

Gonzalo Hatch Kuri*

Challenges for Mexico-U.S. Transboundary Aquifer Management

One constant in the debate about water is the existence of two practically irreconcilable political positions. One, influenced by the principles laid out at the 1992 Dublin Conference, defends the intervention of the market in water management; the other defends water as a common good. Both positions suffer from complete inattention to the formulation of concrete policies for transboundary aquifer management. Thus, approaching and studying transborder groundwater require an analysis that weaves together three dimensions: the scientific, the technical, and the political. The specialized literature examines these three in a fragmented way.

The study, identification, and assessment of these aquifers are recent. Specialists like Alfonso Rivera point out that 60 percent of surface and underground fresh water deposits cross some international boundary, and that only 40 percent of international basins come under the aegis of some kind of accord about the political distribution of shared water.¹ Transboundary aquifer management is becoming a priority on the international agenda. This can be seen in many documents, like “The 2030 Agenda for Sustainable Development” and the “17 Sustainable Development Goals.” Goal number 6 states that “availability and sustainable management of water and sanitation for all” must be ensured, while Section 6.5 stipulates that by the year 2030, integrated water resources management must be implemented on all levels, including transboundary cooperation. In accordance with this, the UNESCO International Hydrological Program’s eighth phase, “Water

Security, Addressing Local, Regional, and Global Challenges (2014-2021),” fosters scientific research on six key themes, the second of which makes comprehensive management of transboundary aquifers a priority.

In procedural terms, in 2015, the International Groundwater Resource Assessment Centre (IGRAC) and the UNESCO identified 21 transboundary aquifers in North America. Of these, 10 were situated along the Canadian-U.S. border (Abbotsford-Sumas, Okanagan-Osoyoos, Grand Forks, Poplar, Estevan, Northern Great Plains, Châteauguay, Judith River, Milk River, and Richelieu/Lake Champlain), and 11 on the Mexico-U.S. border (San Diego-Tijuana, the Lower Colorado River Basin, Sonoyta-Pápagos, Nogales, Santa Cruz, San Pedro, Conejos Médanos/Bolsón de la Mesilla, Bolsón del Hueco, Edwards-Trinity-El Burro, Río Bravo/Grande Lower Basin, and Los Mimbres-Palmas). At least one-third of these shared aquifers have already been assessed, and, in some cases, protocols have been developed for their joint management.

In accordance with this, in 2016, the United States concluded the Transboundary Aquifer Assessment Program (TAAP) for four aquifers shared with Mexico (Santa Cruz, San Pedro, Conejos Médanos/Bolsón de la Mesilla, and Bolsón del Hueco). Even though both nations worked

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* UNAM Postdoctoral Fellowship Program fellow at the CISAN; ghatch@comunidad.unam.mx.

very hard on this and they share a mutual interest in a scientific understanding of these water reserves, the results of the study still display significant underlying legal, financial, and institutional asymmetries with regard to groundwater management in the two countries.

Transboundary Water Treaties In North America

In the case of the Canadian-U.S. border, many bilateral agreements exist to manage shared water. It should even be pointed out that subnational border governments from the two countries have promoted, signed, and recognized *ad hoc* arrangements. Two of the most important are the 1909 Boundary Water Treaty U.S.-Canada and the 1978 Agreement between Canada and the United States of America on Great Lakes Water Quality, which came into effect in 2013. Both accords establish the mechanisms needed to surveil, preserve, and maintain optimum quality of the shared water bodies, such as the Great Lakes. The International Joint Commission merits special mention, arising out of the multiple treaties about transboundary water signed by these countries in 1909, 1950, 1961, 1964, and 1984.

