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Coping with Drought on an International River under Stress: The Case of the Río Grande/Río Bravo

The twentieth century has been one of great achievement on the Río Grande/Río Bravo. In the face of fierce competition and after bitter and protracted negotiations, we have been able to allocate the use of the waters of this life-giving river at the international, interregional and interstate levels, and we have been able to do it through mutual agreement.

By two interstate compacts and two international treaties we have successfully established the share of the waters of the Río Grande that each of the major parties is entitled to use. The two treaties are (1) The 1906 Río Grande Treaty,¹ and (2) The 1944 Río Grande and Colorado River Treaty.² The two interstate compacts are (1) The Río Grande Compact of 1938,³ and (2) The Pecos River Compact of 1948.⁴

The conflict over the Río Grande began over a century ago. Rapid increases in irrigation in the late nineteenth century began to pit state against state and country against country. Irrigated acreage in the San Luis Valley in Colorado ballooned six-fold in a 20-year period. Between 1870 and 1890, irrigation was expanded from 50,000 acres to 300,000 acres⁵ and the impact was quickly felt downstream. Farmers in New Mexico "became alarmed about the diminishing flow of the river. They had always assumed there would be ample water...."⁶ Shortages soon appeared in the El Paso-Juárez region. Mexican farmers were caught with insufficient water supply and many had to abandon their farms.⁷

"As water for the El Paso-Juárez valley declined, rivalry among the border peoples was intensified."⁸ The Mexicans accused the Texans of

* Director, International Transboundary Resources Center, Professor Emeritus, University of New Mexico School of Law. The Journal is saddened to note that Professor Utton passed away September 29, 1998. For more on Professor Utton please see the *In Memoriam* in this issue of the Journal.

1. Convention Between the United States and Mexico Providing for the Equitable Distribution of the Waters of the Río Grande for Irrigation Purposes, May 21, 1906, 34 Stat. 2953 [hereinafter 1906 Río Grande Treaty].

2. Treaty Between the United States of America and Mexico Respecting the Utilization of the Waters of the Colorado and Tijuana Rivers and of the Río Grande, February 3, 1944, U.S.-Mex., 59 Stat. 1219 [hereinafter 1944 Río Grande and Colorado Treaty].

3. Río Grande Compact, May 1, 1939, Colo.-N.M.-Tex., Ch. 155, 53 Stat. 785.

4. Pecos River Compact, June 9, 1949, N.M.-Tex., 63 Stat. 159.

5. See NORRIS HUNDLEY, JR., *DIVIDING THE WATERS* 19 (1966).

6. *Id.*

7. See *id.* at 24.

8. *Id.* at 20.

bringing on the shortage and the Texans pointed their fingers at the Mexicans. After charges and counter charges came threats of violence.⁹

The issue became a "cause celebre" between Mexico and the United States. The Mexican Foreign Minister, Matias Romero, vigorously declared that the time had come "to remedy the evils...suffered by the Mexican bank of the Río Grande."¹⁰ Secretary of State Olney decided the situation had reached an intolerable stage, and the International Boundary Commission was asked to study the problem.¹¹ The official report confirmed that diversions up-river, especially in the San Luis Valley of Colorado, had greatly reduced the flow of the river and that "the diversions had seriously hurt farmers in New Mexico as well as in Texas and Mexico."¹²

After further discussions and delays over where the storage works should be located, what are the requirements of international law, and Mexican claims for compensation for damages suffered, the American Secretary of State informed Mexico that the United States was eager "to deal with the question on principles of highest equity and comity."¹³ On May 21, 1906, the Treaty was signed. It covered that reach of the Río Grande above Ft. Quitman, Texas, to the headwaters in the Colorado Rockies and allocated 60,000 acre-feet per year to Mexico. The diversion and storage works would be built and paid for by the United States and Mexico would waive its claim to compensation for damages.¹⁴

The Elephant Butte Dam in New Mexico, 100 miles upstream from El Paso and Juárez, would not only provide the storage for deliveries to Mexico, but would provide water for extensive irrigation in Texas and New Mexico. The Treaty and accompanying storage works amicably settled the dispute between Mexico and the United States as well as benefitted farmers in southern New Mexico and in Texas.

However, yet to be resolved were the internecine disputes of the three states of the Upper Río Grande: Colorado, New Mexico, and Texas.¹⁵ The interstate situation was becoming increasingly aggravated;¹⁶ and after repeated lawsuits, extended engineering studies, and prolonged negotiations, the 1938 Río Grande Compact was agreed upon by the signatory states.¹⁷ It resolved "forty years of interstate conflict."¹⁸ Through a

9. *See id.*

10. *Id.* at 22.

