

The Short- and Long-Term Ramifications of Linkages Involving Natural  
Resources: The U.S.-Mexico Transboundary Water Case

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## **Abstract**

Issue linkage is often recommended as a strategy to enhance cooperation. Lately it has been suggested that this strategy could also be applied to the management of transboundary natural resources. The present study examines the viability of this suggestion. It argues that in the case of natural resources such a linkage may have short- and long-term implications. Essentially, by constraining the options available to the various parties, such linkages limit the ability to adapt management regimes to changes in the environment. Thereby, they limit the ability to address environmental stresses and crisis. These negative implications may be redressed by mechanisms that will allow the parties to adapt the linkage to new conditions and by tactics that reduce the political cost of a linkage strategy. The study focuses on the negotiation process concerning U.S.-Mexico transboundary water, which was based on a long-term spatial linkage combining the waters of the Colorado River and those of the Rio Grande. This spatial linkage was advanced by a short-term issue linkage, in which the Mexican supported the establishment the United Nations in return for the U.S Federal Government's willingness to accept the spatial linkage. These linkages were found to have both short and long-term adverse implications. The short term implications were delays in negotiations, inconsistency in the legal doctrines held by the different parties during the negotiation and a threat to sovereignty. The main long-term implications identified is the current inability of Mexico to adapt the linkage in response to the ten years drought along the Rio Grande, as manifested in the inability of Mexico to meet its water obligations to the U.S. along the Rio Grande. This has resulted in a controversy between Mexico and the U.S. and between the Mexican federal government and the Mexican border states. It is suggested that flexibility provisions be included when linkages involving natural resources are advanced, so that the necessary adaptations in regimes management will be allowed for without necessitating a renegotiating of the treaty.

**Key words:** adaptive management; issue linkage; Rio Grande; transboundary water

## 1. Introduction

Although much of the theoretical work on negotiations presumes that two parties negotiate a single issue (Susskind, 1994), a few scholars have studied multi-party, multi-issue international negotiations and observed that multi-issue negotiations might have the potential to enhance cooperation by linking issues (Martin, 1994; Sebenius, 1983; Tollison and Willett, 1979; Bernheim and Whinston, 1986; Susskind, 1994; McGinnis, 1986). A number of studies at the national level observed the capacity of issue linkages (often called side payments or log-rolling) to overcome factional blocking (Mayer, 1992). Since states give different weight to different problems, issue linkages allows states to make concessions on issues they care little about in exchange for gains on matters that are of greater political or economic importance to them (Alt and Eichengreen, 1989; Sebenius, 1983; Tollison and Willett, 1979). As a result, linking issues can permit mutually advantageous deals not available on any single dimension (Martin, 1993). These create incentives for states to tie together issues that are not necessarily related in order to widen the possibilities for tradeoffs between issues.

The success of this strategy to enhance cooperation in international politics under conditions of self-interested behavior of separate actors has motivated scholars to advocate its use to settle conflicts concerning natural resources and especially transboundary common pool resources (e.g., Priscoli, 1990; Susskind, 1994; LeMaruand, 1977; Dutch Ministry of Housing, 1999, Weinthal, 2001; Sebenius, 1983; Wolf, 1997). It has been argued that since some of the parties may benefit from transboundary natural resources regimes while others may pay the cost of cooperation, linkages may help to offset this distribution effect, something that is essential for cooperation (LeMaruand, 1977). Indeed, treaties regarding natural resources, and particularly water often include issue linkages. This is evident in the Transboundary Freshwater Dispute Database, in which 43 percent of the treaties include linkages with non-water issues (Beach et al, 2000).

Linkages can also be made across different areas (thereafter referred to as spatial linkages) in order to enhance cooperation. This strategy may be beneficial where the natural resource is scarce in one place and abundant in another, a common situation with water resources (Frey, 1993). One such example is the formation of the Scheldt basin regime based on Holland and Belgium, linking water along the Scheldt with water along the Mass for over then twenty years (Meijerink, 1999). It is also possible to combine spatial linkages with issue linkages (hereafter referred to as combined linkages).

As natural resources management is a long term endeavor it is important to address the uniqueness of linkages involving (transboundary) natural resources. Transboundary natural resources are often regulated for a long period of time in order to secure the large capital investments needed for joint infrastructure and for preventing the defection of either side from the regime during a change in the background conditions. Thus, natural resources are regulated through treaties (Young et al, 1999; Susskind, 1994; Beach et al 2000) and institutions that establish a stable and reciprocal regime that is difficult to denounce (Elias, 1974) or even modify. As a result, natural resources management options are constrained for a long period.

Such long-term commitment can impair parties' ability to adapt to new conditions by modifying the linkages. This may have deleterious repercussions for the natural resources since the management of natural resources requires adaptation to changes in environmental background conditions (Ostrom, 1990). Consequently, when there are shifts in the conditions on which the agreement was predicated, the ability to maintain the linkages may be hampered,

thereby giving rise to a possible conflict. Moreover, natural resources often are considered as a local resource protected by local practices or by-laws, and hence owned and managed by local groups, states and basin riparians. Trans-basin and interstate linkages that redistribute the resources among users may increase the number of stakeholders and local riparians who incur costs, and so may have an incentive to oppose the agreement. In this case linkages may actually cause delays in reaching a negotiated agreement.

It may be difficult to maintain natural resource linkages over time due to the inherent uncertainty regarding natural resources and the subsequent need for adaptive management. However, these negative implications may be addressed by mechanisms that will allow the parties to adapt the linkage to new and unpredicted conditions and by tactics that will reduce the political cost of a linkage strategy.

