

Regulating transboundary groundwater: big challenges for Brazil

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ABSTRACT

Brazil is considered to be a very wealthy country in terms of fresh water resources. It owns two of the largest river basins: the Amazon and La Plata. It shares with Argentina, Paraguay and Uruguay one of the hugest aquifers: the Guarani Aquifer. All this wealth brings up legal e political challenges, such as the following questions: How is the management of water resources in Brazil? What are its instruments? Is the management of surface and groundwater integrated? Is it possible to manage jointly transboundary waters? This paper intends to face these questions by studying the case of the Guarani Aquifer. At first, describing and analyzing the Brazilian domestic laws that apply to it and to general water management. Secondly, by the comparison of the recent treaty on the Guarani signed by Brazil, Argentina, Paraguay and Uruguay and the United Nations General Assembly Resolution 63/124 (2009) on the Law of Transboundary Aquifers. The gap between domestic law and international soft law is still impressive, but analysis of the Guarani Aquifer case leads to the conclusion that Brazil is beginning to face the issues of transboundary groundwaters.

Key words: Transboundary Groundwater, Brazilian Legal Framework, Guarani Aquifer, International Law.

1. INTRODUCTION

Brazil owns approximately 13% of the world’s fresh water, two of the biggest river basins in the world lay in Brazil’s territory and both cross the border: the Amazon and La Plata. One of the biggest aquifers in the world, the Guarani Aquifer covers a total area of almost 1,2 million squared kilometers; most of it is in Brazil, but also in Argentina, Paraguay and Uruguay. The Brazilian part of the aquifer extends through 8 States of the Federation: Rio Grande do Sul, Santa Catarina, Paraná, São Paulo, Mato Grosso, Mato Grosso do Sul, Goiás and Minas Gerais. Besides the Guarani, Brazil shares another 10 aquifers, according to ISARM studies. All this wealth, however, demands political decisions, made according to a clear legal framework, strong institutions and an up-to-date water management system.

This article aims introducing the Guarani aquifer case, in two parts. First, there must be an overall view and evaluation of the Brazilian framework for water, including one of its weaknesses, the fact that it doesn’t integrate groundwater. In the second Part, the international law applicable to the Guarani, in other words, the treaty on the Guarani Aquifer, recently signed by Argentina, Brazil, Paraguay and Uruguay must be analyzed. The method will be to compare the treaty with the United Nations Resolution on the Law of Transboundary Aquifers, to make it visible how comprehensive are the commitments accepted by the members of Mercosur, not failing in making a good profit of the UN disposal.

2. THE GUARANI AQUIFER

Since the Guarani Aquifer was discovered, in 1996, it became the focus of a variety of agents from the economic, political and social fields, whether or not from the Mercosur region. It was first the object of study or research in public universities (Taks, 2009).

There was a concern to investigate the actual conditions of the aquifer: its extension, the continuity of the geological formation beneath the borders and the movement of ground water. It was also necessary to think about a common framework between Argentina, Brazil, Paraguay and Uruguay for

the management of groundwater. The political connotations of the Guarani were soon prominent: questions about sovereignty and regional integration. The universities involved in the study of the Guarani proposed a research project and sought support of the States, which was denied. Then the World Bank through the Global Environmental Fund - GEF decided to give a loan, being given the coordination to the Organization of American States (OAS). The Guarani Aquifer System Project had a total cost of 26 million dollars, with 12 million dollars counterpart supplied by Argentina, Brazil, Paraguay and Uruguay (Caubet, 2006).

The issue was soon brought to the Mercosur. In July 2004 an *ad hoc* High Level Group was formed in order to study the possibilities of an agreement on the management of the aquifer. The draft agreement prepared by the *ad hoc* High Level Group has been delivered to the Common Market Council of Mercosur in December 2004, but only recently signed, in August 2010 (Taks, 2009).

It is known today that the Guarani Aquifer System constitutes "a vast rock strata (geological formations) with aquifer characteristics, forming a vast groundwater reservoir (hydro geological basin)". Its area is calculated in 1,087,879 km². The aquifer is present in the subsoil of Argentina (20,98%), Brazil (61,65%), Paraguay (8,05%) and Uruguay (3,32%), and its geological formation is a continuous structure in the four countries. The water is renewable but its circulation is slow and hampered by hydraulic barriers and natural compartments. The groundwater presents heterogeneities and its characteristics vary from one region to another, including: chemical and hydraulic differences, and some others of accessibility and temperature (OAS, 2009).

