The Efficiency Paradox

Why water conservation along the Colorado River — a much-vaunted silver bullet for the West’s coming era of shortage — could have devastating environmental costs.

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In 1937, Miguel Hernández Renteria left his hometown in the central Mexican state of Sinaloa and came to the Mexicali Valley, on the U.S. border, to grow cotton. The desert here receives less rain than the Sahara, and carving out a living with a horse-drawn plow was an act of faith as much as pitch. But Hernández proved tough enough to ultimately support 13 children.

Then, in 1946, he was confronted with a preposterous problem. Water began rising out of the ground and inundating his fields. By 1952, it was as high as his 7-year-old son Gerónimo’s neck.

The water was leaking out of the All-American Canal, just over the border. The canal carries nearly one-fifth of the water in the Colorado River to farms in California’s Imperial Valley. Because it was simply dug out of the earth and never lined with concrete, it leaks 22 billion gallons of water a year. That water percolates underground, migrates south across the border, and re-emerges in the Mexicali Valley.

Farmers here quickly turned the improbable seepage into a windfall. With the aid of the Mexican government, they built their own canal to capture much of the leakage, which is now funneled to farms close by. Private and government pumps also send the leaked water to farms, such as the Hernández.

Today, Gerónimo Hernández, at 61, is a tornado of a man who seems to have inherited his father’s tenacity. He also has a wicked wit, introducing himself with a reference to his namesake — “el pistolero de Chihuahua” — and a motion for a visitor’s scalp. “My father and the first generation of farmers are dead now,” says Hernández. “Horse-drawn plows have given way to mechanized cotton harvesters. But he and his brother still farm 400 acres along the border, rich fields punctuated by date palms that give the area a vaguely Mesopotamian feel.

The Hernández brothers are just two of more than 14,000 farmers in the Mexicali Valley.

Now, however, San Diego and the Imperial Irrigation District are about to begin a joint effort to remove the All-American Canal from service and replace it with a new one, excavated alongside the existing one and lined with concrete to make it impervious to seepage. Then the conserved water — the windfall that has sustained the farmers here for more than half a century — will be transferred to San Diego.

The Hernándezes and other farmers here stand at the edge of an advancing campaign of water efficiency that reaches across the entire Colorado River Basin. Nearly a century ago, the wild and undammed Colorado was, in the eyes of American engineers, a pestering child for inefficiency and waste. In the 1920s, they embarked on a campaign of maximum development and tamed the river with a phalanx of dams to keep its water from running wasted to the sea. Now, in a world shaped by ever-sharpening competition for water — and nearly eight years into a drought — the promise of efficiency has been resurrected.

Water efficiency bears a patina of environmental respectability, and it is frequently seen as a way to conserve more water out of thin air. But a profound paradox stands at the heart of the logic of efficiency. Increased efficiency creates losers as well as winners, and the victims often inhabit places far beyond the public eye. Gerónimo Hernández and his Mexican compatriots will soon find themselves among the losers. But the biggest costs of the new obsession with efficiency could ultimately accrue to the very place that bore the brunt of the first round of development: the foaming ecosystem of the Colorado River Delta.

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Paradigm

from the river, the agencies knew that a water crunch was imminent. In 1982, in response to severe drought, the Metropolitan Water District’s Canal System canal, freeman, (g@s). By 1980, the district’s canal system, freem,
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The Delta cannot conceivably be restored unless the seven Colorado River states in the U.S. control 95 percent of the water in the river, lift a dam to help. There is a clear logical link between the United States and the Delta. The river in Mexico precludes crucial habitat both for birds that annually protect as endangered in the U.S., and for migratory birds that wade their way on the Pacific Flyway into what the farmers along the border refer to as Gringolandia. The U.S. federal government has, however, consistently refused to join Mexico in the cooperation to which they run the river. They have, in effect, built dams that greatly externalized the environmental costs of their calculations. In 2005, for example, California, Nevada and Arizona signed what they hailed as a landmark Multi-Species Conservation Program for the Lower Colorado River, designed to protect endangered species while allowing those diminishing remaining water out of the river. The Delta is conspicuously absent from the plan. Now, the drought on the Colorado is driving water levels down to the lowest level in a year. The seven states are urgently finalizing a plan to prepare for the catastrophic shortages that will come with a prolonged drought. But expansion of science climate researchers have found evidence of in the not-so-distant past. From synchro-

