The Competition for Water in the American Southwest

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Nora LeVasseur

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Nora LeVasseur

STS Advisor: Peter Norton

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Residents of the arid regions of California, Utah, Nevada, Arizona, and New Mexico have long competed for scarce fresh water supplies. Since the mid-20th century, rapid population growth in these five states has increased domestic, agricultural, and industrial water demand. In the Southwest, aquifers are hitting all-time lows. A *New York Times* study revealed that four out of ten wells across the U.S. recorded their shallowest water levels to date. "'From an objective standpoint, this is a crisis,' said Warigia Bowman, a water expert at the University of Tulsa. "There will be parts of the U.S. that run out of drinking water" (Rojanasakul et al., 2023).

This is largely the result of overdraft, when groundwater pumping and diversions deplete the water table faster than it can replenish itself. Since 1950, the extraction of surface and ground water has increased by more than 50% in these five states, 80% of which is due to irrigation (Heilman and Konieczki, 2004). The surge in water extraction prompts investigation into how agricultural groups, businesses, and residents promote water management policies and obtain withdrawal permits. Conflicts have arisen among residents and dairy farms, environmental advocates and farmers, and Native American tribes and governments. In each case, water has been politicized, monetized, and commodified. Access to this vital resource now hinges solely on the extent to which governments have ensured its fair distribution, alongside individual financial means, and legal prowess.

Literature Review

In the American Southwest and beyond, water allocation, management, and supply present challenges that intersect with issues of human rights, customary practices, indigenous

rights, and urban dynamics. Studies provide insight into these multifaceted issues. They offer perspectives on water governance that attempts to resolve competition among stakeholders, ensuring equitable supply and distribution.

Alcon et al. (2014) conducted case study research on the Segura River Basin in southeast Spain to evaluate farmers' adoption of supply-and-demand water policy. The policy adjustment would account for farmers' specific demand for water when distributing volumes. They found that farmers were willing to pay more than double current water prices to ensure supply reliability and exhibited a general aversity to other institutional changes. This literature speaks to the uncertainty of agriculture, shedding light on farmers' efforts to minimize instability.

Potter, Darmame, and Nortcliff (2010) researched issues of urban water supply in Greater Amman, Jordan. This study revealed a societal standard of minimizing water consumption. Jordanians have developed residential strategies to ration available water and are still content with the volume and quality of the supply.

Langford and Russell (2017) explore the nuanced disparity between the "right to water" and "water rights", illustrating how the implementation of the latter inadvertently erodes the former by transforming water into a tradable, profit-driven asset. In regions like Chile, Australia, and the western United States, permit systems were implemented to decentralize water management, distributing its management among individuals and industries. However, these systems often disrespect and ignore the indigenous conception of water. Ultimately, the water rights market rests on the assumption that rights will be optimally allocated to those most willing to pay.

Furthermore, Langford and Russell researched transborder water issues among the European river basins, the Nile River, and the Ganges River. In 1997, the UN Watercourses

Convention laid down a framework to ensure equitable and reasonable behavior among states utilizing shared international watercourses, with particular consideration given to upstream impacts on downstream countries. Southwestern aquifers are not necessarily shared across international borders, besides the Colorado River Basin which does extend into Mexico. However, the principles and strategies outlined by the UN offer valuable guidance for federal management across state lines.

When it comes to grappling with depleting irrigation and water supplies, previous research has centered around political approaches. Permitting systems, individual rationing, and transboundary agreements have attempted, both successfully and unsuccessfully, to solve this matter. Further research into the water resources landscape of the Southwest U.S. is critical to apply the policy conclusions of previous studies.

Landowners' Strategic Advantage

Cities in the Southwest navigate a delicate balance between growing urban populations and diminishing water supply, yet they have met this challenge head on. Between 2000 and 2020, the San Diego County Water Authority slashed its total water deliveries by 33%, with per capita water consumption witnessing a 43% decline (Richter, 2022). This was achieved by incentivizing homeowners to replace grass yards with water-efficient landscaping, which transformed 42 million square-feet of lawns. Melanie Buck, a resident of Encinitas, CA, participated in this initiative by planting native desert flora in her front yard. Reflecting on her experience in an interview with the Yale School of Environment, she noted, "It's quite a lot of maintenance, but our water bill is 50 percent less " (Robbins, 2022).