To examine this hypothesis the paper focuses on the negotiation process between the U.S. and Mexico over their transboundary water. These negotiations were based on both spatial and issue linkages that had both short and long-term implications. The negotiations started at the beginning of the twentieth century and extended for over 40 years culminating in a treaty in 1944. The resulting regime is often cited as an example of cooperation in transboundary resource management and has been in place now close to 60 years (Mumme, 1993; Ingram and White, 1993). Thus, this case study provides a comprehensive record on the ramifications of negotiations that linked issues across river basins as well as the current long-term implications of such linkages.

The paper begins with a brief review of the history of the linkages between the basins along the U.S.-Mexico border and the linkage between the outstanding water issues and the establishment of the United Nations, which facilitated the 1944 agreement between the US and Mexico. These linkages had multiple ramifications, some immediate and some that became apparent only after a long while. In section three the short-term implications of the linkage strategy and some of the tools used to mitigate them are identified. Section four examines the long-term implications of this strategy by focusing on the current conflict between the U.S. and Mexico regarding the Mexican water debt to the U.S. A final section explores the relationship between specifics of this case and general features of natural resources.

## **2. The U.S.-Mexico Treaty: The Underlying Linkages**

Since the beginning of the twentieth century the U.S. and Mexico tried to regulate and divide the water along their two major transboundary basins: the Rio Grande/ Rio Bravo (hereafter called the Rio Grande) and the Colorado (Timm, 1941; Hundley, 1966). As these two basins are not hydrologically related (fig.1.), their waters were negotiated separately. By 1908 a commission for regulating the Colorado had already been established, followed a year later by a commission for the Rio Grande (Timm, 1941). However, as Mexico observed that its disadvantageous position as a lower riparian on the Colorado could limit the amount of water the U.S. would release on the Colorado River, the Mexican government demanded in 1925 that the negotiations be expanded to include both basins (Saenz, 1925; Sheffield, 1926). When citizens from San Diego (which is within the Tijuana basin) realized that there may be future discussions on the Rio Grande and the Colorado, they asked to include also the Tijuana River in the negotiations, as they feared that Mexico had plans to develop the Tijuana River in order to sell water to San Diego (Swing, 1926).

The Mexican suggestion to advance a spatial linkage between the Rio Grande and the Colorado basins was intended to promote a tradeoff in which Mexico would provide the U.S. with additional Rio Grande water in return for more water being provided by the U.S. to

Mexico on the Colorado (Bustamante, 2001). Moreover, the tradeoff had additional benefits for both sides. For the U.S. federal government it offered a comprehensive solution to all the transboundary water, which was seen as essential for manifesting its Good Neighbor Policy (Hundley, 1966, p. 79). This linkage had ramifications also for domestic politics in the U.S. as Texas stood to benefit the most from a Rio Grande settlement and thus could be counted on to support such a linkage and Mexican demands along the Colorado (Meyers, 1967, p. 547).

**(Fig.1. about here)**

As the Mexicans expected, Texas did in fact convince the U.S. State Department that a linkage might be beneficial for both federal governments (Enriquez, 1975, p. 493; Mumme, 1982, p. 85). Consequently, in 1926, the U.S. agreed to negotiate the three basins on an integrated basis (Sheffield, 1926). Soon after a single commission (the International Boundary Commission (IBC) was assigned to promote the negotiations over the three basins established by the spatial linkage. Although issues related to the three basins were negotiated together from 1927, only in 1944 did Mexico and the US reach an agreement for dividing the U.S.-Mexico transboundary water. The breakthrough in negotiation was a result of another issue linkage. Mexico agreed to support the U.S. efforts to establish the United Nations in return for the readiness of the U.S. federal government to accept the Mexican suggestion for a package deal to resolve all transboundary water issues (Rogers, 1964, p 125). This established a combined linkage, where the trans-basin spatial linkage was prompted by a linkage to another issue.

The final agreement (known as the 1944 Treaty) was based on a water tradeoff: Mexico would exchange annually 350,000 acre-feet of Rio Grande's water for 1,500,000 acre-feet from the Colorado (Northcutt, 1946; Anonymous, 1945f; Gomez, 1945). It was this linkage and the subsequent tradeoff between the two basins that allowed the 1944 Treaty to be signed between the US and Mexico (Fischhendler and Feitelson, 2003).

Since the agreement pertained to all three basins, a single commission was set up to administer it, called the International Boundary and Water Commission in English (IBWC) and Comision Internacional de Limites y Aguas in Spanish (CILA); this commission supplanted the International Boundary Commission which negotiated the treaty between 1935 and 1944. The IBWC/CILA included Mexican and American sections as component offices within the foreign affairs ministries of Mexico and the United States, respectively. The 1944 Treaty included a so-called "Minute" mechanism as a means for the two nations to agree to clarify the treaty to solve an issue, establish a policy, or authorize a capital project (Eaton and Hurlbut, 1992). Yet, many of the mechanisms to cope with events of climate uncertainty discussed in negotiations leading to the 1944 US/Mexico treaty were excluded as they were perceived to incur a high political cost<sup>1</sup> (Fischhendler, forthcoming).

### **3. Short-term implications of the linkage**

The spatial linkage had several immediate ramifications, noticed already during the negotiations process. These ramifications include delays in the negotiations and inconsistency in the legal doctrines both sides presented during the negotiations. The process also engendered domestic opposition within both Mexico and the U.S. on the basis of alleged threats to sovereignty from linked water resources. Due to the greater importance of the Rio Grande and the Colorado basins, and for sake of brevity, this paper does not address the linkage with the Tijuana basin; it is restricted therefore only to the implications of linkages between the Rio Grande and the Colorado basins.

