

H2Own: Water Ethic and an Equitable Market for the Exchange of Individual Water Efficiency Credits

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As Aldo Leopold stated long ago and we have seen more recently with the success of Individual Transferable Quotas (ITQs) in fisheries management, vesting ordinary citizens with “ownership” of natural resources leads people to conserve them. By securing equitable shares of water and allowing everyone to trade what they save, innovative technology and the concept of H2Ownership can unlock equitable and competitive markets to effectively harness individual greed to create a widespread incentivized race to conserve, and a Leopoldian understanding and communal ethic about where the water comes from, how it is used, and where it goes. *Part of our Trading Water series.*

Trading Water

This article is one of a three part series on water trading. Never mind the stale public vs. private water services debate. Moving beyond the era of natural monopolies, here's a hard look at the more vital past, present and future (or culture, economics and politics) of individually tradable rights to water. See also:

[H2Ownership: Ancient, Equitable Traditions of Efficient Water Resource Trading in Desert Cultures](#) by

James G. Workman

[Water Rights and Human Rights: The Poor Will Not Need Our Charity if We Need Their Water](#) by

David Zetland

The Rationale for H2Ownership

Former U.S. President George W. Bush may have precious little in common with the visionary conservationist Aldo Leopold, but they did share a strong belief in an “ownership society.” For Bush, ownership was an end in and of itself, and his agenda comprised a hesitant attempt at privatizing social security accounts. But for Leopold, a man deeply in tune with the natural capital of the living world, ownership was a means to an end; it meant understanding the ecological limits and risks in using the precious resources on which humans depend. “There are two spiritual dangers of not owning a farm,” Leopold famously warned. “One is the danger of supposing that breakfast comes from the grocery, and the other that heat comes from the furnace.”

A farm owner, Leopold tracked food and energy to their literal roots, planting gardens and harvesting oaks to become a more responsible steward, thereby protecting and restoring the landscape as a consequence of his land title. Today, given that all food and energy trace their existence to water and an escalating water crisis is closing in on half of the world's population, he might well have added that the biggest danger in not owning a well lies in “supposing water comes from that faucet, that toilet tank, that pipe in the wall.”

Of course, most of us would rather not own and pump our own well. We live in a complex, fast-moving, interdependent urban economy with specialized divisions of labor that cater to our every desire. That won't change. And yet relying on faceless institutional monopolies to rent or give us water brings inherent risks. When we outsource our sustenance to strangers, we take it for granted. As Leopold noted, we will - all too often - tend to neglect, abuse and waste whatever resources we don't own. The absence of any clear and practical 'water ownership' whether defined as a right, an entitlement or a credit, is having devastating consequences for unraveling nature and undermining civilization – consequences that this article proposes to address and reverse.

The H2Ownership Vacuum

...what if water efficiency and resource conservation could be brought about through tapping basic instincts?

Today's headlines scream that some 2.3 billion people from New Delhi to Las Vegas have crossed the threshold of scarce water. Due to climate change, it is estimated that – in four decades – seven billion humans will face water shortages. More restrained organizations such as the United Nations and the World Bank have concluded that the problems facing the water sector clearly indicate that the era of plenty has ended and the era of scarcity has begun, locally, nationally, and globally. And contrary to the prediction of economic theory that resource use efficiency improves with scarcity, water use is becoming less and less efficient even as water grows [\[1\]](#).

In face of this tsunami of dire warnings and shortages, water managers around the globe have implemented a myriad of ploys to encourage conservation and reduce demand. They have tried logic, fear, guilt, shame, lust, and – in some parts of the world – even song and dance. Some of these solutions have worked for a few days; others longer. Many have not worked at all. Regardless of their measure of success and duration, most of these well-intentioned initiatives only last until the next rains fall when – umbrella in hand – everyone assumes that they can go back to their old comfortable water wasteful habits.

Such centralized efforts fall short because they direct ordinary citizens to leave integrated water resource management to the trained professionals and, in the rare occasions when such do try to enlist end users as agents of change, they try to alter human nature. Agencies seek to improve or even reverse the animal spirits of our selfish behavior. The twentieth century is littered with examples of how such efforts have failed in sectors from finance to farming.

But what if water efficiency and resource conservation could be brought about through tapping basic instincts? What if water managers – to reduce demand – harnessed the one resource in infinite supply: human greed?