Similarly, the Phoenix Water Services Department decreased its total water deliveries by 9%, propelled by a comparable program aimed at curbing outdoor water usage. Former Phoenix Water director Kathryn Sorensen remarked, “In the 1970s, 80% of single-family homes had lush landscaping. Today that number is 10%. It’s been a wholesale change in how people use water” (Robbins, 2022). Homeowners have rallied behind city ordinances mandating reductions in daily residential water consumption, particularly outdoors. For urban landowners, adhering to these regulations is a straightforward, minimally disruptive adjustment to their routines. In some cases, it can even lead to financial gain. In the allocation of responsibility for mitigating water scarcity, landowners are presented with a convenient avenue to contribute their share.

The solution becomes more nuanced when addressing agricultural operations, given that landowner livelihoods are dependent on the productivity of the land. The Southwest utilizes 8% of its non-federal rural land for agriculture, most of which lies in California (USDA, n.d.). But California is not the only state where agricultural interests clash with those of residents. In Cochise County AZ, there is an absence of regulations for landowners of four acres and up. In 2014, Riverview LLP, a Minnesota-based dairy company, expanded their operations into Willcox Basin in Cochise County. At the time of their arrival, there was no statute limiting water extraction from the basin. They now own one-third of the 70,000 acres farmed within the basin, allowing them to drill more than 80 wells that extend at least 1000 ft into the ground. The water table has been declining steadily across the entire watershed, with wells running dry at an accelerated rate since Riverview’s arrival in 2014 (Bittle, 2022). Riverview’s spokesperson, Kevin Wulf, maintains that “because water usage and conservation is important to us, no matter where we're located, the water use regulation in Willcox was not a determining factor. We think about water and talk about water everywhere we're at” (Davis and Weingarten, 2021). Riverview

LLP asserts that they have reduced groundwater extraction for irrigation purposes in the Willcox region by implementing efficient irrigation systems, consulting with hydrologists, and supporting well-metering legislation. With that said, the company refuses to disclose their actual water consumption. Retired University of Arizona hydrologist Kristin Uhlman says, "The only reason the water tables are dropping is because more entities are pumping -- because there are no rules" (Davis and Weingarten, 2021). In the Willcox Basin, the expense of digging a well deep enough to reach current groundwater levels surpasses $40,000, which has uprooted small-scale farmers and residents alike. In many cases, those who cannot afford to stay have sold their land to Riverview LLP. However, these civilians harbor little resentment towards Riverview, as they were offered a fair price and acknowledge the beneficial impacts the dairy has had on the local economy. Riverview LLP employs 200 people in Arizona and has built employee housing on their premises. Regardless, a group of farmers, ranchers, and residents have organized, alongside former Governor of Arizona Bruce Babbitt, to negotiate a proposal that will impose regulations on rural groundwater extraction across Arizona. So far, these proposals have been denied committee hearings at the Arizona State Legislature (Davis and Weingarten, 2021).

In the Central Valley of California, the Cosumnes River carries a relatively small volume of water annually. Nevertheless, farmers use groundwater along its banks, depriving the river of flow during the dry season. The depleted water table and stream flow threaten the survival of Chinook salmon that spawn in this river basin (Zekster, Loaiciga, & Wolf, 2004). This begs the question, to what extent should ecological health be recognized as a stakeholder in the battle for groundwater across the Southwest as well? Conservancy groups in the region recognize the importance of land stewardship. In October 2020, the Sacramento Valley Conservancy (SVC) and Sacramento County Flood Control Agency (SCFCA) purchased 130 acres of agricultural

land to protect habitat for migratory birds, facilitate groundwater recharge, and improve the flow of surface water for salmon runs and spawning. Their initiative recognizes that "groundwater is a critical defense to extended droughts and climate change [and improves] natural flood control" (Sacramento Valley Conservancy, 2021). The acquired land includes agricultural operations such as the Elkhorn Basin Ranch, where the Yeung and Garcia families grow row crops and walnuts for local and global markets. "In coordination with the SVC, these two families maintain a productive working farm while also conserving the important habitat, the scenic views, the open space, and the rural flood protection values of the property" (Sacramento Valley Conservancy, 2021). This serves as a prime example of cooperative rather than adversarial relations between farmers, environmental groups, and ecological systems through land acquisition.