The “Report on Interior, Border, and Transboundary Water Management in North America” (2001) recognizes the importance of aquifers as reservoirs. The International Joint Commission has had considerable influence on its management in Canada and the United States in three operational areas: supervision of apportionment, level management, and supervision of the quality of transboundary water. One example was the Milk River Aquifer Reclamation and Conservation program implemented by the Canadian government to protect and conserve the water in the Milk River Aquifer in order to mitigate the effects of fracking in the state of Montana.²

In the case of the Mexico-U.S. border, the 1944 Water Treaty is the only reference point for the political division of the three main shared bodies of water: the Río Bravo/Rio Grande, the Colorado River, and the Tijuana River Basins. Although it does not cover transboundary groundwater, this treaty has been the basis for the still-pending formulation of a general agreement in this field, according to Minute 242 (1973) of the International Boundary and Water Commission, dealing with a problem of contamination of groundwater in the area near where the Colorado River crosses into Mexico. Despite this, both governments have collaborated to jointly identify and assess some of the transboundary aquifers. An important part of those



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efforts includes the creation of both the Bolsón del Hueco Transboundary Binational Data Base in 1998 and the Binational Program to Monitor Groundwater in the Arroyo Los Nogales Alluvial Aquifer in 2001. The last program for carrying out a binational assessment was the TAAP.

Despite political, scientific, and technical-procedural efforts in managing transboundary aquifers in North America, political, legal, institutional, and financial asymmetries exist between Mexico and the United States in dealing fundamentally with the issue and achieving much more effective agreements than in the case of Canada and the United States.

Asymmetries in Managing Mexico-U.S. Aquifers

One of the main asymmetries is linked to the kind of sovereignty that each country exercises over transboundary groundwater. First of all, it is necessary to recognize that this water is a shared international watercourse, as suggested by different specialists and some international guidelines developed for this purpose.³⁴ This means that both countries should exercise limited territorial sovereignty over the transboundary groundwater; however, the legal regulatory framework makes that impossible.

In the United States, groundwater management comes under the jurisdiction of that country's subnational entities, each of which exercises sovereignty over its natural resources differently. By contrast, in Mexico, it is the federal executive branch that has jurisdiction; in this sense, the U.S. federal government is in practice not able to generate an agreement about groundwater since it does not exercise unlimited sovereignty over it. Something similar happens in Mexico because, although the Constitution stipulates that groundwater is the property of the nation, in reality, since it can be freely extracted, it falls under the private domain.⁵

In the financial sphere, Mexico's weak economic capabilities for dealing with the issue—in 2017, its National Water Commission's budget was slashed 72 percent vis-à-vis the previous year, and this is expected to be repeated in 2018—make these asymmetries an even greater obstacle. It should be remembered that the TAAP was assigned US\$50 million, although at the end of the day, only 10 percent of that was used; and California's Sus-

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tainable Groundwater Management Act, approved in 2014, was assigned US\$100 million for operations. Other elements that should be underlined include the lack of qualified staff in Mexico and the small number of schools that teach subjects involving transboundary groundwater.

Challenges for Correct Transboundary Aquifer Management

The TAAP had four specific objectives: developing and sharing data bases on the quality and quantity of groundwater; evaluating the accessibility and movement of the water and its interaction with surface water; developing and improving information on groundwater flow systems to facilitate an agreement and planning; and providing useful information to institutional decision-makers.⁶

The results of this program have already been published and are open access. Particularly important among them is the most recent publication of the "San Pedro River Aquifer Binational Report,"⁷ which includes its hydrogeological assessment and updated theoretical model. All together, these reports show substantial advances in the creation of data bases and critical indicators for groundwater. Therefore, in the light of these reports, we can consider the TAAP an important precedent in the matter, not only because of the quantity of financial, technical, institutional, and human resources utilized, but also because of the abundant information it produced. Nevertheless, the lack of specific public policies about aquifers is a matter for concern, since the General Accord on Binational Coordination signed by both governments tacitly agreed not to deal with issues of water rights or binational aquifer management.