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<sup>1</sup> . This includes a more stringent escape clauses that could have enhance the treaty flexibility to cope with a future change in the background environment conditions.

### *3.1 Delays in negotiations caused by the linkage*

Simultaneous talks on the Colorado and Rio Grande basins resulted in the U.S. and Mexico conditioning progress in negotiations on one basin on counter-progress on the other. This caused delays in the negotiations that perhaps may have been avoided had the two basins been discussed separately. Such delays were apparent already in 1925 when there was an option of advancing an agreement on the Colorado, as data had already been gathered on basin water use on both sides (Enriquez, 1975, p. 480-484). However, the agreement was delayed by Mexico's insistence on linking the Colorado negotiations to those of the Rio Grande basin, where there was further need to continue to collect data for a future agreement. The Mexican insistence on the linkage and the U.S. hesitation to accept this demand further postponed negotiations, which resumed only when the U.S. relented on this point (Hearing at the Foreign Affairs Committee, 1945, p. 31, referred hereafter as Hearing).

Another incident that demonstrates the delay effect took place in 1929-30 when the first round of negotiations started on an integrated basis. When Mexico sought to advance the principle of unity of the Colorado River<sup>2</sup>, the U.S. refused to acknowledge this principle; rather, it was willing to provide water as an act of friendship (Report of the American Section, 1930, p. 55, referred hereafter as RAS). Mexico, unable to get what it wanted on the Colorado, then refused to apply the same principle of unity on the Rio Grande and would not acknowledge how many, if any, Mexican tributaries would be allowed to reach the river (Hundley, 1966, p. 72). While the Mexicans conditioned progress on the Rio Grande upon counter-progress on the Colorado, the U.S. conditioned any progress on the Colorado upon counter-progress on the Rio Grande, insisting on the principle of prior appropriation of the Rio Grande. (Proceedings and debate of the 79<sup>th</sup> Congress pp. 2821, referred hereafter as Congressional Debate). Consequently, during the negotiations of 1929-30 no agreement was reached on either basin.

In 1942 again there was a partial understanding, this time concerning the Rio Grande, as the U.S. realized that although Mexico refused to transfer 1,000,000 acre-feet from its tributaries, the American side could still collect enough water from its own tributaries to irrigate the land being cultivated in Texas (Committee of Fourteen, 1942). Thus, only on the Colorado did major disagreement remain, but this hindered reaching a treaty on the Rio Grande (Hundley, 1966, p. 111).

This mutual dependency of the Rio Grande riparians on their Colorado counterparts motivated the former to push the latter to accept the treaty so as to avoid further delays in reaching an agreement on the Rio Grande (Hearing, p. 399). This resulted in Texas bonding with several Colorado basin states that supported the treaty to form the so-called Coalition of Six to lobby for the treaty on the federal level (Six States Committee, 1944).

It seems that the U.S. anticipated such delays during the course of the integrated negotiations. For example, already in 1925 when the Mexicans demanded a linkage strategy, the U.S. State Department argued that linking these two 'distinct' issues would cause delays (Hughes, 1925). Later, in 1938, similar concerns were raised again at a meeting in El Paso, Texas, between the Lower Rio Grande users and representatives of irrigation districts (Meeting, 1938). Often it was not only the Texans who felt that a linkage would delay an agreement on the Rio Grande, but also the Colorado states that were concerned about the same issue hampering agreement on

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<sup>2</sup>This river basin unity approach sees the whole basin as an integrated unit that must take into consideration any action of the upper riparian that may damage the interests of the lower riparians.

the Colorado, as reflected in the Congressional debates on the Boulder Canyon Power Project (House of Representatives, 1928). In both cases these delays allowed Mexico to increase its use of the Rio Grande's water and hence demand more water under the prior use doctrine. Despite foreseeing these delays, neither the US federal nor Texas governments wished to de-link the basins due to its ability to provide a comprehensive solution to the whole border water conflict

### *3. 2. Effect on legal doctrines*

Another effect of the linkage was its influence on the legal doctrines held by the different parties during the negotiation process. In 1922 the Mexicans established a committee (Junta de Agua Internacional) composed of representatives of the Ministry of Agriculture and the Ministry of Foreign Affairs to collect data and set policy for future negotiations of both basins. A controversy erupted within the committee over the legal tenets that should underlie the Mexican stand. The Ministry of Agriculture pushed for the principle of absolute sovereignty over the Rio Grande, while adopting the principle of unity of the river regarding the Colorado. In contrast the Ministry of Foreign Affairs advocated a unified legal doctrine for both basins, which meant adapting the principle of prior use (Enriquez, 1975, pp. 484, 496). The controversy was not resolved, but the Mexican government eventually adopted the Ministry of Agriculture position that called for two independent principles, one for each basin (Enriquez, 1975, 518; Hawkins, 1931). The consequences of upholding two contrasting doctrines at the same negotiations could be discerned throughout the 1929-30 negotiations. The Americans, for their part, argued for the principle of absolute sovereignty on the Colorado (Hundley, 1966, p. 74; Hawkins, 1931), but on the Rio Grande advocated the principle of prior use (RAS, pp. 6-9).