up the operation of Hoover and Glen Canyon Dams to meet water demand more efficiently, to building a new “Drop 2” reservoir in the Imperial Valley to catch inadvertent “overdeliveries” and flush floods that otherwise would escape down the river to Mexico, the states are turning their collective weight toward ironing out last efficiency in the river with an ominous sense since the original dam-building campaign. It is hard to believe that there’s much left to iron out. Today, about 20 miles below Morro Dam, where Mexican ophites the majority of its share of Colorado River water to the Mexicali Valley, the river is literally as dry as dust. Yet and further downstream, in a no-man’s land of marginal farms that the Mexican government ordered despopulated in 1976 and is slowly being reclaimed by the desert, the river, amazingly, re-emerges. The vast majority of the Mexicali Valley drains to the Colorado River; and, somewhere out between the confluence of the Colorado and the smaller valley, reed-lined drainage canals gater the water that has run off the area’s farm fields. Like some mystical essence of the universe revealing itself, this is Julio Navarros’s petrified des a apu – water that has leaked from the valley’s irrigation network, but has not been truly lost. The drams emerge to form the Rio-Hardy, a short tributary that returns water to the very bottom of the Colorado River watershed and to the Delta. Much more water drainage remains unseen, in the form of perennials on the groundwater that lies just below the surface, where plants can tap it with their roots. By the standard calculations of the Colorado River-Mexicali Program, the water that makes its way back here is the most traceable to the river’s total flow. But it can be quantified in another extremely important way. It is enough to sustain life. Today, even though they are choked with tamarisk, the Delta’s laguneros are secret worlds full of home, pelicans and cranes. The place feels like the world after humans are done with it, but not the world left over. It is filled with the birds, and the sound of the wind, and crowned by an infinite expanse of sky. Few people know the Delta better than Francisco Zumaro, who works for the Tucson, Ariz.-based Sonoran Institute and manages its Delta restoration program. Zumaro has a habit of making himself look small under his ball cap, but his mind is constantly at work piecing out the engineering of the Delta. His group is now partners into a pilot restoration project on the river, an effort largely focused on re-establishing cottonwood, willows and mesquite in areas overtaken by tamarisk. But the main need now, says Zumaro, is water. The behavior of the entire hydrologic cycle in the Delta — how water takes taken out of the Colorado at Morro Dam, how it flows through the irrigation district, and the ways in which it returns to the Delta — is poorly understood. As a nonprofit, Zumaro says, “We haven’t been able to get all the resources we need to tackle those questions. But he is working on it. Zumaro has dialed up numbers from the National Water Commission, sought money to install stream gauges to quantitatively how much water stays in the Delta through, and scrunpped up $70,000 so scientists at the Autonomous University of Baja California can pursue the research. University of Arizona can construct a computerized hydrologic model to tease out the intricacies of flow patterns. It is an effort that would normally cost close to a half mil- 

lions dollars.

Wastewater flows into the Delta are now, at most, 2 cubic meters per second — far from the flows that can sustain a healthy river’s long-term annual average. Flow. Zumaro is trying to scale months. And he has possibly found it, or at least know where it might be. Zumaro is trying to get the city of Mexicali to agree to “debat” the outflow from a new wastewater treatment plant to the Delta, rather than selling the treated water for re-use in Mexicali. But working closely with Deed Hintzoxa and the Mexican conservation group Pronatura, he has also identified nearly 15,000 acres of farmland in the Mexicali Valley that could be bought or leased to increase more water for the Delta. Last year, Hintzoxa found the money — in a somewhat partnerships from groundwater that lies just below the surface, where plants can tap it with their roots. By the standard calculations of the Colorado River-Mexicali Program, the water that makes its way back here is the most traceable to the river’s total flow. But it can be quantified in another extremely important way. It is enough to sustain life. Today, even though they are choked with tamarisk, the Delta’s laguneros are secret worlds full of home, pelicans and cranes. The place feels like the world after humans are done with it, but not the world left over. It is filled with the birds, and the sound of the wind, and crowned by an infinite expanse of sky. Few people know the Delta better than Francisco Zumaro, who works for the Tucson, Ariz.-based Sonoran Institute and manages its Delta restoration program. Zumaro has a habit of making himself look small under his ball cap, but his mind is constantly at work piecing out the engineering of the Delta. His group is now partners into a pilot restoration project on the river, an effort largely focused on re-establishing cottonwood, willows and mesquite in areas overtaken by tamarisk. But the main need now, says Zumaro, is water. The behavior of the entire hydrologic cycle in the Delta — how water takes taken out of the Colorado at Morro Dam, how it flows through the irrigation district, and the ways in which it returns to the Delta — is poorly understood. As a nonprofit, Zumaro says, “We haven’t been able to get all the resources we need to tackle those questions. But he is working on it. Zumaro has dialed up numbers from the National Water Commission, sought money to install stream gauges to quantitatively how much water stays in the Delta through, and scrunpped up $70,000 so scientists at the Autonomous University of Baja California can pursue the research. University of Arizona can construct a computerized hydrologic model to tease out the intricacies of flow patterns. It is an effort that would normally cost close to a half mil- 

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