While the TAAP created the foundations for a much more effective assessment of the aquifers studied, aspects like the different kinds of water rights (concessions, inheritance, private land with water rights, among others) and their management were left out. The matter practically centered on a technical, engineering logic, which,

without underestimating its results, disregarded the political dimension of the process of cooperation. In addition, the TAAAP, characterized by having huge financial resources and numerous staff, put Mexico at the disadvantage in transboundary groundwater management. Undoubtedly, the underlying political meaning was to have a much more realistic understanding of the kind and amount of the main hydric reservoir located on both sides of the border. This undoubtedly will strengthen the U.S. construction of water security, understood as the capacity of a population or country to ensure sustainable access to quality water acceptable for socioeconomic development, guaranteeing protection against contamination and preserving ecosystems in a climate of peace and political stability, in accordance with the UN Water Program definition of 2013. Along these same lines, recent studies on the initial cartography of all the shared transboundary aquifers of both countries reiterate U.S. political interest in this issue.

Conclusions

The treaties currently in force on the political distribution of transboundary water in North America are the product of huge cooperation efforts during the twentieth century, although they almost all involve surface water, that is, hydrological basins. In the history of the issues dealt with in the complex Mexico-U.S. bilateral relationship, the twentieth century is marked by the negotiation and entry into force of the 1944 Water Treaty, which establishes the political distribution of the three shared basins. The United States displayed greater interest in the issue given the importance of the use and supply of transboundary groundwater because Mexico's northern border is one of the geographic spaces with the highest levels of economic integration and where water plays a preponderant role. However, the bilateral Mexico-U.S. ne-

gotiation has by no means been free of polemics and outright differences in the interests underlying the way these international waters are managed.

Undoubtedly, in this century, the political dimension of groundwater will be reassessed not only in North America, but the world over due to the growing dependence on it. Therefore, transboundary groundwater will surely occupy an important place on international agendas. But it will probably not be the object of general treaties or accords since, as has been pointed out here, the kind of sovereignty that can be exercised over these waters is to regulate them, and even this is severely impeded for the moment in dealing with the issue.

Although the binding international instruments mentioned here call on their signatories to come to peaceful agreements with regard to their shared water, neither Mexico nor the United States have ratified them. In this area, Resolution 63/124, "The Law of Transboundary Aquifers," can be an excellent guide for the two countries to come to much more profound bilateral arrangements. The aim could even be to negotiate about the current 1944 Water Treaty to insert a plan for binational management of transboundary aquifers. ■■■

Notes

1 Alfonso Rivera, "Transboundary aquifers along the Canada-USA border: Science, policy and social issues," *Journal of Hydrology: Regional Studies* vol. 4, 2015, pp. 623-643.

2 Jeff Printz, "Milk River Aquifer Reclamation & Conservation Program 1999-2004. Summary Report, Agriculture and AgriFood Canada-Prairie Farm Rehabilitation Administration, Medicine Hat Alberta, April 2004, p. 229, http://40mile.ca/wp-content/uploads/2010/04/milkrivaqsumreportApr_2004.pdf.

3 Nadia Sánchez, "Differentiating between Sovereignty over Exclusive and Shared Resources in the Light of Future Discussions on the Law of Transboundary Aquifers," *Review of European Community and International Environmental Law* vol. 24, year 1 (2015), pp. 4-15.

4 UNESCO Office Montevideo and Regional Bureau for Science in Latin America and the Caribbean [438], OAS. Dept of Sustainable Development, "Estrategia Regional para la Evaluación y Gestión de los Sistemas Acuiferos Transfronterizos en las Américas," 2015, Montevideo, <https://unesdoc.unesco.org/ark:/48223/pf0000235394>.

5 The author suggests reading Article 27, paragraph 5 of Mexico's Constitution at <http://www.ordenjuridico.gob.mx/Constitucion/articulos/27.pdf>.

6 William M. Alley, ed., "Five-Year Interim Report of the United States-Mexico Transboundary Aquifer Assessment Program: 2007-2012," U.S. Department of the Interior/U.S. Geological Survey (Reston, Virginia: 2013), <https://pubs.usgs.gov/of/2013/1059/pdf/ofr2013-1059.pdf>.

7 James Callegary et al., "San Pedro River Aquifer Binational Report," Arizona, International and Boundary Water Commission (2016), <https://wrrc.arizona.edu/san-pedro-aquifer-binational-report>.

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