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## Managing an endangered river across the USA-Mexico border

To overcome pressures on water quantity and quality in the Rio Grande/Bravo the 1944 Water Treaty between Mexico and the USA must be adapted, taking full advantage of the institutional flexibility to include environmental sustainability.

### Summary

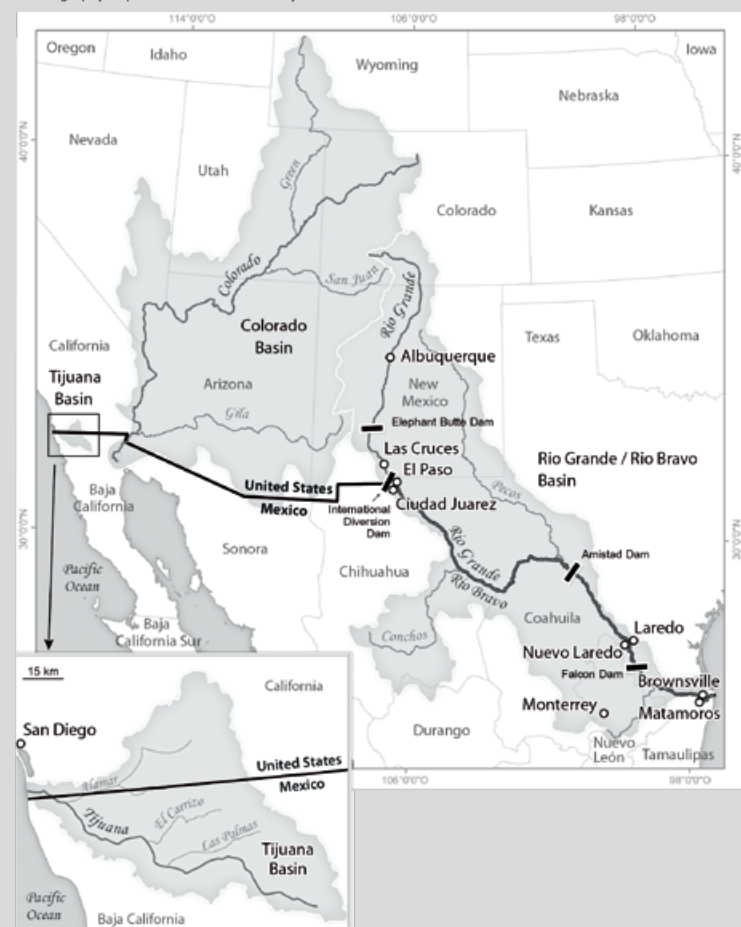
- The Rio Grande/Bravo is a lifeline to the desert in northern Mexico and southwest USA, and forms the boundary between the USA and Mexico for 2,034 km. However, it suffers from both low rainfall and a high level of pollution, leading to low water quantity and quality.
- The 1944 Water Treaty, which encompasses the river, does not currently include any provision for environmental sustainability. However, the institutional flexibility is available to adapt the treaty via the 'minute' system. Minutes form extensions of the treaty and can be used to address extant and emerging issues.
- Research into the views of water managers, farmers, engineers, academics, and representatives of environmental groups showed that a large proportion of these stakeholders were concerned that there was no sustainability provision in the treaty to ensure enough water for river ecosystems.
- We recommend that the International Boundary and Water Commission (IBWC), as the relevant institutional body, authorize studies on the water flow required to maintain the function and resilience of the aquatic ecosystems which provide goods and services to society.
- The IBWC should also create an exploratory water taskforce to gather valuable insights from stakeholders, and encourage engagement with the process.
- Once these two steps have been taken, the IBWC should provide clear recommendations to the US and Mexican governments that will improve water management in the region.
- The minute system can then be effectively used to adapt the scope of the 1944 Water Treaty in the face of pressing current problems and future challenges.

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The US and Mexican transboundary rivers, showing the course of the Rio Grande/Bravo.

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## Introduction

A total of 145 nations, accounting for more than 90% of the world's population, include part of a river basin that is shared between countries, and 21 countries lie entirely within such international basins. Effective management of the water that flows through these river systems is vital to ensure equity between individuals of different nationality, as well as to protect riverine ecosystems and the services they provide.

The Rio Grande, as it is known in the USA, or the Río Bravo, as it is called in Mexico, is the lifeline to an expansive desert in northern Mexico and southwest USA. From Colorado to the Gulf of Mexico, over 3,000 km, people depend on the river to quench their thirst and irrigate their crops. The river also forms the boundary between the USA and Mexico for 2,034 km.