3. AN OVERVIEW AND EVALUATION OF THE LEGAL FRAMEWORK OF WATER RESOURCES MANAGEMENT IN BRAZIL

The first legal document that deserves mention, when studying water issues in Brazil, is the 1988 Brazilian's Constitution. Before 1988, it was possible to meet "private water" as a legal category, according to real practice. Under the Constitution's precepts, the surface water (rivers and lakes) that exists in the territory of two or more States, is under the jurisdiction and control of the Federal government: the Union. The same occurs with: a) waters that constitutes border with other countries, b) water which comes from or goes to another country's territory; c) the reservoirs built with federal funds (art. 20, III), and d) all mineral resources, including those of the underground (art. 20, IX and art. 176). On the other hand, surface water that does not belong to the Union (according to the above mentioned criteria) is under States jurisdiction. Likewise, groundwater in general belongs to the States (art. 26, I) (Brasil, 1988).

Under the Constitution, the Federal government has the competence to legislate on water resources. It is thereby allowed to establish a National Water Resources Management System and to define criteria to authorize its uses (art. 21, XIX). Therefore, in 1997 was enacted the Federal Law n. 9.433 that creates the National Policy of Water Resources and establishes the National Water Resources Management System. The Law's first article gives the grounds of the national policy for water: water is a public good; a limited natural resource with economic value; in the case of scarcity, priority of use is for human consumption and animal thirst-quenching; management should favor multiple uses; hydrographic basin is the territorial unit to implement the policy; water resources management should be decentralized and take into account the participation of the government, users and communities (Brasil, 1997).

The goals of the national policy of water resources are (according to art. 2): the guaranty, for the present and future generations, of water resources in adequate quality for its use; the achievement of sustainable development, rational and integrated use of water resources; the prevention of and reaction against "hydrological critical events" due to natural causes or inadequate use of natural resources. The law creates instruments that are supposed to achieve these goals. The instruments are, first of all, charging a price for the use of water resources. The use of bulk water depends on an administrative act

of authorization called grant (*outorga*). Other instruments are: the development of plans of water resources, the classification of water bodies according to its uses and the establishment of a data system (art. 5). One of the main critics that can be made on this law is fact that it is based only on the idea of water as a limited natural resource with economic value, with no regard whatsoever to social, environmental, cultural and religious values of fresh water. The intention is to rationalize the use of water, by granting it a price. This option has been implemented in 4 river basins, 13 years after the law was enacted. Another problem in the policy implementation is the fact that water grants have been given before the existence of a management plan and the classification of water bodies (which should include the priority of uses): both instruments should precede the grants, according to art. 13 of the Law (Brasil, 1997).

The biggest flaw of the Law is the fact it has no regard to integrate the management of surface water with groundwater. In fact, the law barely mentions groundwater, except to prescribe that groundwater exploitation depends on an official grant (art. 12), the same one needed for surface water. Besides that, drilling wells to extract underground water or to operate these wells without proper authorization is against the Law (art. 49, IV) and one of the penalties is the order to stop the operation, revoke the license and plug the well (art. 50, IV). Even though the Law mentions the idea of “integrated management”, it provides no instruments to do so, consecrating an idea of hydrologic circle disconnected from the groundwater (Rebouças, 1999). But the integration is being made *infralegis* through the Resolutions of the National Council of the Environment (*Conselho Nacional de Meio Ambiente – CONAMA*) and the National Council of Water Resources (*Conselho Nacional de Recursos Hídricos – CNRH*). The documents on groundwater enacted by these institutions are: Resolution of the National Council for the Environment n. 396, from 3 April 2001 and Resolution of the National Council of Water Resources n. 15, from 11 January 2001; n. 22 from 22 May 2002; n. 91 and n. 92, from 5 November 2008 and Resolution n. 107, from 13 April 2010.

It has to be emphasized that Brazil has two different legal regimes for groundwater. As mentioned above, the Brazilian Constitution establishes that groundwater belongs to the States, but mineral water (all mineral resources, including those in the underground) is under federal domain. So there are two different legal regimes for groundwater and mineral water and two different administrative acts to allow the use of one or another. The groundwater considered to be mineral is subject to the Mining Code (*Decreto-lei* n. 227/67) and the Mineral Water Code (*Decreto-lei* n. 7841/45); its exploitation depends on authorization from the National Department of Mine Production (*DNPM*). Groundwater in general is subject to the license of the State, according to its own state policy (the guidelines of which are given by the National Policy) (Camargo, Ribeiro, 2009).