11. *See id.* at 24.

12. *Id.* at 24-25.

13. *Id.* at 29.

14. *See id.*

15. *See* IRA G. CLARK, *WATER IN NEW MEXICO* 217 (1987).

16. *Id.*

17. Río Grande Compact, *supra* note 3.

18. CLARK, *supra* note 15, at 221.

complicated series of delivery schedules, Colorado is required to deliver specified quantities to New Mexico and, in turn, New Mexico to Texas.

In times of shortage, states have to strain to meet the delivery requirements and thirsty users chafe at the restrictions, but, by and large, the Compact has worked with the help of the not-infrequent prodding of the federal courts and careful monitoring.

The combination of the 1938 Compact and the 1906 Treaty allocated the use of the Upper Río Grande—the Treaty addressed the interstate and international allocations and the Compact, and in sum completed the allocation of the region (the Upper Río Grande Drainage Basin) from the headwaters in Colorado to Ft. Quitman, Texas.

The allocation had taken more than half a century since the issue was raised by the rapid development in the San Luis Valley between 1870 and 1890. The allocation of the Lower Rio Grande—that part of the basin from Ft. Quitman to the Gulf—came with the 1944 Water Treaty Between Mexico and the United States.¹⁹ This Treaty was consummated in the midst of World War II after years of negotiations.²⁰ The 1944 Treaty simultaneously allocated the respective shares of two countries in the use of the Colorado and the Río Grande. The allocation on the Río Grande/Río Bravo is quite complex, using different formulae for the various tributaries such as the Río Conchos, Río Salado and Río San Juan, while allocating the flow on the main stream roughly equally between the two countries.²¹ The Pecos River is a tributary to the Río Grande, and the interstate use of its waters was established by the Pecos River Compact of 1948.²² So, by the middle of the twentieth century, the shares of the various parties to use the waters of the Río Grande/Río Bravo were established. It took two international treaties and two interstate compacts, fierce differences and difficult negotiations, but the major parties had successfully reached agreement by peaceful means, and, in so doing, had provided certainty and stability as a foundation stone upon which the people of the basin could build their futures. It was an achievement of historic dimensions.

19. See 1944 Río Grande and Colorado River Treaty, *supra* note 2, art. 4.

20. See Charles J. Meyers & Richard L. Noble, *The Colorado River: The Treaty with Mexico*, 19 STANFORD L. REV. 367 (1967).

21. See 1944 Río Grande and Colorado River Treaty, *supra* note 2, art. 4, 10.

22. Pecos River Compact, *supra* note 4.

COPING WITH DROUGHT

In this complex allocation structure, what happens when there is less water than normal—when there is a drought?

The 1906 Treaty obligates the United States to deliver a set quantity of water to Mexico, i.e., 60,000 acre-feet per year, but it also provides that in the case of "extraordinary drought...the amount delivered to the Mexican Canal shall be diminished in the same proportion as the water delivered" to the United States' irrigation systems.²³ In fact, fourteen times in the last 50 years deliveries to Mexico have been reduced.²⁴ This is fairly easy to do since the regulation of deliveries to the irrigation districts in Mexico, New Mexico and Texas is provided by the same reservoirs upstream—the Elephant Butte Dam and Caballo Reservoir. Thus, when water is short, deliveries to each of the irrigation districts can be reduced proportionately.

The 1944 Treaty is much more complex in regard to the Lower Río Grande. Article 4 of the Treaty allocates the use of the waters below Ft. Quitman as follows: (1) The United States receives all of the water of its major tributaries, e.g. the Pecos River, Devil's River and Goodenough Springs,²⁵ (2) The United States is entitled to one-third of the flow of the major Mexican tributaries up to a maximum of 350,000 acre-feet, e.g. the Río Conchos, Río Escondido and Río Salado,²⁶ and (3) The waters of the Río San Juan and Río Alamo belong entirely to Mexico.²⁷

However, Article 4 provides that "in the event of extraordinary drought...on the measured Mexican tributaries, making it difficult for Mexico to make available the run-off of 350,000 acre-feet (431,721,000 cubic meters) annually...any deficiencies existing at the end of the five-year cycle shall be made up in the following five-year cycle with water from the said measured tributaries."²⁸

In addition, provision is made for flexibility in order to move water from one country to the other in the case of drought. Article 9 provides that in the Río Grande "the Commission shall have power to authorize either country to divert and use water not belonging entirely to such country, when the water belonging to the other country can be diverted and used without injury to the latter and can be replaced at some other point on the

23. 1906 Río Grande Treaty, *supra* note 1, art. II.