The river basin—which covers an area of 924,300 km<sup>2</sup> and is divided almost exactly in half between the two countries—is characterized by low rainfall and a high level of pollution. This has led to reductions in both water quantity and quality, twin problems that are further exacerbated by population growth.

Negotiating policy solutions to these problems is difficult but not impossible, and this brief provides some guidance and suggestions for how progress can be made.

## The treaty

The 1944 Water Treaty between the USA and Mexico aims to share the water resources of the river equitably between the two countries. However, it was drawn up in a time when water resources were plentiful in relation to the population, and the environment was not yet something that policymakers considered. As a result there is no clause relating to sustainable development.

Despite this shortfall, the treaty does allow for adaption to new conditions, through the use of extensions to the treaty known as "minutes." Each minute is a unique agreement based on the identification of a problem along the USA-Mexico border, and is approved by the two governments.

For such minutes to be enacted, the International Boundary and Water Commission, which presides over the shared water

resources of the river, must commission studies or reviews of the problem in question. Once the results have been returned, the commission will seek feedback from stakeholders, and draft recommendations for the treaty extension. In what can be a long process, these drafts will be sent back and forth in English and Spanish to the US and Mexican sections of the commission before finally being submitted for approval to the US Department of State and the Mexican Ministry of Foreign Relations. Once approved, the extension minute becomes a binding agreement in the treaty between the two countries.



Agriculture in the Rio Grande/Bravo basin is under increasing threat from water shortages.

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## The importance of stakeholders

“Stakeholders” in the case of the Rio Grande/Bravo are an extremely diverse group, encompassing local people, research institutions, non-governmental organizations such as wildlife charities, and government departments from both countries. It is vital that these diverse voices are heard so that all types of knowledge and worldviews can be incorporated; stakeholder involvement also ultimately increases the chances of success of implementation of any agreement between the two nations.

Seeking to understand stakeholder views, IIASA researchers interviewed 77 individuals including water managers, farmers, water engineers, academics, and representatives of environmental groups. The results showed that most interviewees were concerned that there was no sustainability provision in the treaty to ensure enough water for river ecosystems. There was also frustration that, despite a clear way to extend the treaty through the minutes system, there had not yet been enough political will to do so.

They also agreed on the need to strengthen communication among all stakeholders and related water agencies; provide environmental education; manage surface and groundwater jointly; and renew all water agreements in view of the imbalances between supply and demand. Based on the perspectives gathered through the interviews, IIASA researchers propose four policy recommendations that could help strengthen water management in the region:

1. Allow for reciprocal and temporary water re-distribution, meaning that during times of drought, water could be moved from one purpose to another. For example during a drought it might make economic sense for a farmer to transfer their water to another use, like city or municipal use or fish farming. Such a scheme would allow them to temporarily transfer their water right to another willing user, who would give them back their water in times of water abundance.
2. Take better advantage of the many water experts in the region, and bring them together at the basin scale to facilitate exchange of best practices.
3. Formulate small-scale strategies to move towards sustainability across the basin. For example, this could mean, for the region above Elephant Butte Dam in New Mexico, strengthening efforts



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to restore native habitats and protect the forest. For the region between Elephant Butte Dam to El Paso, Texas it could mean removing sediments in the river and to bring it alive even during the non-irrigation season.

4. Use the minutes system to extend the Water Treaty to improve equitable sustainability.

## Working towards sustainable equity

As the stakeholders clearly identified, the minutes system of the treaty gives the institutional flexibility needed to ensure that sustainability is included as a key aim of water management. Furthermore, this system has already had success in improving the provision for equitable sustainability in the other two river basins which fall under the treaty. For the Colorado River, minutes have been successfully added to improve collaboration between the USA and Mexico and thereby minimize the impacts of potential water shortages. For the Tijuana River, minutes have been used to create stakeholder groups which address the issues of surface and groundwater use and environmental protection and restoration.

The International Boundary and Water Commission could draw on these successes and use a similar strategy for the Rio Grande/Bravo basin. Our first suggestion would be to create an exploratory water task force to gather and synthesise valuable insights from stakeholders. Alongside this, we suggest that more studies are needed to investigate the water flows required to maintain the functions and resilience of the aquatic ecosystems which provide goods and services to people within the specific context of the basin. Once these measures are in place, the commission would be in a strong position to provide clear recommendations to the US and Mexican governments which will improve water management in the region.



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This brief is based on the work by Postdoctoral Fellow Luzma Fabiola Nava (navajim@iiasa.ac.at) during her time at IIASA. Collaborators included researchers from Canada, the USA, and Austria: including researchers at New Mexico State University, the University of Vienna, Université Laval in Canada, Colorado State University, and the University of California, Davis.

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