Linking Growth and Land Use to Water Supply (Land Lines Article)

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April 2003

Over the past several years, the Lincoln Institute has sponsored executive courses for state planning directors in the Northeast and in the West. In October 2002, more than 25 planning officials from 14 western states met in Portland, Oregon, to compare their experiences, learn from each other's successes and failures, and receive briefings, lectures and case presentations. A featured panel discussion during that course addressed "The Role of Water in Managing Growth." This article provides a brief review of alternative policy options to link land use and water supply, and offers some suggestions for further research, education and policy development.

During the summer of 2002, many Colorado communities imposed watering restrictions as historic drought gripped the state. Along Colorado's Front Range, from Fort Collins to Colorado Springs, officials are now contemplating the possibility of adopting a coordinated program to help homeowners understand when they can, and cannot, water (Smith 2002). At the same time, Governor Bill Owens and other state officials hope to work with the Bush administration to harvest more trees in Colorado's high-country in hopes of increasing water supply (Stein 2002). The basic idea behind this proposal, based on decades of study of state forests in Colorado, is that by removing around 40 percent of all trees in an area, the runoff from spring snowmelt can be increased significantly (Denver Post 2003). Such a proposal could change the face of Colorado for decades to come.

The situation in Colorado is symptomatic of urban areas throughout the Rocky Mountain West, one of the fastest growing regions in the country, and one of the driest. Finding sufficient water to meet the demands of burgeoning urban areas while also providing water for agricultural, commercial, recreational and environmental uses is one of the region's most challenging land use issues.

But water is not a problem only in the West. Communities from Florida to Massachusetts experienced some form of water rationing during the summer drought in 2002 (Snyder 2002). Frederick, Maryland, for example, has experienced a water supply crisis due to rapid growth and bad planning. After imposing a ban on new development, city officials approved an ordinance in September 2002 that will limit developers' access to water once Frederick moves beyond the immediate crisis and lifts the moratorium on construction. As further evidence of the growing need to link growth and land use with water supply, the Environmental Law Institute, the American Planning Association and other organizations cosponsored a conference in February 2003 titled Wet Growth: Should Water Law Control Land Use? It was cosponsored by and held at the Center for Land Resources at Chapman University School of Law in Orange, California.

Policy Options

Water and land are inseparable, yet the need to link growth with water supply in the process of making land use decisions appears to be a relatively recent phenomenon. A preliminary review suggests four prominent policy options to achieve this linkage.

Water Markets In their 2001 report, Water and Growth in Colorado, researchers at the University of Colorado's Natural Resources Law Center write, ". . . managing growth through water policy . . . is probably not an option worth considering." Their conclusion is based, at least in part, on two observations: abundant water supplies in the city of Pueblo have not spurred growth there, and a lack of water has not restricted development in the nation's fastest-growing region, Douglas County. The authors explain that a more compelling set of issues revolve around the impact of land use and growth on water resources. The increasing demand for municipal water use tends to deplete stream-flows and thereby degrade fisheries, recreational opportunities and other environmental values; increase water pollution; foster inter-state disputes; and increase the price of water. While these impacts are undeniable and create their own set of problems, they distract us from the question of whether, and to what degree, water supply can or should direct growth.

In the West, water is considered a private property right (Getches 1984). It can be separated from the land and may be bought and sold in the free market like any other commodity. In Colorado and other western states, it is common to hear people say, "water flows uphill toward money." This means that water is reallocated to where it is most highly valued (or to those who can pay the most), as illustrated by the trans-boundary system that diverts water from the western slope of Colorado across the Continental Divide to the metropolitan areas along the eastern slope. Under this legal and institutional system, it is quite common to transfer water rights from agriculture, which accounts for about 75 percent of water use in the West, to ever-expanding urban areas.

Water markets thus facilitate growth by acquiring the water necessary for land use and urban development (Anderson and Leal 2001). But what if a community or region is interested in managing growth to sustain some open space, wildlife corridors, and sufficient water flows for fish, recreational and other environmental values? How can water availability, or more accurately the lack of water, direct growth and land use into more desirable areas, thereby reducing conflicts with other community goals?