Furthermore, the greater Sacramento River Basin, in which the city of Sacramento lies, is made more resilient in the face of drought, climate change, and floods. The population of Sacramento has grown at a rate of 1.3% or more for the last 50 years, and will continue to increase (Macrotrends, 2023). Growing populations result in greater food demand, industrial interests, and overall water demand. Therefore, future generations have a stake in the sustainable use of groundwater as well. If environmental protection must be associated with human well-being, then there is an undeniable argument for the preservation of natural areas. However, there is also intrinsic value in treating the land respectfully, prioritizing ecological health, and viewing water as a sacred entity, not just a consumable resource.

Legal Strategies

No group understands that sense of stewardship better than indigenous peoples across the globe. In Aotearoa New Zealand, the Māori people successfully advocated for the Whanganui

River to be recognized as a person in the eyes of the law. It can now be represented in court and two guardians were appointed to speak on its behalf (Hollingsworth, 2020). In Māori legend, the Whanganui River was created when one of three mountains on the North Island travelled to the coast, splitting the land behind him (Young, n.d.). The cultural significance of land to indigenous groups underscores their influential role in advocating for environmental stewardship and warrants utmost respect for their perspectives.

In 2004 in Arizona, the Gila River Indian Community (GRIC) signed an agreement with the State that awarded them 650,000 acre-feet of water rights, making the group one of the largest rights holders of Colorado River water. With that responsibility, the community began to store some of the water underground, allowing it to seep into the depleted Gila Bend Groundwater Basin. In an interview with *The New Yorker*, GRIC Governor Stephen Roe Lewis said that "when we brought the water back, the plants that were literally asleep, started to germinate, started to grow again. It was almost like the land was healing itself on the banks of the river" (Monroe, 2023). Lewis said "I can feel my father, I can feel his spirit here. I can feel the spirit of our ancestors here" in reference to the revitalized land (Kestler-D'Amours and O'Toole, 2023). The aquifer recharge project has been a source of pride for this community, showcasing what can be achieved when this vital resource is respected. By acquiring the water rights from the State, GRIC has consistently placed the well-being of the land on an equal footing with that of their people.

In Eastern Arizona, on the southeastern edge of Black Mesa, the Hopi people live and tell of their place of emergence at the *sipapuni*. This geologic dome was created by mineral deposits from a spring along the banks of the Little Colorado River (Biggs, 2023). Executive Director of the Black Mesa Trust, Vernon Masayesva, has said that the *sipapuni* is seen as "the umbilical

cord to the Colorado Plateau and the heartbeat of Mother Earth" (Chief, 2020). However, this significance has been disrespected in historical legal battles. In the 1950s, the Hopi Tribal Council hired a lawyer, John Boyden, to fight an encroaching mining company, Peabody Coal. The council maintains that Boyden negotiated singlehandedly to clear the way for corporate interests. Based on their analysis of records unearthed by law students at the University of Colorado, they assert that Boyden was definitively "billing Peabody for expenses during the time when he was representing the Hopi in negotiations with Peabody Coal Co. for rights to Hopi coal" (Black Mesa Trust, n.d.).

While there is little evidence to back up that assertion, the University of Colorado Law investigation revealed a distinct lack of transparency during the deal negotiations. When Boyden presented the Peabody coal lease to the Hopi, "there [was] no indication that Boyden explained the magnitude of the operation and its probable impacts" (Wilkinson, 1996). Notably, he omitted that the two mines on Black Mesa would constitute the largest coal strip mining complex in the country. Moreover, the lease allowed Peabody to transport coal via slurry 273 miles to the processing plant, necessitating the withdrawal of 3,867 acre-feet of groundwater annually from the Navajo Aquifer. Despite its critical importance and scarcity in the region, water was never discussed during the meeting. During legal proceedings that aim to adjust previously allocated tribal water rights, profit goes hand in hand with agricultural and industrial interests. In the case of the Hopi people, a lawyer secured his payout by advancing an environmentally harmful yet lucrative mining deal.