H2Ownership Models and Theory

Sound radical? Actually this general construct has proven valuable in conserving another common aquatic resource: the ocean. There the tragedy of the commons led fishermen on a competitive race to the bottom. The FAO recently reported that 80 per cent of all fisheries have been fully exploited or overexploited. The only reason many harvests have leveled off is that humans have taken all the fish we possibly can. Enter an instrument called Individual Transferable Quotas (ITQs). First implemented in New Zealand, and now found in Australia, Iceland, Canada and the United States, ITQs vest members of a fishery with defined and divestible rights to a percentage of each catch. These quotas can be fished, bought, sold, leased or saved. As long-term owners rather than short-term renters, fishermen can look ahead, strategize on how to grow their asset, and fight for tougher and more innovative forms of conservation.

Prior to ITQs, fishery conservation officials had to resort to classic, increasingly restrictive command and control measures: restricting access, rationing supply, limiting users, controlling development, increasing license fees, assigning specific equipment, and imposing time-limits on who could use how much, for how long, and where. These steps sound uncomfortably familiar to water conservation leaders, writ large. Atlanta has encouraged neighbors to report illegal pool-filling. Menlo Park is exploring limits on lawn size. Las Vegas fines residents who run water features at midday. Los Angeles restaurants that serve water to customers who do not request it are breaking the law, and car washing is fined without proper shut-off valves. Such measures are not only unenforceable and impractical; the concept of a “water police” is more than a little bit creepy.

There has to be a better way, perhaps an ITQ of water.

That potential construct – for what we'll call a behavioral anti-tragedy of the commons -- has been studied extensively outside of water by Dr. Elinor Ostrom, an American political scientist and 2009 Nobel Prize recipient. Considered one of the leading scholars in the study of common pool resources - namely forests, fisheries, oil fields, grazing lands, and irrigation systems - Ostrom's work emphasizes how humans interact with ecosystems to maintain long-term sustainable resource yields. Conducting field studies on the management of pasture by locals in Africa and irrigation systems management in villages of western Nepal, Ostrom observed interesting characteristics of successful community ecosystem management.

So what do Aldo Leopold, fisheries ITQs, and Dr. Ostrom's theories have to do with water? In each case, vesting ordinary citizens with “ownership” of natural resources led people to conserve them. By securing equitable shares of water, and allowing everyone to trade what they save, political systems can harness individual greed so that a communal “water ethic” can emerge for the benefit of humanity and the habitat in

which we live.

The Politics of H2Ownership

This assertion may seem to fly in the face of fiercely dueling political assumptions about the ethical nature and value of water. Right now, half the world calls on governments to secure public water delivery for poor people as a human right. The other half calls on governments to value water as an economic commodity to be traded among competing private interests. A successful political economy of water ownership would bind these rival sides together in a pragmatic and symbiotic relationship.

In laying the groundwork for this ethical and political reconciliation, Leopold is once again both prophetic and instructive:

An ethic, ecologically, is a limitation on freedom of action in the struggle for existence. An ethic, philosophically, is a differentiation of social from anti-social conduct. These are two definitions of one thing. The thing has its origin in the tendency of interdependent individuals or groups to evolve modes of cooperation. The ecologist calls these symbioses. Politics and economics are advanced symbioses in which the original free-for-all competition has been replaced, in part, by co-operative mechanisms with an ethical content [2].

Leopold showed how two distinct but equally important schools of thought had been talking past one another. Drawing on that rationale, and metaphor, this essay argues for a similar political confluence, in which free-for-all competition for water, a zero-sum game, can be replaced by win-win cooperation. Call it 'The Water Ethic.'

Stepping back from rival warring hydrocrats and politicians, the key is to note that rather than imposing a public or private ideology from above a rights-based Water Ethic can rise up from below. That durable and inclusive human right could take form and content, adapted to place, and among the thirsty who seek water security for themselves. Security lies in owning an equitable share of a vital resource that cannot be taken away, namely water. Economy lies in being able to trade unconsumed fractions of that share to less frugal and efficient users.

H2Ownership Precedents

The notion of trading defined property rights for cash in the context of water – akin to a cap and trade market structure -- is a novel approach to rate setting, but hardly original. In 1992, Collinge introduced the idea of water “coupons” whereby customers were allocated a set number of coupons for free each month, one coupon corresponding to a discount off of the “base price” for 100 cubic feet of water, the base price being equal to the estimated AIC [3]. The total number of coupons issued was to be equal the “sustainable yield” of water that the utility was able to produce each year. Each coupon was an entitlement that could be freely sold among utility customers; customers with low consumption might have an incentive to sell coupons for less than their face value since they would only be able to use 1 coupon per 100 cubic feet of water that appeared on their bill. The customer could affix, literally glue, a coupon to their water bill, and the face value of the coupons' discount would be taken off of their bill.