Besides it is weak in terms of groundwater, the National Policy for Water Resources Law is almost silent about transboundary waters: the single legal provision on the subject is the one on art. 39 § 2º of the Law n. 9433/1997, saying that in case of a transboundary basin, the Foreign Affairs Ministry (*Ministério das Relações Exteriores*) must have a chair in the River Basin Committee (Brasil, 1997). But the issue is much more delicate. It was said that the Constitution prescribes that groundwater belongs to the States. But the federal government argues that, by analogy with surface water of federal concern, all other waters should be legally added to the federal dominium. Since 2000, there’s a proposal to emend the Constitution (*PEC* n. 45/2000) on that issue, placing all transboundary groundwater under federal jurisdiction. This would boost the main concern of the federal government in order to extend its control over the Guarani Aquifer (Coimbra, 2009).

4. OVERVIEW AND EVALUATION OF THE GUARANI AQUIFER TREATY

The United Nation’s General Assembly adopted in 2009 the Resolution on the “Law of Transboundary Aquifers” (Resolution 63/124), based on the works of the International Law Commission and UNESCO’S IHP/ISARM programs. It encourages States to adopt agreements regarding principles (like equitable and reasonable utilization, sovereignty of the States, the obligation not to cause

significant harm, obligation to cooperate) and the need to take measures for the protection and management of the aquifers. The four countries of Mercosur signed a treaty on the Guarani Aquifer, in August the 2nd 2010, which contemplates some of the provisions elaborated by the UN Commission on International Law. A comparison between the two documents gives in-puts to understand what the abstract UN Text gives as a Standard and what Argentina, Brazil, Paraguay and Uruguay assumed as effective compromises.

In the preamble of the two documents appear the first differences. Both texts assert the importance of cooperation; they reaffirm the resolution on permanent sovereignty over natural resources (Resolution AG/UN 1803 of 1962); and the principles enshrined in the Rio Declaration (1992). But there is no express quotation of UN GA Resolution when it recognizes, e.g.: the increasing demands for freshwater and the need to protect groundwater resources; the need to ensure the development, utilization, conservation, management and protection of groundwater in the context of sustainable development; the need to take into account the special situation of developing countries. The Agreement on the Guarani, on the other hand, apart from the considerations already mentioned, recalls the statements of Stockholm (1972) and Johannesburg (2002); notes the progress made on the harmonious development of water resources and physical integration, according to the Plata Basin Treaty (1969); notes the Mercosur's Framework Agreement on the Environment and the desire of States to expand the levels of cooperation to a higher scientific knowledge of the Guarani Aquifer System and responsible management of water resources.

Other differences between the Guarani Agreement and the UN Resolution should be mentioned. For the UN General Assembly, an aquifer is a geological formation that contains water; the use of the aquifer means the extraction of water, heat and minerals, as well as storage and disposal of any substance. A system of aquifers in this context is a series of two or more aquifers hydrologically connected. For the countries of Mercosur, the definition of the Guarani Aquifer System is different: the Guarani Aquifer System is a transboundary water resource that integrates the sovereign territorial area of Argentina, Brazil, Paraguay and Uruguay (art. 1). To make clearer what's the "sovereign domain" of each State, art. 2 provides that each State "shall exercise the sovereign territorial domain over their respective portions of the Guarani Aquifer System in accordance with its constitutional and legal dispositions and in compliance with international law." While the UN Resolution uses the notion of the aquifer as a geological formation containing water (thus, admitting the exercise of sovereignty over portion of the aquifer), the Agreement on the Guarani define the aquifer as a "transboundary water resource", i.e.: something that by its characteristic of fluidity cannot be submitted to territorial sovereignty, although the assertion of sovereignty seems to be the main objective of the Agreement. This means that the Agreement looks for a formula in which only the States concerned will be able to deal with these waters and its users, on the basis of normal traditional rights of the four covenant States.

The UN Resolution on the Law of Transboundary Aquifers establishes six principles: sovereignty of aquifer States; equitable and reasonable utilization (as well as relevant issues to determine what is equitable and reasonable, including the basic human needs); obligation not to cause significant harm to another State; obligation to cooperate; and an obligation to promote a regular exchange of information. At last, the Resolution encourages States to adopt regional or bilateral agreements, which Brazil, Argentina, Paraguay and Uruguay just did.

Four principles were established by the Agreement on the Guarani Aquifer: sovereignty (art. 2); "sovereign right to promote the management, monitoring and sustainable use of water resources of the Guarani Aquifer System", on the basis of "criteria for rational and sustainable use and respecting the obligation not to cause appreciable harm to other parties or the environment" (art. 3); duty of protection and preservation of the Guarani Aquifer System "in order to ensure the multiple, rational, sustainable and equitable use of water resources" (art. 4); compliance of International Law Rules and adoption of measures to avoid damage to other Parties or to the environment, when activities or

studies related to the aquifer are undertaken (arts. 5 and 6). It's therefore established that management, monitoring and sustainable exploitation of the aquifer are rights of the States; though the Agreement emphasizes the obligation not to cause sensitive damage too.