Both sides advanced in each basin the legal doctrine that best protected its interests, depending on their physical position in that basin. In other words, each nation advanced the doctrine of absolute sovereignty in the basin in which they were an upper riparian and unity of the river or prior use doctrine where they were lower riparian. By linking the two basins together, the inconsistency in legal arguments of both countries became untenable. This weakened, in particular, the Mexican position during the 1929-30 negotiations (Enriquez, 1975, pp. 517-518) and caused their failure in that round of negotiations, a fact acknowledged by the Mexican Ministry of Foreign Affairs and the U.S. section of the IBC (Enriquez, 1975, p. 497; Congressional Debate, p. 2821, respectively).

Mexico realized the need to align its legal position and eventually accepted the principle of present use and unity of the river with respect to both basins (Comisión Internacional de Límites y Aguas, undated, p. 74). Mexico's negotiators suspected that if they did not do so, the Americans would insist on the principle of absolute sovereignty on the Colorado, which would reduce the amount of water Mexico would obtain along the Colorado in comparison to the amount they eventually received in the 1944 treaty under the present use doctrine (Bustamante, 1999, p. 265). Subsequently, the U.S. also abandoned its earlier rigid adherence to the doctrine of territorial sovereignty on the Colorado (Mumme, 1982, p. 112).

### *3.3. Threat to sovereignty*

In both countries the proposed linkage raised strong domestic opposition on the basis that the linkage posed a threat to national sovereignty over water resources. Soon after the text of the treaty was released within Mexico to the public for the first time (April 20, 1945), it was realized that the treaty was based on a linkage. This was interpreted as relinquishment of a national natural resource, an act not permitted by the Mexican Constitution, which explicitly prohibits the alienation of either land or water under Mexican domination (Anonymous, 1945c; Northcutt, 1946). The opposition on constitutional grounds was led by the right-wing

opposition party, the Partido de Acción Nacional (PAN), which sought to make a national issue out of the Treaty (Mumme, 1982, p. 242) for electoral purposes (Bustamante, 1999, p. 258). The opponents to a treaty were joined by the Mexican states along the Rio Grande border, especially Chihuahua, from which most of the water to be delivered to the U.S. originates and which was thus to bear the heaviest burden of the tradeoff (Anonymous, 1945f; Bustamante, 1999, p. 262). Chihuahua residents were afraid that a tradeoff would limit the available water on the Rio Grande in the future. This, in turn, would limit potential Mexican development in the basin (Anonymous, 1945a; Anonymous, 1945b).

In response to opposition accusations, the government claimed that the treaty supplemented but did not violate the Mexican Constitution (Anonymous, 1945d; Anonymous, 1945e) and that Mexico would ensure that sufficient water would be available for the Mexican border states along the Rio Grande to develop agriculture even after release to the U.S. (Alba, 1945; Gomez, 1945; Padilla, 1945). In addition, the Mexican federal government launched an extensive campaign that focused on presenting the position of the Foreign Affairs and Agriculture Ministries to the media (Padilla, 1945; Gomez, 1945, respectively). Finally, the Mexican government's complete hegemony over the nation's water resources<sup>3</sup> and its centralized institutional structure enabled it to assign its own people to negotiate the treaty, thereby excluding the local pressure groups and neutralizing some of the treaty opposition (Enriquez, 1975, pp. 601-602). Consequently, Mexico was able to put national goals above those of any local pressure group (Mumme, 1982, p. 220) and advance the linkage strategy successfully. Nevertheless, the government's fear of trading natural resources that raise sovereignty issues led to an amendment of the Mexican Constitution in order to avoid contradiction between the Constitution and the treaty (Bustamante, 1999, p. 256).

Unlike the Mexican case, where the water sector was highly centralized, the U.S. control over water is shared between federal and state governments (Congressional Record, 1927). Hence, early in negotiations the attempt to establish a treaty based on a trans-basin water was interpreted by all the U.S. Colorado River Basin states as conflicting with the existing federal/state system and with local and basin water institutions. The prospect of a treaty motivated states perceiving that control over "their" water resources was threatened; they joined forces to object to the treaty and the proposed linkage (Anonymous, 1927). This opposition was manifest in the establishment of the Committee of Fourteen<sup>4</sup> and the Coalition of Colorado Governors and Commissioners. The aim of these coalitions was to protect the interests of the U.S. Colorado riparians against the U.S. State Department and Texas, both of which were suspected of a desire to promote linkage (Anonymous, 1927).

Since the State Department needed the support of the Committee of Fourteen in the treaty in order to ratify the agreement in the Senate (Colorado River Basin Committee, February, 1991), it had to convince the Colorado River basin states that it was in their best interests to support the treaty, despite the spatial linkage. These tactics included: arguments that large amounts of the water delivered to Mexico would originate from return flow (Hundley, 1966, pp. 90-91); that a delay in reaching an agreement would result in an extended Mexican claim, should the

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<sup>3</sup> The national hegemony originated from the 1917 Constitution, in which Article 27 states: "Ownership of the lands and waters within the boundaries of the national territory is vested originally in the Nation." For more on this matter, see Mumme (1982) and Tucker (1957).

