CHOICES
a publication of AAEA Agricultural & Applied Economics Association
The Magazine of Food, Farm and Resource Issues

3rd Quarter 2010 | 25(3)

THEME OVERVIEW: THE CHANGING NATURE OF AGRICULTURAL WATER ALLOCATION

Richard Howitt

In all regions of the United States, with the exception of the North East, water is a critical resource for agricultural productivity, environmental viability, and urban development. Over the past 70 years the growing pressures of water demand have been satisfied by the development of additional infrastructure for storage and distribution. Much of this infrastructure was publically financed, often with implicit or explicit subsidies. This supply system gave rise to an allocation system based on engineering efficiency and political patronage, thinly masked by cost-benefit analysis.

The ability to develop new supplies of water has been severely curtailed over the last two decades in nearly all regions by the interaction of three factors, namely the recognition of the environmental costs of water development, the dwindling supply of suitable water development sites, and the diminished political support for publically financed water infrastructure. The rise of the environmental movement led to the recognition that water was a central vector for many indices of environmental quality. This recognition shifted the political perception of water development from a positive sum game to a zero or negative sum game. This is not a new phenomenon, in 1906 John Muir protested in vain against the construction of a dam across the Hetch Hetchy Valley in Yosemite National Park to supply water for San Francisco. In addition to environmental problems, water infrastructure developers select the cheapest and most promising sites first. Thus, even when measured in the strictly physical terms of the ratio of cubic yards of soil and rock moved per acre foot of water stored, the remaining potential water storage sites are about one third as efficient as the earlier developments. When the increasing real costs of infrastructure development are factored in, the real cost of water storage and conveyance has increased dramatically over the past 60 years.

The rapidly rising real scarcity cost of water has been matched by an increase in demands for urban and environmental water. This increasing competition for water long critical to agricultural productivity has changed the standard response to water demand imbalance, from supply augmentation to a reallocation of existing supplies. Essentially, water has gone from a resource that was allocated by engineering efficiency and political expediency to a public commodity that has significant public good externalities associated with its storage, distribution, and use. This shift in the demand response method means that water allocations now have an important behavioral component that interacts with the physical component. In addition to the growing demands from urban and environmental users, climate change will very likely diminish the potential supply of developed water and the reliability of water supplies will also be reduced by a wider variation in climate.

The five articles presented here have the common theme of showing how the recognition of the influence of economic behavior, when combined with technical hydrology, can lead to more predictable policy results. The topics range from the adoption of urban conservation in arid climates, to counter-intuitive outcomes of subsidized technology on extensive high plains agriculture. They also examine ground water use and irrigation feedback loops, ethanol production impacts on water use and quality, and the implications for California agriculture of adapting to potential climate change.

Richard Howitt (howitt@primal.ucdavis.edu) is Professor and Chair Department of Agricultural and Resource

Economics, University of California Davis, Davis, California.