The Resolution on the Law of the Transboundary Aquifers establishes 5 obligations related to the protection and conservations of aquifers or an aquifer system. They are: the duty to adopt measures to protect and preserve the ecosystems within a transboundary aquifer or his dependent; duty to identify and protect recharge and discharge zones of an aquifer; duty to prevent, reduce and control pollution, adopting a precautionary approach; and the duty to monitor the aquifer, if possible jointly with other aquifer States concerned; the duty to establish and implement plans for the proper management of the aquifer and to establish mechanisms for joint management (art. 10-14). The States of Mercosur made an agreement on promoting the protection and preservation of the Guarani Aquifer System to ensure the multiple, rational, sustainable and equitable use of water resources (according to art. 4 of the Treaty on the Guarani). They also set their commitment to cooperate for technical and scientific knowledge; cooperate to exchange information about the aquifer and on management practices, possibly to promote "joint projects" (art. 12) - without prejudice to the projects each State wishes to engage in its own territory (art. 13) -; and also cooperate in identifying critical areas that require specific treatment (art. 14). A committee will be created, within the framework of the La Plata Treaty, and will be in charge of the coordination of cooperation between the States (art. 15). These provisions mean an advance, because nothing like this existed in the regional context. Now the four States are committed to cooperate for various purposes and obliged to ensure sustainable, rational and equitable use of water resources.

Finally, procedures for “planned activities” are mentioned in both documents. The Guarani Agreement establishes that a State shall inform the others about activities that may have an effect on the Guarani Aquifer System, or beyond its borders (art. 9), along with technical studies available. If a State considers that an activity undertaken by another Party may cause harm, it has the right to request information (art. 10, 1). If the notified State concludes that it might suffer harm as a result of an activity authorized or undertaken by another State, both Parties must negotiate in good faith to achieve the most equitable solution possible. According to art. 11 of the Guarani Agreement, if the notified State offer strong evidences that harm will be caused, the planed activity must be suspended and cannot be initiated or continued during the negotiations, which should be completed within six months (art. 11). If the dispute persists, it should be settled through direct negotiation or consultation with the Commission [to be created], which will have 60 days to make recommendations (art. 16-18). In case of failure of these proceedings, the States shall appeal to arbitrage; the Agreement says that the procedure of arbitrage will be set in the Additional Protocol to the Agreement (art. 19). On this point, the Mercosur Agreement on the Guarani Aquifer is more detailed than UN Resolution on the Law of Transboundary Aquifers. The procedure for planned activities of art. 15 of the UN/AG Resolution is very similar, but it doesn't specify delays for negotiations, nor the possibility of suspending the activity during the procedure. The States proceed to consultations or negotiations and they may use an independent fact-finding body to make an impartial assessment of the effect of the planned activity.

5. CONCLUSIONS

It has been said that Brazil is a wealthy freshwater resources country. The Brazilian State is begging to deal with water issues, trying to deploy the best management practices recommended. The Constitution of 1988 was very important in this field, because it divided clearly the domain and jurisdiction within the Federation. In 1997 was enacted the Law 9433 that created the National Policy for Water Resources and the Water Management National System, with valuable principles, goals and instruments. But it's not immune to criticism: the integrated management of surface and groundwater was not predicted and the institutions of the management system had to develop a framework for that; and the public participation on the decision making process is only implemented as the river basin committees are created. The biggest problem seems to be the fact that the federal government and the

States of the Federation are fighting over the control of some groundwater reservoirs, even though the Constitution is very clear on that matter.

On the regional level, Brazil and its neighbours made progress on regulating transboundary groundwater. The Agreement on the Guarani Aquifer, signed in San Juan (Argentina) on August the 2nd, 2010, contains provisions never seen before. First of all, the main concern is to proclaim the sovereignty over the Guarani or, in other words, tell the rest of the world who owns the aquifer. Besides that, Argentina, Brazil, Paraguay and Uruguay agree on the need to assure the sustainable use of the aquifer, as well as to avoid activities that could harm another State or the environment. This provision goes further than the UN Resolution on the Law of Transboundary Aquifers, which establishes the obligation not cause damage to another State, but doesn't mention the environment. It is worth to mention also that the articles on planned activities and the procedure created by the Agreement on the Guarani is a huge advance for the relationship of the four States. They are also obliged to cooperate to various purposes, including joint projects, and to exchange technical and scientific information on the aquifer. Even though there aren't provisions specific on pollution, discharge and recharge zones – as the UN/GA Resolution recommended - the Agreement mentions the duties to promote the conservancy and protection of the Guarani Aquifer System, to exchange data and information, to identify critical zones that demand special treatment, and to use water on a sustainable and rational way. It seems that an important step was taken.

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