked tax". It means that the revenue from groundwater tax is allocated for the conservation or restoration of water resources as a result of groundwater utilization. Surface water taxes and taxes imposed on the utilization of natural resources are ideally not prioritized in the revenue function but are obliged to protect and maintain local environmental quality. Conceptually, earmarking is related to financing needs by achieving ideal goals in fulfilling sustainable development goals (SDGs). The allocation mandated in the Law confirms the provision of a budget from tax revenues to finance public needs.

The suggestions in this research include (inviting) groundwater to implement the budgetary function and regularend function simultaneously so that groundwater tax does not only function as regional income but also as a function of water resource conservation. The politic of groundwater tax law puts budgetary and regularend functions in harmony. The Central Government should issue a regulation on setting groundwater tax rates for district/city governments by implementing the emarking tax so that groundwater tax rates are not solely determined by regional original revenue targets.

**Limitations and future direction**

The research entitled *the role of the regularend function of groundwater tax on water resources conservation* has the scope of state administrative law and environmental law with the research limitation in the form of policy provision concerning the regulations that can synergistically regulate groundwater tax with water resource conservation. However, this research needs further research related to the regulation pattern of the use of groundwater which switches to the use of surface water in order to maintain the sustainability of good quality and quantity of groundwater.

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**Declarations**

D.M. is major author of this manuscript and I.F., N, E.A. and Y.S. is co-author. D.M. designed the research, collected and analyzed the data. D.M., I.F., N, E.A. and Y.S. and approved the manuscript. The authors state there is no conflict of interest.

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