Collinge preferred that the coupons be distributed evenly among all customers on equity grounds, and called this system the “Water Entitlement Transfer System” (WETS). If a customer consumed less than her allotment of coupons, then the utility would automatically “sell” the excess coupons to customers who wanted more than their share.

So why didn't his suggested approach take off? Like Leopold, he may have simply been ahead of his time. When the paper was written in the early 1990s, most Americans were only discovering email. Amazon was better known as a rainforest and river, eBay did not exist, and Facebook and Twitter were 15 years away. It is no wonder Collinge conceded that transaction costs would be a significant drag on implementing such a scheme.

Today, however, the Internet and social media have made it possible to track and own virtual credits of the potable water that flows through an individual meter or connection each day.

Your Very H2Own Web 2.0 Mechanism

To test this hypothesis that the time is ripe for a web-enabled H2Ownership solution, SmartMarketsSM has launched a platform to trade equal water efficiency credits, called EcoSharesSM: if people use up their daily allocation of EcoShares, they owe nothing; if they use more, they pay more. But if they are frugal and efficient and find ways to use less, they can save, bank, accumulate, donate or sell their EcoShares with more profligate users elsewhere in the same utility. The result is a widespread incentivized race to conserve, and a Leopoldian understanding and care about where the water they own comes from, how it is used, and where it goes.

"The concept of H2Ownership may stir some debate, which is both healthy and welcome."

Capitalizing on the convergence of three market drivers: ecommerce, social networks, and the green movement, SmartMarkets unlocks new and democratic markets within districts' or utilities' current unnatural monopolies. The venture's web 2.0 platform, AquaJust, can offer communities and utilities another tool in their efforts to balance equity and efficiency, encourage climate change resilience throughout the state, unleash innovation in the water sector, reward the austere, empower the poor and reduce water and energy waste by all end users – making citizens symbiotic partners infused with a true "Water Ethic" rather than antagonists when it comes to rate increases, flow restoration and watershed protection.

While smart meters and smart districts provide the "how" and "when and where" to an intelligent water utility system, SmartMarkets provides the "why" of incentives for consumer engagement. In fact, EcoShares could underpin a new blue economy – an ecosystem and viral community linking users' drip irrigation, lawn sprinklers, and taps back to the institutions, natural reservoirs and aquifers from which the water came. In essence, everyone can trace the water they own to their very own virtual well; the less they deplete, the more they earn.

As people become more closely connected with water and the watersheds that simultaneously provide their natural and financial capital, the emerging "Water Ethic" will continue to evolve and, as important, we foresee a market mechanism that capitalizes on human greed to drive positive conservation outcomes.

Ecopreneurial innovations such as SmartMarkets create new and potent incentives that motivate customers to consume less, and allow utilities to win more. Instead of a contentious 'utilities against consumers' ordeal, rate structure hearings will become a symbiotic process as both parties want their water operations to charge as much as possible for supply.

Why? Because SmartMarkets, subscribers would now own equitable credits for their water and customers want these units – EcoShares – to have high value as they save and trade their way to sustainability.

The concept of H2Ownership may stir some debate, which is both healthy and welcome. Let's grasp the opportunity to make clear the spiritual and economic threads that bind us to nature. Aldo Leopold surely would have approved; after all, he restored the Baraboo River habitat – the natural infrastructure that secured the supply of cool, clean water from which his family hand pumped in front of that iconic Sand County shack.

[1] R. Maria Saleth, *The Institutional Economics of Water: A Cross-Country Analysis of Institutions and Performance*, p. 57.

[2] Aldo Leopold. The Land Ethic, from *A Sand County Almanac*, 1948.

[3] Collinge, R. A. (1992), Revenue Neutral Water Conservation: Marginal Cost Pricing With Discount Coupons, *Water Resour. Res.*, 28(3), 617–622

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Research and Professional Interests

A graduate of Yale and Harvard, Mr. Simus has a lifelong interest in environmental and conservation issues, primarily as they relate to freshwater scarcity, renewable energy, and national park policy. Working from a water-scarce base in Las Vegas with his wife and son, he is the founder of [Water Politics](#), an organization dedicated to the identification and analysis of geopolitical water issues arising from the world's growing and vast water deficits, and is also a co-founder of [SmartMarkets](#), an eco-preneurial venture that applies web 2.0 technology and online social networking innovations to motivate energy and water conservation.