24. See DAVID J. EATON & DAVID HURLBURT, CHALLENGES IN THE BINATIONAL MANAGEMENT OF WATER RESOURCES IN THE RÍO GRANDE/RÍO BRAVO 14 (1992) (U.S.–Mex. Policy Report, No. 2, Univ. of Tex. at Austin).

25. See 1944 Río Grande and Colorado River Treaty, *supra* note 2, art. 4(B)(a).

26. See *id.* art. 4(B)(c).

27. See *id.* art. 4(A)(a).

28. *Id.* art. 4(B)(d).

river."²⁹ "The Commission shall have the power to authorize temporary diversion and use by one country of water belonging to the other when the latter does not need it or is unable to use it...."³⁰

"In the case of the occurrence of an extraordinary drought in one country with an abundant supply of water in the other country, water stored in the international storage reservoirs and belonging to the country enjoying such abundant water supply may be withdrawn, with the consent of the Commission, for the use of the country undergoing the drought."³¹

In contrast to the complexity of the drought provisions of the 1944 Treaty for the Río Grande, the provisions in regard to the Colorado are relatively simple and are similar to the approach of the 1906 Treaty. Article 10 in regard to the Colorado provides that "in the event of extraordinary drought or serious accident to the irrigation system in the United States, thereby making it difficult for the United States to deliver the guaranteed quantity of 1,500,000 acre-feet (1,850,234,000 cubic-meters) a year, the water allotted to Mexico under...this Article will be reduced in the same proportion as consumptive uses in the United States are reduced."³² This language is a slightly refined copy of the drought provision in the 1906 Treaty, and is made possible because in both cases (1) a specified quantity of water is to be delivered annually and (2) storage and delivery is from a single source, i.e. the main stem of the river rather than a variety of tributaries.³³

In the case of the two Compacts, the Pecos River Compact³⁴ and the Río Grande Compact,³⁵ the question of low flows is taken care of by the basic concept used in the Compacts. The Compacts provide for variable deliveries based on river flows rather than a fixed quantity of water to be delivered. Both Compacts are based on input-output models so that as the river flow goes up or down in a particular year the amount of water that the upstream state must deliver to the downstream state goes up or down. Thus, under drought conditions the amount that the upstream state must deliver is reduced accordingly.

In sum, we have a variety of approaches for dealing with drought in the Río Grande: (1) proportionate reductions in the case of "extraordinary drought" under the 1906 Treaty; (2) In the case of "extraordinary drought," deficiencies at the end of a five-year cycle shall be made up in the

29. *Id.* art. 9(d).

30. *Id.* art. 9(e).

31. *Id.* art. 9(f).

32. *Id.* art. 10.

33. See 1906 Río Grande Treaty, *supra* note 1, art. II; 1944 Río Grande and Colorado River Treaty, *supra* note 2, art. 10.

34. Pecos River Compact, *supra* note 4.

35. Río Grande Compact, *supra* note 3.

following five-year cycle under the 1944 Treaty in the Lower Río Grande; (3) Input-output models for reducing deliveries to downstream states are based on a sliding scale as river flows decline. This is the approach of both the Pecos River Compact and the Río Grande Compact.

The Río Grande/Río Bravo has been a laboratory during the twentieth century, a laboratory that has produced a variety of methods for apportioning the use of international/interstate rivers between co-riparians as well as a range of approaches for dealing with drought in an international/interstate drainage basin.

A LOOK AT THE FUTURE

The twentieth century has been a century of triumph. In the face of fierce competition for water and stubborn and difficult negotiations, the parties, nations and states alike, have been able to agree peacefully on their respective shares of these life-giving waters, and they have been able to establish methods for reducing those shares in times of drought.

