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THE UPPER RIO GRANDE

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THE RIO GRANDE RIVER

The Rio Grande has its headwaters in south central Colorado and flows 1900 miles to the Gulf of Mexico. From Colorado it flows south through the length of New Mexico; it then turns southeast at El Paso, Texas, on its way to the Gulf. The river forms the boundary between the Republic of Mexico and the United States, from El Paso to the Gulf.

The river generally is considered to have three regimes in the United States: the river from its head in Colorado to Fort Quitman, Texas (approximately 80 miles downstream from El Paso, Texas); the Pecos River; and the main stem from Fort Quitman to the Gulf. The reach of the river above Fort Quitman, including parts of Colorado and New Mexico, and very small parts of Texas and the Republic of Mexico, is known as the Upper Basin; below Fort Quitman is the Lower Basin.

THE UPPER RIO GRANDE

Because the Upper Rio Grande area is primarily an arid region, the Rio Grande River has considerably more influence upon the lives and livelihood of the region's inhabitants than does any other element of the physical environment. History records that chronic surface water shortages in this region and controversies over division of the river's water between areas of Colorado, New Mexico, Texas, and the Republic of Mexico have existed for over a hundred years. These controversies have resulted in an international dispute between Mexico and the United States and three separate instances of litigation between Colorado, New Mexico, and Texas.

The Upper Rio Grande watershed is one of the longest inhabited, longest irrigated, and fastest growing sections of the United States. El Paso, Texas, and Las Cruces, New Mexico, in the United States of America, and Juarez, Chihuahua, in the Republic of Mexico, represent the population center for the southern portion of this watershed. The watershed drains an area of about 32,000 square miles above Fort Quitman.

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The Upper Basin is comprised of three sub-areas, designated as the San Luis section in Colorado, the Middle section in New Mexico, and the Elephant Butte section in southern New Mexico, including extreme West Texas and the adjacent river valley in the Republic of Mexico.

The San Luis Valley is a large north-tending structural depression surrounded on the west, north, and east by mountains. It is a high, flat mountain valley with an average altitude of about 7,700 feet. The valley is semi-arid, and a successful agricultural economy would not be possible without irrigation. The main crops produced are alfalfa, potatoes, barley, oats, hay, and pasture. Irrigation development began in the San Luis Valley after 1850 and the oldest water right in the valley is dated 1852. Rapid and extensive settlement, which utilized waters from the Rio Grande, occurred after construction started in the valley on the Denver and Rio Grande Railroad in 1879. The Middle Rio Grande section was one of the first areas in the Western Hemisphere to be occupied by man. Agriculture was first practiced here by the Anasazi Indians who evolved into the people of the Pueblo eras.

COLONIZATION

Spanish colonization began with the founding of San Gabriel, near the present-day San Juan Pueblo, in 1598. It is estimated that by 1750 about 4,000 colonists had settled in the Middle Rio Grande section. In 1848 the New Mexico territory was taken over by the United States as part of the spoils of the Mexican-American War. The introduction of Anglo settlers was slow until after the Civil War, at which time there was a great influx. This, coupled with the growing Spanish population, placed heavy demands on the water resources of the area.

Spanish supply trains for northern New Mexico traveled from Mexico City to the Rio Grande and crossed at Paso del Norte, the natural pass through the mountains that is now the site of El Paso and Juarez. Colonists and supplies moved steadily north and south through the territory. Communities grew up on both sides of the river in the El Paso area. The area south of the river contained the dwellings and markets of the wealthy Spanish. Americans began arriving in the area in the early 1800's, and Franklin, a small trading post, was established just north of the river in 1827.

Later, El Paso became a major terminal on the Butterfield trail route between Missouri and California. With the discovery of gold in California in 1848, the predominance of travel through the area was shifted from north-south to east-west. Before and after the American Civil War, various Army posts were established in the region to

control the Apache Indians. Las Cruces became the county seat of Dona Ana County in 1852 and El Paso was officially named in 1858. In 1888, Juarez, Mexico, was named in honor of President Benito Juarez, who had defeated the French and had established his capitol in that city.

IRRIGATION HISTORY

Irrigation in the El Paso-Juarez area dates at least to the establishment of a Spanish Mission in 1659 in what is now downtown Juarez. There is no evidence that the Pueblo Indians, or others, utilized the water resources of the Rio Grande for agriculture in this section prior to Spanish colonization. However, some students of southwestern prehistory believe that the use of river irrigation was widespread and flourishing before the entrance of the Spanish.¹ They base their beliefs primarily on scattered references to irrigation practices in the narratives of some of the early Spanish explorers and in Pueblo mythology. Other archaeologists, more familiar with evidence of agricultural practices, are not convinced about the extent and use of river irrigation.² There is little evidence concerning the presence of river irrigation systems in the pueblos that were later abandoned, and of the seventy to eighty pueblos existing in 1540, only nineteen remain. It is difficult to determine the age of irrigation works in the surviving pueblos because so many changes have been made and because the Rio Grande Pueblos have been reluctant to allow archaeological research in their communities.

