

# Research paper on a new crisis: issues and concerns over water

[Environment](#), [Pollution](#)



## **Water: Threats and actions in Texas**

Water is one of the world's most wondrous and versatile resources. Water serves the needs of a diverse set of industries, from agriculture, sanitation, and household uses. It is also used to power electric power plants, crop irrigation needs, creates habitats, and satisfies the thirst of all living things on the planet. Though water such as sea water comes in abundance, it is a different story for freshwater.

Freshwater, compared to seawater or other sources of water, is extremely limited and scarce. In fact, it is one of the major challenges facing the international community. The planet is estimated to hold 1.4 billion kilometers of water; of this staggering amount, a mere 37 million cubic kilometers, or 2.5 percent, of the total are freshwater resources. Though this is still considered a large amount, the majority of the amount, 90 percent, is "stored" in the polar ice caps and in underground reservoirs that are inaccessible owing either to technological or economic reasons.

Approximately 30 percent of all freshwater sources are stored as groundwater. The volume of water held as groundwater stores is 100 times more than the load of water that is found in lakes and in rivers. Much of the water that has collected over the millennia has been stored in vast aquifers; these aquifers are recharged slowly by yearly rainfall, averaging from 0.1 percent to 3 percent per year.

For example, the recharge rate is at 1 percent, then only a mere  $110 \times 10^{12}$  cubic meters annually will be made available for sustained use of the global community. Rapid population growth, rising irrigation needs, and a host of other uses for water withdrawal is dramatically faster than the "natural

recharge rate” resulting in decreasing levels of water tables in a number of regions in the United States.

One of the larger aquifers in the United States, the Ogalla aquifer, is formed under several U. S. states. Among these states include, Texas, Nebraska, South Dakota, Kansas, Oklahoma, New Mexico, and Colorado has been reduced from its original size in 1950; in the work of Gleick (2002), the withdrawal rate of water from the aquifers is 10 times faster than the recharge rate (Pimentel, Berger, Filiberto, Newton, Wolfe, et al, 2004, p. 4).

One of the major water systems that pass through Texas is the Rio Grande. The river begins its journey from the melting snows in Colorado’s Rocky Mountains in the south, traveling more than 2, 000 miles until it reaches the Gulf of Mexico. However, as the Rio Grande passes by El Paso, Texas, the bottom of the river between Presidio and El Paso is dry owing to the volume of water that has been redirected from it (Rul, 2004, pp. 1-8).

The river provides drinking water for more than 13 million people as its waters flow down into the sea. However, by the time the river reaches the Gulf of Mexico, the massive river has been “ shrunk” to a mere stream if previous 1962 flow rates of an estimated 2. 4 million acre-feet per year are used. The River has been overused to give people in these areas with year-round water for a wide number of uses; agriculture, industry, and for the border region’s growing urban areas. In a growing number of places along the River, the channel bed is slowly but undeviatingly contracting and growing deeper, unable to move sediments that rest on the river bed. Presently, the environmental “ state” of the River is that it is in drought stage (Li, Kozel, Forster, Arnold, 2005, p. 3).

The largest demands on the Rio Grande system are generated and amplified by the dramatic population increase in Texas as well as in Northern Mexico. Northern Mexico has become one of the prime migration destinations within Mexico, and from 1920 to 1990, it was reported that the slowest growth rate on a yearly basis in Mexico's border urban areas matched the highest growth rate in Texas' largest urban areas. In the same period, the population of Texas grew by 1.8 percent, a third faster than the entire rate of the United States.

This population growth has resulted in large scale water pollution in the Rio Grande area. In a study of the University of Texas at El Paso examined the water quality level of the river flowing between Lajitas and La Linda, Texas. The research noted samples at ten different locations on the river's banks and the water in the region's back country region to generate a profile of the quality of the water. The research discovered that majority of the pollution within the Rio Grande system was the result of "run-offs" tainted by contaminants that the water picked up as the river traversed downstream from non-polluted areas in the El Paso, Texas area.

Another threat is from unrestrained water drilling from underground water sources. The El Paso and Juarez urban area is downstream from the Elephant Butte Reservoir. Juarez and Las Cruces source all their water from aquifers; El Paso gets 60 percent of its water requirements from aquifers as well. However, it has been noted that over the past four decades, the levels of the aquifers serving these two areas have been rapidly declining and are increasing becoming salty.

Often times, the Rio Grande is examined as a single organism; the flaw in

this approach is that the River is not. The Rio Grande must be seen as a part of a larger structure, made up of complicated parts. Dramatic growth fueled by the NAFTA along the border communities of the river is seriously threatening the integrity and well-being of the system, which is also the sole water resource for areas as Laredo. The primary challenges of the communities that line the River include their inability to develop infrastructures that will be able to address the environmental issues attendant to the growth of the population and progress.

In addition, municipalities must be able to develop measures to counter the overuse of groundwater resources, the contaminated run offs from commercial and local areas, and the millions of tons of untreated sewage that is allowed to be dumped in the Rio Grande from the Mexican side of the Rio Grande. The NAFTA agreement was supposed to provide billions of dollars to help in eliminating air and water pollution in the area; unfortunately, the projects that were supposed to be the beneficiaries of the funding from the trade agreement have often been delayed or severely wanting in funds. Officials on both sides of the border point to their counterparts as the source of the problem that is besetting the region in terms of water pollution (Rul, 2004, pp. 1-8).

Aside from aquifer depletion, another issue regarding water in the state deals with disposal facilities for the state's energy sector. Among the concerns that the United States Geological Survey (USGS) has dealt with in Texas include possible arsenic contamination in the Barnett and methane and carbon dioxide pollution in the Marcellus; however, no pollution in the Eagle Ford shale development area in South Texas has been detected.

Allowing the construction of disposal wells in South Texas is not altogether impossible; nevertheless, there are serious concerns being raised by the public in these areas. Among the proposals being considered is the use of old wells to serve as disposal facilities; however, the strength of the old casings has proven to be a major concern for residents in the area. The bore of the well must be placed at a safe distance from the aquifer to avoid possible contamination of the water source (Dunnahoe, 2013, p. 1).

Decrepit water management policies have resulted in water resources becoming increasingly scarce and of poor quality for consumption and use. Enhanced water management requires not only sound engineering practices, but also evaluation based on scientific investigation, effective agencies, and collaboration among all stakeholders in the issue. By combining all of these elements, these will amalgam into a viable water management policy. Rising demand and decreasing supply produces an array of discordant interests: between users that are located upstream and those located downstream, and ultimately, between Mexico and Texas (Rul, 2004, p. 15).

Population increases, urbanization, rising demands for agriculture, and economic progress all take a toll on scarce water resources. The depletion of the groundwater stores, rising consumption and an absence of a cohesive water use policy exacerbate the possibility of aggravating water issues rather than avoiding them in the future. By addressing these concerns, these will not only help in ensuring water supplies, but answer other attendant issues on health as well (Li, Kozel, Forster, Arnold, 2005, pp. 10-11).

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