But what of the future? Just as we can call the twentieth century "The Century of Achievement," we may anticipate calling the twenty-first century "The Century of the Pinching Shoe." Population growth and economic development are placing dramatically increasing demands on the waters of the Río Grande Basin. The 60,000 acre-feet of the 1906 Treaty may have seemed like a lot at the beginning of the century when the population of Juárez was 8,000 and the population of El Paso was 16,000.³⁶ Now, as we accelerate into the twenty-first century, Juárez has more than a million inhabitants and is on its way to two million.³⁷ El Paso now has an estimated population of 600,000 as it reaches for one million.³⁸ These numbers not only place stress on the physical limits of water available, but will raise questions about the equity of the hard fought allocations achieved in the twentieth century. Adjacent Doña Ana County, New Mexico, was home for 12,893 residents in 1910,³⁹ 30,411 in 1940,⁴⁰ and now is approaching 150,000.⁴¹

36. See U.S.-Mex. Border Statistics Since 1900, 1990 Update 49, (David E. Lorey ed., Univ. of Cal. at L.A., Latin American Center Publications 1993).

37. See *id.* The estimates are by Dr. Richard Bath, Dep't of Political Science, Univ. of Tex. at El Paso.

38. See *id.*

39. See Lorey, *supra* note 36, at 43.

40. See NEW MEXICO IN MAPS 153 (Jerry L. Williams ed., Univ. of N.M. Press 1986).

41. See Lorey, *supra* note 36, at 45.

New Mexico as a whole had just over 300,000 residents in 1910.⁴² As we end the twentieth century and are about to embark on the twenty-first century, it has a population trajectory, actual and projected, as follows: 1980—1,300,000,⁴³ 1990—1,500,000,⁴⁴ 2000—1,800,000,⁴⁵ and 2010—2 million.⁴⁶

Over half of the population of New Mexico resides in the Upper Río Grande Drainage Basin, so more than one-million are projected to live in and depend on the Río Grande Drainage Basin.⁴⁷

In the Lower Río Grande, Monterrey has grown from 62,266 residents in 1900 to over a million in 1990, an increase of 1,600 percent.⁴⁸ Brownsville, Texas, had 6,305 residents in 1900 and 98,962 by 1990,⁴⁹ again a nearly 1,600 percent increase.

If one dared to look into a crystal ball, one might be tempted to say that the pressures of population and economic growth are likely to lead to various impacts such as: (1) There will be much greater conservation of existing supplies. Water supplies will have to be stretched by much more careful usage; (2) Competition between users will greatly increase; (3) Water increasingly will be switched from agricultural to municipal and industrial uses because many more jobs can be produced by industry with an acre-foot of water than can be produced by agriculture; (4) Limits on growth will confront the region; (5) Concepts of and the means for sustainable economic development will become imperative; and (6) International and interstate apportionments, hard earned in the twentieth century, will be increasingly challenged in the twenty-first century.

If we used the metaphor of a foot in a shoe in which the population depending on the Río Grande were a growing foot, and the water supply were the shoe that surrounds, protects, and allows the foot to grow and prosper—then we would predict that early in the twenty-first century the shoe will begin to pinch.

Already, we are, either advertently or inadvertently, in some urban areas exceeding the surface supplies and drawing down our groundwater reserves. The combined metropolis of Juárez and El Paso is advertently drawing down its mutually shared aquifer, the Hueco Bolsón by some

42. See Williams, *supra* note 40, at 153.

43. See *id.* at 150.

44. See Interviews with Brian MacDonald, Dir., Bureau of Business Research, Univ. of N.M.

45. See *id.*

46. See *id.*

47. See *id.*

48. See Lorey, *supra* note 36, at 31, 33.

49. See *id.* at 49.

estimates at 20 times the annual recharge rate,⁵⁰ and it is predicted that the utility of the aquifer will be exhausted by 2030 or so.⁵¹ In Albuquerque the aquifer has been inadvertently drawn down due to apparently erroneous earlier hydrogeologic knowledge.

Groundwater reserves are the savings accounts that can be called upon to tide us over periods of low surface flows. Thus, especially in El Paso/Juárez we are depleting our savings account, the drought reserve. Thus, not only can one suggest that the twenty-first will be the century of the pinching shoe, but, additionally, during periods of drought the shoe will contract, crinkle and crack and the foot within will be subjected to sharp discomfort and, perhaps, traumatic dislocation.

50. See J.C. Day, *International Aquifer Management: The Hueco Bolsón on the Río Grande River*, 18 NAT. RESOURCES J. 163, 168 (1978).

51. Lee Wilson, *Water Supply Alternatives for El Paso*, at A8-A10 (1981) (report prepared for El Paso Water Utilities Board, El Paso, Tex., by Lee Wilson & Associates, Inc., Santa Fe, N.M.).