

Groundwater: Agreement on the Guarani Aquifer

The enactment of Federal Decree No. 11,893, of January 23, 2024 operated the promulgation of the Agreement on the Guarani Aquifer, which was signed in San Juan, on August 2nd, 2010, among Brazil, Argentina, Paraguay and Uruguay (each one referred to as a “Party” or, jointly, as the “Parties”), on August 2nd, 2010. In the international sphere, the Agreement was already in force since November 26, 2020, but it was through its promulgation that it became enforceable at national level in Brazil.

The Guarani Aquifer is considered one of the largest natural groundwater reservoirs of the world and consists of a **very heterogeneous system of aquifers** (the Guarani Aquifer System, or “SAG”) that are largely confined underground by basaltic rocks and sediments of low permeability. The SAG occupies a total area of approximately 1,195,200 sq. km, with an estimated volume of 46,000 km³ of water. Inside the Brazilian territory are almost 2/3 (71%) of the whole Guarani Aquifer, which extends itself through three regions (Center-West, Southeast and South), encompassing eight states: Mato Grosso do Sul (213,200 sq. km), Rio Grande do Sul (157,600 sq. km), São Paulo 155,800 sq. km), Paraná (131,300 sq. km), Goiás (55,000 sq. km), Minas Gerais (51,300 sq. km), Santa Catarina (49,200 sq. km) and Mato Grosso (26,400 sq. km). In Argentina, it encompasses an area of approximately 225,300 sq. km (19% of the total area), in Paraguay, 71,700 sq. km (6%), and in Uruguay, 58,400 sq. km (4%).

The water stored in the SAG has excellent natural quality and has been used not only for domestic consumption (main use), but also, at increasing rate, for industrial and agriculture purposes. However, such as it happens with groundwater in general, particularly when it is confined, it is extremely vulnerable to pollution – notably associated with the release of domestic and industrial effluents without proper treatment and with the contamination by agrochemicals in areas of surface outcrop – and to overexploitation (when the extraction is higher than the natural recharge capacity). Another problem that threatens the aquifers in general, including the SAG, consist of the inadequate occupation of recharge areas, with the destruction of soil-protective vegetation and its impermeabilization.

The Agreement qualifies the SAG as a **transboundary water resource** that is held by the four countries where it is located, which perform their sovereign territorial domain over their respective portions.

With the purpose to coordinate the cooperation among the Parties for the compliance with the Guarani Aquifer Agreement, a Commission integrated by the four Parties to the Agreement has been instituted in the context of the Treaty of La Plata River Basin (1969).

In Brazil, one of the greatest challenges for an integrated management of the SAG resides in the fact that the public management of groundwater – including the issuance of **authorizations to the use of water resources** involving the **extraction of groundwater** – is based on the sphere of state authority, pursuant to the provisions of the Brazilian Constitution. ■

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Pursuant to the Agreement, the Parties will promote the conservation and environmental protection of the SAG in such a way to ensure the **multiple, rational, sustainable and equitable use** of its water resources. As a consequence of such provision, when the Parties perform **activities or works involving the use and exploitation of**

water from the SAG in their respective territories, they shall adopt “all measures necessary to avoid the causation of sensitive damages to other Parties or to the environment”.

The Agreement also establishes that whenever a Party intends to implement or authorize an activity or work in its territory contemplating the use of water resources from the SAG and that may have **effects on the SAG beyond its borders**, such Party shall inform the others. Such information shall be accompanied by technical data, including the results of an **assessment of the respective environmental impacts**. When another Party indicates that such activity or work may cause a sensitive damage against it, such activity or work shall not be implemented or have its implementation authorized for as long as the consultations and negotiations between the Parties persist to seek an equitable solution, which shall be concluded in the maximum deadline of six months.

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