

## Agricultural Water Use: From Cost Center to Strategic Asset



Water is no longer a passive input to agriculture. It is rapidly becoming a binding constraint on productivity, profitability, and long-term enterprise value.

In the United States, agriculture is the single largest user of freshwater, accounting for well over 80% of consumptive withdrawals in many regions. Irrigation alone represents nearly half of total freshwater withdrawals nationwide, yet irrigated land comprises less than 20% of harvested cropland while generating more than 50% of total crop value. That imbalance tells a critical story: water efficiency is directly correlated with economic output.

The challenge is not demand, global food systems will continue to scale, but efficiency. Current irrigation efficiency across U.S. agriculture averages approximately 60–70%, meaning nearly one-third of applied water never reaches the crop root zone. At the same time, major aquifers are being depleted at rates materially exceeding natural recharge. In capital allocation terms, this is an unsustainable drawdown of a finite asset with no viable substitute.

From a strategic standpoint, water is moving from an operational consideration to a systemic risk factor. Climate volatility, groundwater depletion, regulatory tightening, and competing municipal and industrial demand are converging into a single pressure point. The implication is clear: agricultural water use is no longer just an agronomic issue, it is a balance-sheet issue.

## **The Economic Signal Is Already There**

Consider the embedded water intensity of common commodities. Beef production requires nearly 1,850 gallons of water per pound. Rice consumes approximately 650 gallons per pound. Coffee exceeds 2,500 gallons per pound. When aggregated globally, agriculture uses an estimated two quadrillion gallons of water annually.

As scarcity increases, water pricing, explicit or implicit, will follow. Whether through regulation, allocation caps, energy costs associated with pumping, or infrastructure investment requirements, the marginal cost of water is rising. Producers who fail to adapt will see margin compression. Those who invest early in efficiency will capture structural advantage.

This dynamic mirrors historical transitions in energy, logistics, and labor productivity. Water is simply the next input to be optimized.

## **Efficiency Is the New Yield**

The industry has already demonstrated that progress is achievable. Over the last four decades, average irrigation application rates per acre have declined materially due to improved technologies and better management practices. Pressurized irrigation systems, including sprinkler and drip applications, now dominate acreage that was historically flood irrigated. Soil moisture monitoring, variable-rate irrigation, and sensor-driven scheduling are enabling precision water deployment rather than blanket application.

Equally important are soil-centric strategies. Cover crops, reduced tillage, and regenerative practices materially increase soil water-holding capacity, reduce runoff, and improve drought resilience. In effect, healthy soil becomes distributed water storage embedded directly in the production system.

From a return-on-investment perspective, these practices consistently outperform traditional capex. Reduced water use lowers pumping and energy costs, stabilizes yields during weather volatility, and extends the productive life of farmland assets.

## **Infrastructure Is the Multiplier**

Despite technological progress at the field level, water losses upstream remain significant. Aging conveyance systems, unlined canals, and inefficient delivery networks leak value, literally, before water ever reaches the farm gate.

This represents one of the most undercapitalized infrastructure opportunities in the agricultural economy. Modernization of irrigation districts, on-farm storage, reuse systems, and digital water accounting platforms offers scalable impact with measurable returns. Water infrastructure is no longer a public-sector obligation alone; it is an investable asset class aligned with long-duration demand.

## **Why This Matters Beyond Agriculture**

Water scarcity is not an isolated rural issue. It is a supply-chain issue, a food security issue, and increasingly a geopolitical one. By 2070, roughly half of U.S. freshwater basins are projected to face monthly supply shortfalls.

For ag-adjacent businesses, utilities, processors, lenders, and investors, water risk is embedded across the value chain. The winners will be those who treat water as a strategic input, measured, managed, optimized, and protected, rather than an assumed entitlement.

### **The Strategic Imperative**

The path forward is not about using less water at the expense of output. It is about producing more economic value per unit of water deployed. That shift requires capital discipline, data transparency, infrastructure modernization, and alignment between producers, regulators, and capital providers.

Water will define the next phase of agricultural competitiveness. The question is not whether the industry will adapt, but who will lead, and who will be forced to follow.

***This is the tenth in a series of posts on Green Tech Infrastructure.***

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*Author: William McCaughey*

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