<sup>4</sup> The Committee of Fourteen consisted of two members from each of the seven basin states. This committee met frequently, issued numerous reports and was highly involved in the negotiations as is elaborated upon in the next sections.



conflict go to arbitration<sup>5</sup> (Hundley, 1966, pp. 123-125); and an official denial of a tradeoff (Heany, 1945, p. 34). This denial was made despite the State Department's explicit desire for a tradeoff<sup>6</sup> and the Mexican admission that the water regime about to be established was based on a tradeoff (Anonymous, 1945f; Gomez, 1945). These arguments eventually led to a change in attitude of the upper Colorado states towards the treaty. Despite these arguments Nevada and California (which was about to incur a cost for cooperation with Mexico) continued to oppose the treaty on the basis that it: contravenes the Constitution (Hearing, p. 664); threatened their control over water resources (Hearing, p. 1162); and links two basins that are neither hydrologically nor geographically related (Hearing, p. 1791-1994). They demanded the removal of the linkage by the creation of two separate treaties, one for each basin (Hearing, p. 673), overseen by two different commissions (Hearing, p. 1791-1994). However, the State Department's strong support of the treaty and its ability to sway the upper Colorado states to support it, combined with the strong support of Texas, resulted in the U.S. Foreign Relations Committee and the Senate voting in favor of the treaty. Nevertheless, strong opposition to the linkage led to restricting the IBWC's jurisdiction to crossboundary water.

#### **4. Long-term implications of the linkage**

The linkage established in 1944 has left three managerial legacies for the current water relations between the U.S. and Mexico. The first is a legacy of a water tradeoff. The second is an administration of two basins within the framework of a single treaty. The third was the establishment of one institution to administer the treaty. It is argued here that these three legacies have created a long-term spatial linkage that impairs the flexibility to adapt the treaty and the linkage to the new environmental conditions, the result of which is a conflict. The current conflict between the two countries over the Mexican water debt on the Rio Grande provides a prism to examine the long-term implications of these legacies.

##### *4.1 The current water conflict along the Rio-Grande: A review*

The 1944 Treaty states that Mexico must deliver to the U.S. one-third of the flow of certain Rio Bravo tributary rivers reaching the main channel of the Rio Bravo, subject to the U.S. right to an average of at least an annual average minimum of 350,000 acre-feet per year (Article 4, 1944 Treaty). In case of 'extraordinary drought,' the treaty and its addendum (Minute 234) include an escape clause that enables Mexico to deliver less than this minimal amount of water in a five-year cycle, but requires it to make up the deficit over the subsequent five years (Article 4, paragraph B(d), 1944 Treaty and Minute 234). The vast majority of this water comes from the Conchos basin in the state of Chihuahua, the Mexican upstream border state along the lower Rio Grande (Kelly, 2001a). During the 1990s, due to a drought along the Rio Grande and the rapid development in the lower basin, Mexico was unable to meet its water obligations —by 1979 Mexico's water deficit was 1,023,849 acre feet (TCEQ, 2002); Mexico then asked the U.S. to invoke the 'extraordinary drought' stipulation. The U.S. agreed to enable Mexico to deliver the water during the next five-year cycle, starting in October 1997. Continued drought and ongoing development along the basin meant that by 2002 Mexico had accumulated a water deficit of approximately 1.5 million-acre feet (IBWC, 2002; TCEQ, 2002; or U.S. Department of State, 2003). The water not delivered has caused annual losses estimated at about \$978 million to the 28 Texas irrigation districts that are entirely dependent on this

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<sup>5</sup> This arbitration threat was based on an Inter-American Treaty signed in 1929 between the U.S. and Mexico in which the U.S. agreed that at Mexico's request it would arbitrate the question of the shared water of the Colorado River (Hearing, p. 257).

<sup>6</sup> For example, see a letter from the Undersecretary of State Sumner Welles to Mexican Ambassador Castillo Najera (Welles, 1939) and the U.S. National Resources Board's stand towards a tradeoff (U.S. National Resources Board Report, 1934).

transfer, based on an estimate by John Robinson at \$652 in loss per acre foot of water not delivered (Robinson, 2002). The frustration and losses of U.S. farmers has led them to pressure U.S. policy makers to seek an immediate solution to the crisis. Many meetings have been held between both IBWC sections and state representatives. There have been several discussions on the topic between U.S. President George Bush and Mexican President Vicente Fox (IBWC, 2002; Texas Department of Agriculture, 2003). The result of these meetings was Minute 307, which obliged Mexico to deliver 600,000 acre-feet of water by September 30, 2001 (IBWC, 2002). However, only some of this water (just over half) was transferred and the total deficit for April 2002 was 1,476,181 acre-feet of water, which is to be delivered by September 30, 2002 (IBWC, 2002). A recent agreement by Mexico to release 350,000 acre feet in 2003 is not perceived by analysts as a confirmation that it will either reduce the total deficit or even meet treaty expectations for the 2003 irrigation year, as some of the water will come from “conversion” from Mexican water already in binational reservoir storage, release from non-treaty sources<sup>7</sup>, and some potential releases are conditional<sup>8</sup> (U.S. Department of State, 2003).

#### *4.2 The current implications of the tradeoff*

Under the 1944 agreement the US uses more water along the lower Rio Grande than it contributes to it (Eaton and Hurlbut, 1992). This use pattern reflects an agreement concluded during a period characterized by a low level of development along the Rio Grande and high water flows. These conditions allowed irrigated agriculture to flourish along the Lower Rio Grande in Texas and yet enabled Mexico to further develop its agriculture on the lower Rio Grande, even after the implementation of the inter-basin tradeoff (Anonymous, 1945a; Alba, 1945; Gomez, 1945; Padilla, 1945). Water use for agriculture and urban use in Chihuahua has risen substantially in recent decades (Kelly, 2001b). This increase in demand in combination with the drought restricts Mexico’s ability to meet its obligations to the U.S. under the 1944 Treaty (Kelly, 2001a,b). As a result of the change in water availability since the historical obligation was signed, the Mexican border states along the Rio Grande attribute the ongoing Mexican water deficit to the historical tradeoff (e.g., Garcia, 2002; Anonymous, 2001). Yet these states disagree on the strategy required to resolve the conflict. Chihuahua, as the upper riparian that contributes most of the water delivered to the U.S., advocates a revision of the treaty. Its argument rests on the difference in background conditions (climatological, population, development) and resulting water needs today versus the status that served as a basis for the 1944 Treaty (Gonzalez, 2001). Due to these changes, Chihuahua argues that under today’s conditions the old linkage cannot be maintained, as it cannot keep on delivering water that benefit indirectly Sonora and Baja California (Tarango, 2001; Gonzalez, 2001).