In 1922, the Colorado River compact was enacted in hopes of "equitable division and apportionment of the use of the waters of the Colorado River System" (USBR, 1922). Yet the indigenous peoples whose land sits within the Colorado River Basin were excluded from the

conversation. The Compact allotted the consumption of 9.3 billion cubic meters of Colorado River water per year (USBR, 1922), which paved the way for major development along the river like the Hoover Dam. Not only that, but the Compact undermined the precedent of the Winters Doctrine, a 1908 mandate that ensured adequate water rights for reservations across the country. The doctrine stemmed from a legal conflict between the Gros Ventre and Assiniboine tribes and farmers regarding water rights to the Milk River in Montana. It was determined that Tribal water rights are inherent and were established at the inception of reservations themselves, thus superseding other claims of authority on these water bodies (Winters v. United States, 1908).

Nevertheless, the largest reservation in the United States continues to grapple with legal challenges in securing sufficient water supply. The Navajo Nation, spanning 17,544,500 acres at the intersection of Arizona, New Mexico, Colorado, and Utah, relies on tributaries of the Colorado River for its water needs. Due to the ongoing drought in the Southwest, the Navajo people face the same water scarcity problem as other citizens of these states. The difference is that historical injustices have resulted in Tribal members who "don't have piped water coming into their home, or safe water to even consume. They're economically depressed", said Heather Tanana, a professor at the University of Utah and citizen of the Navajo Nation (Kestler-D'Amours and O'Toole, 2023). The Navajo Nation sued the State of Arizona on the precedent of the Navajo Treaty of 1868 and Winters Doctrine in hopes of securing federal support for more water, adequate treatment systems, and distribution infrastructure. The Tribe's lawyers argued that the Navajo Nation's water rights are essentially held in trust by the United States. On June 22, 2023, the Supreme Court ruled that the Winters Doctrine does not impose a duty on the United States to secure water for the Tribe (Arizona v. Navajo Nation, 2023). The Tribe's lawyers noted that reading the treaties in this way means "that the United States promised the

Navajos a permanent home suitable for agriculture on lands that were practically valueless" (Kestler-D'Amours and O'Toole, 2023).

Conclusion

The research conducted by Langford and Russell (2017) on transboundary water governance holds particular significance in the context of aquifers spanning state lines and Native American reservations. Like the United Nations, the U.S. federal government will play a crucial role in establishing framework that ensures equitable division and behavior among American stakeholders. Agricultural and industry interests, conservation groups, and residents in indigenous, urban, and rural communities all vie against one another to secure adequate water supply. Homeowners in cities are presented with a convenient and crucial avenue to reduce their water consumption by converting lawns to native fauna. Big farming operations, like Riverview, have reaped the rewards of lenient groundwater regulations, leaving local farmers and residents to bear the brunt of depleted aquifers' adverse effects. In many of those cases, farming operations buy up the land of the citizens who can no longer afford to stay. Conservancy groups have also used land acquisition to advance their environmental protection objectives, in the name of both increased urban resiliency and land stewardship. Legal battles at federal and state levels also serve as a venue for promoting water interests, The disregard for the Winters Doctrine as legal precedent left Native Americans without essential federal support for drinking water needs, and it has demonstrated the indifference towards the spiritual significance of water in their cultures.

With that said, these inequities have been rectified through the very same systems that gave rise to them. The Peabody Energy strip mines in Black Mesa were decommissioned in 2019 due to economic impracticality. Now, the Hopi are repurposing and revitalizing that land

(Vanderpool, 2020). In 2026, the governing statutes on the usage and allocation of the Colorado River are expiring. The Biden Administration has reached an agreement with irrigation districts, cities, and Native American tribes in Arizona, California, and Nevada to temporarily withdraw less water from the Colorado River. The federal government is paying a total of $1.2 billion, equitably dispersed among these groups, for a 13% reduction in consumption of Colorado River water (Flavelle, 2023). Although the reduction payout may treat water as a commodity once again, it is necessary to replenish Southwestern aquifers in the long term.

Future federal governance must carefully weigh the downstream impacts of upstream actions on all social groups, recognizing the essential role of water in farmers' livelihoods, the cultural significance of land to indigenous communities, and the interconnectedness of urban resilience with natural systems. It should empower individuals to reduce water consumption and navigate the nuanced disparity between "the right to water" and "water rights". Legislative efforts must confront historical injustices in water distribution and reverse the commodification of water, as equitable distribution cannot be achieved by allocating the resource to the highest bidder. The United States can outpace the pressing challenges of drought and overuse, thereby safeguarding this essential resource both now and in the future.

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