

Study: Effectiveness of program that pays farmers to conserve water

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Plots of land in Finney County, Kansas, utilize irrigation water from the High Plains Aquifer. Credit: NASA.

Crops need water. And in the central United States, the increasing scarcity of water resources is becoming a threat to the nation's food production.

Tsvetan Tsvetanov, assistant professor of economics at the University of Kansas, has analyzed a pilot program intended to conserve [water](#) in the agriculture-dependent region. His article "The Effectiveness of a Water Right Retirement Program at Conserving Water," co-written with fellow KU economics professor Dietrich Earnhart, is published in the current issue of Land Economics.

"Residential water use is mostly problematic in California, and not so much here in Kansas. However, people don't realize that residential use is tiny compared to agricultural use," Tsvetanov said.

"I don't want to discourage efforts to conserve water use among residential households. But if we want to really make a difference, it's the agricultural sector that needs to change its practices."

That's the impetus behind the Kansas Water Right Transition Assistance Program (WTAP).

"If you're a farmer, you need water to irrigate. If you don't irrigate, you don't get to sell your crops, and you lose money. So the state says if you reduce the amount of water you use, it's actually going to pay you. So it's essentially compensating you to irrigate less," he said.

But this is not a day-to-day solution. The state recompenses farmers to permanently retire their water rights. The five-year pilot program that began in 2008 offers up to \$2,000 for every acre-foot retired.

This benefits the High Plains Aquifer, the world's largest freshwater aquifer system, which is located beneath much of the Great Plains.

Around 21 million acre-feet of water is withdrawn from this system, primarily for agricultural purposes.

Tsvetanov and Earnhart's work distinguishes the effectiveness between two target areas: creek sub-basins and high-priority areas. Their study (which is the first to directly estimate the effects of water right retirement) found WTAP resulted in no reduction of usage in the creek areas but substantial reduction in the high-priority areas.

"Our first thought was, "That's not what we expected," Tsvetanov said.

"The creeks are the geographic majority of what's being covered by the policy. The high-priority areas are called that for a reason—they've been struggling for many years. Our best guess is that farmers there were more primed to respond to the policy because there is awareness things are not looking good, and something needs to be done. So as soon as a policy became available which compensated them for the reduction of water use, they were quicker to take advantage of it."

Of the eight states sitting atop the High Plains Aquifer, Texas is the worst in terms of water depletion volume. However, Kansas suffers from the fastest rate of depletion during the past half-century.

"Things are quite dire," Tsvetanov said. "The western part of Kansas is more arid, so they don't get as much precipitation as we do here in the east. Something needs to change in the long run, and this is just the first step."

Tsvetanov initially was studying solar adoption while doing his postdoctoral work at Yale University in Connecticut. When visiting KU for a job interview, he assumed the sunny quality of the Wheat State would be a great fit for his research. He soon realized that few policies incentivized the adoption of solar.

"At that point, I thought, "I can't really adapt solar research to the state of Kansas because there's not much going on here." And then I started getting more interested in water scarcity because this truly is a big local issue," he said.

A native of Bulgaria who was raised in India (as a member of a diplomat's family), Tsvetanov is now in his fifth year at KU. He studies energy and environmental economics, specifically how individual household choices factor into energy efficiency and renewable resources.

The state of Kansas spent \$2.9 million in the half decade that the WTAP [pilot program](#) ran. Roughly 6,000 acre-feet of water rights were permanently retired.

"Maybe it's a start, but it's not something you would expect to stabilize the depletion," Tsvetanov said. "This is just a drop in the bucket. Essentially what we need is some alternative source of income for those people living out there, aside from irrigation-intensive agriculture."

More information: Tsvetan Tsvetanov et al. The Effectiveness of a Water Right Retirement Program at Conserving Water, *Land Economics* (2020). [DOI: 10.3368/le.96.1.56](https://doi.org/10.3368/le.96.1.56)

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