Coahuila, Tamaulipas and Nuevo León (the lower Mexican Rio Grande riparian states that benefit from the water released by Chihuahua) are ambivalent towards Chihuahua’s call to revise the treaty. These states are willing to share the burden of water deliveries to the U.S. as long as the Mexican government financially compensates them. Their demand for compensation, like Chihuahua’s demand to renegotiate the treaty, is also based on the historical tradeoff which they interpreted as depriving them of their water to enable Baja California and Sonora to receive the U.S. water on the Colorado (Klerigan and Cázares, 2001; García, 2002). The Mexican National Water Commission acknowledges the adverse effect of the historical tradeoff, and as a result decided to consider financial compensation to the border states for the

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<sup>7</sup> This additional water will come from undesignated water in the 1944 Treaty

<sup>8</sup> About 50,000 acre feet could be released from the Rio Conchos Basin in Chihuahua only if climatic conditions permit (i.e. if enough rain falls in Mexico’s part of the catchment area).

water they indirectly gave to the Mexican states on the Colorado (Mlerigan, 2001). Indeed during the end of the year 2002 and during April 2003 the Mexican government issued compensation checks to Mexican irrigation districts along the Lower Rio Grande. These payments are in return to the water delivered to the US as part of the Mexican attempt to pay back its water debt to the US under the 1944 Treaty (Beshur, 2003). Moreover, 22 non-governmental organizations (NGOs) that remember the unique circumstances under which the 1944 Treaty took place (Binational Declaration, 2001) propose a solution to the conflict that is different from that of the border states. This solution is oriented towards adjusting the treaty to develop a drought management plan instead of renegotiating the treaty (Binational Deceleration, 2001; Kelly, 2001b; Contreras, 2001). This drought management plan is suggested to include reservoir management, agricultural conservation and stakeholders participation.

#### *4.3 The current implications of a single treaty*

A third legacy of the historical linkage is a single treaty that administers the two basins. This legacy limits the options to renegotiate the treaty because any effort to modify the treaty to the current conditions in one basin could affect the other basin. For example, the Mexican federal government, as opposed to Chihuahua, rejects the idea of renegotiating the treaty (Székely, 2001; Luévano, 2001). As stated by Jesús Luévano, Secretary of the IBWC's Mexican section (Luévano, 2001), this treaty established a 'package deal' in which all the crossboundary waters were linked under one contract (the 1944 Treaty). The Mexican section of the IBWC is aware that under such a 'package deal' negotiating the part of the treaty that deals with the water deliveries on the Rio Grande may affect water deliveries on the Colorado. It is especially concerned about California using the re-opening of the Rio Grande negotiations to reconsider issues that have been resolved concerning water deliveries along the Colorado. The Mexican government's concern is pertinent, since California is currently experiencing a water shortage that has seen it gradually shift to demand management (Zilberman, 2002) and to consider the adoption of new interim criteria<sup>9</sup> to meet the shortage (Bureau of Reclamation, 2000).

This concern motivated the Mexican Ministry of Foreign Affairs to summon to Mexico City representatives of all six border states along the two basins in 2001. The purpose of the meeting was to emphasize its view of the legal reality that one treaty had been designated to administer all the crossboundary water and that Chihuahua's demand to renegotiate the treaty should be viewed as a matter of concern to all border states. Sonora, Baja California and the federal government, it was explained, have no interest in jeopardizing U.S. water deliveries on the Colorado by renegotiating the 1944 Treaty pertaining to the Rio Grande (Luévano, 2001). The Mexican National Water Authority, like the Foreign Affairs Ministry, also rejected the call to renegotiate the treaty. It argued that regardless of the situation on the Rio Grande, the treaty still served the national goals by providing Mexico with water at a ratio of 4:1, meaning that Mexico received four times more water on the Colorado than it gave on the Rio Grande (Mlerigan, 2001)

The limited leeway the Mexican government has to renegotiate the treaty (due to its 'package deal' nature) motivated it to advance solutions to the conflict that would not endanger the Colorado water deliveries or U.S.-Mexico relations. One solution was Minute 307 mentioned above to deliver 600,000 acre-feet of water of water through its 50 per cent share of the water originating from undesignated inflows to the Rio Grande through (IBWC, 2002). Another was

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<sup>9</sup> It will establish more specific criteria for determining surplus conditions. This will give the lower Colorado states, including California, a greater degree of reliability of receiving surplus water supplies, while it reduces overall water demands on the Colorado River.