Irrigation development in the El Paso Valley under the Spanish reached about 40,000 acres. However, because of lack of proper drainage and other reasons, the area under irrigation in the El Paso Valley had been reduced to a fraction of its ultimate development by the mid-1800's. In 1881, the first Southern Pacific train arrived in El Paso, and other lines arrived shortly thereafter. Work on the railroads and the opening of new markets induced rapid development of irrigated agriculture.

During this period a number of private irrigation companies sprang up in the Rincon, Mesilla, and El Paso valleys. These were mostly ditch companies and were generally ill-conceived and crude attempts

1. E. DOZIER, *THE PUEBLO INDIANS OF NORTH AMERICA* (1970); F. EGGAN, *SOCIAL ORGANIZATION OF THE WESTERN PUEBLOS* (1950); Wittfogel & Goldfrank, *Some Aspects of Pueblo Mythology and Society*, 56 *J. AM. FOLKLORE* 17 (1943).

2. Bryan, *Flood-Water Farming*, 19 *GEOGRAPHICAL REV.* 444 (1929); Carter, *Plant Geography and Culture History in the American Southwest*, VIKING FUND PUBLICATIONS IN ANTHROPOLOGY No. 5 (1945); Stewart, *Conservation in Pueblo Agriculture*, 51 *THE SCIENTIFIC MONTHLY* 201, 329 (1940); Woodbury, *Prehistoric Agriculture at Point of Pines*, *MEMOIRS OF THE AM. ARCHAEOLOGICAL SOC'Y* No. 17 (1961).

to direct the flow of the river into a main ditch which would water a few hundred acres. However, one of the largest proposals involved the international sale of stock. The Rio Grande Irrigation and Land Company Limited, an English corporation, was formed for the purposes of irrigating, colonizing, and improving the lands in the Rio Grande Valley between Engle, New Mexico and El Paso, Texas. The forerunner of this company incorporated in 1893 and received the consent of the Department of the Interior for a reservoir site at the present Elephant Butte Dam for the right-of-way for canals. The prospectus for this company, published as part of President McKinley's message to the Senate on the Equitable Distribution of the Waters of the Rio Grande, stated:

In the Rio Grande Valley the inexhaustible fertility of the soil, the capabilities for irrigating with the fertilizing waters of the Rio Grande—the Nile of America—combine with the exceptionally fine climate. . . .

The completion of the company's system of canals will bring 230,000 acres of valley land under ditch, and by the construction of the high level canal about 300,000 acres of magnificent mesa [low-lying table lands] can be irrigated.

The amount of fertile alluvial lands capable of being irrigated by the company's canals, when completed, is limited only by the flow of the Rio Grande, which is one of the largest of the American rivers. . . .

Many of the owners of irrigable lands in the valley have already contracted to convey to the vender company one-half of their lands in return for water rights to the other half. . . .

Obviously the remaining land owners must, in order to render their properties of value, concede a large portion of their lands for water rights. . . .

In the early 1890's, water shortages began to occur in the Mesilla and El Paso Valleys. People across the river from El Paso complained to the Mexican Government about these shortages. The matter was taken up through diplomatic channels and Mexico filed a claim for damages of 35 million dollars against the United States. It was alleged in the claim that these shortages were due to increased diversions from the Rio Grande by Colorado and northern New Mexico.

As a result of the Mexican claim for damages, the International Boundary Commission was directed to study and make a report of the

use of water from the Rio Grande above Fort Quitman. Under appointment from the Commission, W. W. Follett, a civil engineer, made a comprehensive investigation. Follett's summary of findings follows:

1. The fact of a decrease in the flow of the river at El Paso exists, as claimed, and dates back to 1888 or 1889. Before those years, the river went dry at intervals of about ten years. Since 1888, it has been dry every year but two.
2. The use of water for irrigation has not increased materially in New Mexico since 1880, and hence is not a cause of this decreased flow.
3. The use of water in the San Luis Valley of Colorado has increased very largely since 1880, and at present stage of development it takes from the river, in excess of what was taken in 1880, an amount of water equivalent to a flow of 1,000 second-feet, running for one hundred days; at least this amount is taken, and probably more.
4. It is impossible to state specifically how much water was in the river prior to this increased use of water and since, as the records do not antedate the increased use and as the flow since records began varies within very wide limits.
5. This flow of 1,000 second-feet, if allowed to remain in the river, would do much toward preventing a dry river at El Paso.
6. The Mexican and American citizens of the El Paso Valley have suffered in common with their neighbors of the Mesilla Valley and those still further up the river from this increased use of water by Colorado. The suffering has been greater in the El Paso Valley than elsewhere.
7. All of the summer flow of the streams in the San Luis Valley except their floodwaters is now appropriated and, therefore, the use of water for direct irrigation is not likely to increase materially in the future.