to provide some of this water through transfer of ownership over water from the two international reservoirs along the Rio Grande under the stipulations set in Minute 234 (IBWC, 2002). As a result, between October 1999 and September 2000, 300,000 acre-feet of water were delivered through these means (IBWC, 2002). In doing so, the Mexican government shifted the burden of the U.S. water payoffs from Chihuahua to the states of Coahuila, Tamaulipas and Nuevo León. These states, in turn, filed four lawsuits against the Mexican federal government to prevent water releases from what they perceive to be “their” reservoirs (Sattley, 2001a; Sattley, 2001b). Another government solution was to propose a drought escape clause that would enable Mexico to stop delivering water to the U.S. altogether in times of drought. This solution was advanced on the basis of reciprocity, since the U.S. had such a mechanism on the Colorado. Mexico suggested the mechanism be implemented by supplementing the existing treaty with a minute that does not endanger the existing treaty (Székely, 2001; Luévano, 2001). Mexico agreed to emergency water deliveries in return for North American Development Bank<sup>10</sup> (NADB) aid money to improve Mexico’s irrigation system along the Rio Grande (Pierson, 2002). The US may be hoping that the Mexican president can use the financial linkage (\$40 million in aid) to overcome opposition to debt repayment by the Mexican farmers suffering also from the drought (Gregor, 2002). As a result on June, 2002 Minute 308 was signed securing emergency water delivery of 90,000 acre feet of water and on July 3, 2003 Minute 309 was signed. This minute secure that about one third of the water saved as a result of the improved irrigation system financed by NADB money will be used to account for the Mexican water debt.

The legal framework of one treaty to administer the two basins has also affected the Texan position. Some local Texan players, such as most of the 28 irrigation districts along the lower Rio Grande (White, 2001; Hill, 2001) and other smaller users (Rubinstein, 2001), demand that the U.S. stop water deliveries on the Colorado. They base this demand on the linkage established by the treaty between the two basins. They maintain that the Mexican failure to fulfill its part of the treaty (by failure to repay its water debt on the Rio Grande) gives the U.S. just cause to stop its water deliveries on the Colorado (White, 2001; Hill, 2001).

This *quid pro quo* has received support not only among local Texan users but also from the two Texan senators (Kay Bailey Hutchison and Phil Gramm) and the Texas border districts congressmen (Henry Bonilla and Solomon Ortiz). These politicians recently submitted a Senate Congressional Resolution (Senate Congress Resolution 157) and a House Congressional Resolution (House Congress Resolution 440). These state that since the U.S. has never failed to deliver water on the Colorado while the Mexicans have failed to deliver their quota on the Rio Grande, the President of the United States should utilize his full power to bring about compliance with the 1944 Treaty. The Texas Commission on Environmental Quality has argued that the U.S. could terminate the 1944 treaty, withhold its performance with the 1944 Treaty, and insist on reparations in the form of immediate delivery of water from any source (TCEQ, 2002). Despite the Texan attempts to drag the Colorado basin into the conflict, the U.S. federal government is reluctant to escalate the conflict further (Ybarra, 2001).

#### *4.4 The implications of the linkage legacies in maintaining the existing treaty*

The legacies of the 1944 linkages affect the way water conflicts are managed in the maintenance of the 1944 Treaty. Yet, as described below, the three legacies act in different directions, some of which may strengthen the existing treaty while others unbalance it.

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<sup>10</sup> NADB was established as part of the North American Free Trade Agreement (NAFTA). Its aim is to help border border comunties build modern water and environmental infrastrucutre to provide safe drinking water, treat wastewater, and dispose of solid wastes. For more see Killgore and Eaton, 1995.

The first legacy of the linkage, the historical tradeoff of Colorado water for Rio Grande water, advanced the renegotiation of the treaty. As Chihuahua paid a cost of the tradeoff, it has an incentive to suggest treaty renegotiation in order to reduce the burden of water deliveries. This demand is strengthened by Texas, whose suggestion to withhold water along the Colorado further increases the likelihood of an escalation of the conflict, thereby endangering the treaty as a whole.

The demand to renegotiate the treaty is restricted by the second legacy, establishing one treaty for both basins. This legacy widens the number of stakeholders potentially involved in the conflict, thereby turning the conflict into a national issue that would reference renewed bilateral negotiations. As a result, the Mexican government, Baja California and Sonora have become involved more than they would, had no linkage between the basins threatened U.S. water deliveries to Mexico along the Colorado. The second legacy has also involved the U.S. government, the IBWC and the U.S. riparians along the Colorado in the conflict, as the issue of withholding the Colorado's water could affect the treaty as a whole (Ybarra, 2001) and could encourage Baja California to demand more water along the Colorado (Levy, 2001).

The third legacy, assigning one institution to both basins, protects the existing treaty. Assigning one commission over all crossboundary water means that one entity can identify the ramifications of any change in the linkage strategy. Thus the IBWC opposes any attempt to use to Colorado as a leverage to the Rio Grande conflict (Marin, 2001). This legacy also provides local users along the Rio Grande with a venue to demand withholding Colorado water, a situation perceived by many U.S. officials as a threat to U.S.-Mexican relations and to the treaty as a whole (e.g., Ybarra, 2001; Rascón, 2001). The Mexicans' fear that the IBWC will be exposed to pressures by local stakeholders to withhold water on the Colorado; as a result, the Mexican IBWC section rejected the participation of these local users in IBWC meetings (Rakestraw, 2001).

Regardless of the outcome of this conflict, it is clear that the historical linkages have enlarged the list of interested stakeholders who otherwise might not have been drawn in. These include Baja California, Sonora, the U.S. irrigation districts along the Colorado and the involvement of both presidents. The involvement of both presidents and the refusal of the IBWC to involve the Colorado's water in the conflict have prevented the conflict over water use in the Rio Grande from undermining broader Mexico-U.S. relations, at least as of 2003. As of 2003, Texas officials and irrigation district representative continue to assert that Mexico must comply with its treaty obligations; they also recognize that an immediate repayment of the 1.5 million acre feet water debt is not likely (Combs, 2003).

## **5. Discussion and Conclusions**

This study demonstrates the difference between short-term linkages, long-term linkages and how spatial and issue linkages intertwine. Short-term linkages can facilitate agreement, but terminate afterwards. Such an example is Minute 308 discussed above which links the Mexican emergency water deliveries on the Rio Grande to NADB aid money. Long-term linkages are advanced in order to enhance cooperation, but they continue after agreement. The spatial linkage between the Colorado and the Rio Grande water is a long term linkage that still affects water management along the border. In some cases both types of linkages are combined. This was the case in the U.S-Mexico transboundary water treaty where the U.S. accepted the long-term spatial linkage between the Colorado and the Rio Grande water in return for the short-term Mexican support for the establishment of the United Nations.

Spatial linkage can create short or long-term complications. In the US-Mexico rivers' case, sovereignty concerns within the U.S., where interstate water tradeoffs contradicted the perception of water as a state and local issue, delayed US-Mexico negotiations due to the increase in the number of stakeholders involved in the negotiation process. Spatial linkages led to inconsistencies in the legal doctrines argued by each side during negotiations. One long-term implication is that neither nation has an incentive to renegotiate the treaty in order to adapt the linkage to new hydrological conditions because so many issues that once were contentions could be reopened. Despite the changing water demand patterns within Mexico and the conditions of continuing drought, Mexico has to keep delivering to the U.S its water obligation under the 1944 Treaty, even as it seeks to pressure the border states to deliver water. In this case treaty renegotiation is neither a necessary nor even a certain means to resolve the water deficit. As Tate has shown, an aggressive irrigation water conservation program along both sides of the Rio Grande and within the Rio Conchos basins is more likely to provide a reliable means of assuring treaty deliveries than even a policy of strict compliance with treaty water release provisions in the absence of irrigation water conservation (Tate, 2002).

The spatial linkage of the Rio Grande and Colorado River basins designated one institution to implement one treaty for repetitive transactions, whereby Mexico and the U.S. deliver to each other a set amount of water annually. Any attempt to renegotiate water deliveries along the Rio Grande could affect delivered flows on the Colorado. As a result, Mexico seeks to use the 5-year loan mechanism, the Minute mechanism, the water-in-storage re-designation mechanism, as well as NADB funds for irrigation water conservation investments to increase its flexibility to address current conditions through the 1944 treaty.

The limited adaptive capacity Mexico currently has is a result of the long term implications of the linkage. Yet, an agreement was not possible unless the linkage was made. Thus, the question is not whether or not to adopt a linkage, but rather how to reduce the cost of linkages. Indeed, each party did anticipate short-term implications of including multiple border rivers in the treaty as indicated by U.S. "denials" of the spatial linkage and the Mexican amendment of its constitution. These tactics enabled the federal governments to overcome dramatic opposition, widening the 'winsets' for an agreement at the international level (Putnam, 1988). Long-term linkage implications also were anticipated by both parties. Mexico and the U.S. incorporated in the treaty a Minute mechanism that allows the two parties to come to an agreement over a contested issue. The treaty includes a drought escape clause that enables a party to suspend the linkage at times of a drought. This escape clause enabled Mexico between 1953-58 to overcome a water shortage in the basin by postponing its water deficit to the next five-year cycle (IBWC, 2002). However, this clause has been insufficient in a situation of a multi-year drought and increased water demand, such as has occurred along the Rio Grande that has led to Mexico's failure to meet treaty water delivery provisions during two five-year cycles. Although the Minute mechanism has provided a temporary solution to the conflict (it enabled emergency water releases to the US), it has yet to be used to supplement the existing treaty with a permanent drought mechanism. Also the existing conflict resolution mechanism is not sufficient to mitigate the adverse effect of the linkage legacies (one treaty and one institutions to manage both basins) for the adaptive management of the treaty.

Much of this cost could have been avoided if some of the mechanisms to address events of climate uncertainty excluded during the negotiation phase would have been incorporated in the treaty. Yet, as was mentioned these mechanisms were associated with high political cost that blocked the way for their inclusion in the 1944 Treaty. Thus, the long term implications of linkages are an outcome of a politically feasible agreement, which almost always is not an ideal

treaty. These findings highlight the need to look for mechanisms that are simultaneously politically feasible and hydrologically effective. If incorporated such clauses may allow for adaptation without re-opening the treaties for renegotiation.

While highlighting the adverse affects of linkages around natural resources, this study also identifies long term implications that are viewed by many of the decision makers as positive. Among these implications is the ability of the linkage managerial legacies to strength the treaty for over half a century of rapid change by setting one pact for both basins and by assigning one commission to manage it. These linkage legacies have the ability, for the time being, to counterweigh local pressure groups calling for the treaty's renegotiation and thereby to maintain the existing treaty. This is seen as positive as many believe that under today's circumstances a better treaty could not be achieved. It seems also that these legacies provide Mexico with an incentive to seek a solution to the conflict, as it has delivered emergency water to the U.S. and remain committed to pay back its water debt.

This paper has documented how one pact and one commission to manage multiple basins can be adapted over sixty years of rapid change. This case also shows how issues of natural resources, often considered as the matter of "low politics," can be linked to issues of "high politics." This case shows the importance of mechanisms within a treaty to enable the parties to adapt linkages to new conditions.

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**Fig. 1. The transboundary basins between the US and Mexico**