The Mexican Government vigorously protested the building of a private dam at Engle, but was in favor of an international dam to be built above El Paso in the Mesilla Valley. It is interesting to note that the Secretary of the Interior did not have power to revoke the permit for building the private dam but that the Department of State, with the support of the Secretary of War, intervened. It did so on the basis that the Rio Grande was navigable and that it was necessary to obtain the permission of the Secretary of War to build a dam thereon. There were several private interests involved in support of both the Elephant Butte Dam site and the International Dam site above El Paso, due to the possible sale of private land and other advantages.

The net result was the authorization for the construction of Elephant Butte Dam in 1905 under the Reclamation Act of 1902.

A treaty between the United States and Mexico was signed in 1906 that provided for the delivery in perpetuity of 60,000 acre-feet of water to Mexico and, in turn, for the relinquishment by Mexico of all claims for damages. The Elephant Butte Dam and canal system were completed in 1916.

The international problem was relieved, but the distribution of Rio Grande waters between the states of Colorado, New Mexico, and Texas intensified. The Rio Grande Compact Commission was formed, composed of a representative from each of the three states and a representative of the federal government. The first meeting of the Commission was held October 24, 1924, at Colorado Springs, Colorado, with Herbert Hoover, Secretary of Commerce, representing the federal government as chairman. In 1929, a temporary compact was agreed upon. A formal compact was finally agreed upon in 1938 which set forth the quantitative obligations for Rio Grande flow.

In 1951, Texas instituted legal proceedings against New Mexico in the U.S. Supreme Court, but after several years of legal maneuvering the action was dismissed because the United States was not a party to the suit. In 1966, Texas and New Mexico instituted legal proceedings against Colorado for non-delivery of water under the terms of the Compact. The Supreme Court granted a continuance of this suit, subject to subsequent compliance with the terms of the Compact by Colorado. That continuance remains in effect.

CONCLUSIONS AND RECOMMENDATIONS

The foregoing historical background outlines some of the problems to be considered in arriving at an equitable distribution of the surface waters between Colorado, New Mexico, and Texas, and between the United States and Mexico, for the purpose of giving some perspective on the more difficult problems of reaching an agreement on the use of shared ground waters and the physical environment.³

The regional problem is not merely one of drafting an apparently workable management plan, but the considerably more complex problem of developing the background information and theory on which the plan is to be based. The principal problems are the lack of adequate basic understanding of what should and can be done to protect the quality of the environment in the region and the lack of

3. These objectives are set forth in J. Hernandez, New Mexico Water Resources Research Institute Proposal No. 008, Rio Grande Regional Environmental Project.

appropriate procedures within existing agencies through which a management plan would be put into action. The development of a comprehensive research program is proposed to provide the basic data and information on which to base a regional environmental management plan that will include appropriate implementation procedures within the existing governmental structure. This plan must be founded on basic research and updated socio-economic theories that include consideration of public rights to environmental quality, while enhancing and expediting sound economic development. Only after such studies have been completed can a coordinated management program, to be implemented through existing agencies within their areas of jurisdiction, be designed.

An appropriate research design would include the following elements:

1. an evaluation of the attitudes, goals, and priorities of the residents of the various geographic, cultural, and economic sectors of the region;
2. an evaluation of the present utilization of the environment and the potential for renewal and enhancement of the regional environmental resources;
3. an evaluation of the complex interrelationships between various elements that constitute the region's environmental resources and the relative effects of various levels and types of growth on these elements;
4. a study of the institutional structure of the region, both intra- and extra-governmental, with respect to the legal status of each of the various parts of the structure, the inter-unit relationships, and the decision making potential of each;
5. the development and application of new technology, when appropriate, to evaluate, code, store, and synthesize the vast amounts of data available for the region;
6. the development of socio-political and economic resources management models designed to test and evaluate various management alternatives; and
7. the development of a regional environmental management plan and a plan for its implementation.

Due to the interstate and international character of the area, a suitable environmental management system for the region will be difficult to develop and implement. However, in this context of mixed interests, conflicts over environmental rights and priorities are bound to arise in the years ahead. Consequently, it is in the best interests of both nations to support the development of such a plan.

RESUMEN

La cuenca del Río Bravo Superior es una de las secciones de los Estados Unidos que está creciendo rápidamente. También, como un área poblada para muchos años, ha tenido una historia larga de riego. La colonización española de la región empezó en 1598, y según varias estimaciones, la región intermedia del Río Bravo tenía 4000 habitantes en 1750. Debido a la frecuente falta de agua en la zona, ha sido muchos controversios sobre distribución de las aguas del río.

La presa Elephant Butte, acabado en 1916, ha asistido a remediar el problema internacional entre los Estados Unidos y México. Las dificultades regionales que tratan de una distribución justa de las aguas subterráneas entre los Estados Unidos y México se presentan un problema más grave que lo de aguas superficiales. Se necesita mucho de planear y estudiar antes que las negociaciones pueden proceder.