Public Trust Doctrine One way is to establish priorities for water use through the political process. Article II, Section 1, of Hawaii's constitution states, "All public natural resources are held in trust by the State for the benefit of the people." Article II, Section 7, says, "The State has an obligation to protect, control, and regulate the use of Hawaii's water resources for the benefit of its people." Section 7 goes on to say that the state's water resources agency shall "establish criteria for water use priorities while assuring appurtenant rights and existing correlative and riparian uses..." Interpreting these constitutional provisions, the Hawaii State Water Code clarifies that the state has both the authority and duty to preserve the rights of present and future generations in the waters of the state, and the state has a duty to take the public trust into account in the planning and allocation of water resources.

Hawaii's public trust doctrine is not uncommon; most western states have similar language in their constitutions (Sax 1993). Hawaii appears to be unique, however, in the degree to which it allocates water on the basis of the public trust doctrine. The state's water code declares that water should not only be allocated to domestic, agricultural, commercial and industrial uses, but also to protect traditional and customary Hawaiian rights, maintain ecological balance and scenic beauty, provide for fish and wildlife, and offer opportunities for public recreation. To achieve these purposes, the Commission on Water Resource Management is responsible

for developing a water plan that allocates water on the basis of "reasonable beneficial use," and for regulating water development and use (Derrickson et al. 2002).

In 1997, the Commission issued water use permits for agricultural and other out-of-stream uses on the Waiahole Ditch water system. The decision was appealed to the Hawaii Supreme Court, which overturned the Commission decision and ruled that the public trust doctrine and the state's water code provide that, at least in this case, in- stream public uses of water receive special consideration over off- stream private uses. This and similar applications of the public trust doctrine suggest that it is possible for appropriate jurisdictions to establish priorities for water use, and then to allow the market to reallocate water rights from one use to another consistent with the priorities established by law and the political process (Sax 1993).

"Prove-it" Policies Rather than rely on water markets, a public trust doctrine, or some combination of the two, several jurisdictions around the country have crafted policies that specifically require a link between water availability and development. According to the ordinance adopted in Frederick, Maryland, city officials will review every proposed development and decide whether the city can provide the necessary water. Under the ordinance, 45 percent of surplus water will be allocated for new residential developments, 30 percent for commercial and industrial projects, and 25 percent for other uses, including government buildings and hospitals.

Other states have adopted similar policies that require developers to prove that they have adequate water supplies prior to approving development proposals. According to Charles Unseld, the director of Colorado's Office of Smart Growth, several communities along Colorado's Front Range are imposing such restrictions, at least on an *ad hoc* basis. In October 2001, California Governor Gray Davis signed Senate Bill 221, which requires developers of proposals for subdivisions of 500 units or more to prove they have water rights before they can receive final approval. While this requirement can be avoided by building smaller developments, it nevertheless represents an incremental step in directing growth according to the availability of water.

Perhaps the most sweeping policy framework linking water supply to growth is Arizona's Groundwater Management Act. Groundwater sources supply roughly one-half of the total annual demand for water in Arizona (Jacobs and Holway, undated). Like most western states, agriculture accounts for about 70 percent of water use in Arizona, although this percent is slowly decreasing as municipal demand increases and the agricultural economy declines. In response to a growing concern over groundwater mining (that is, pumping and using groundwater at a rate faster than it can naturally replenish itself), the legislature passed the Groundwater Management Act (GMA) in 1980, and it was signed by then-Governor Bruce Babbitt.

The GMA created four "active management areas" (AMAs) around the state's most populous areas: Phoenix, Pinal, Prescott and Tucson; a fifth AMA was created in Santa Cruz in 1993. The primary intent of the GMA is to sustain a long-term balance between the amount of groundwater withdrawn in each management area and the amount of natural and artificial recharge. This is accomplished through a combination of mandatory water conservation requirements and incentives to augment existing supplies. To help achieve the goal of "safe yield," the GMA prevents new subdivisions from being approved in AMAs unless developers can prove that renewable water supplies are available for 100 years.

During a recent review of the GMA by a Governor's Commission, water managers in Arizona concluded that the "assured water supply" program is responsible for much of the substantial progress that has been made in fast-growing municipalities to move away from groundwater overdraft toward renewable water supplies, including water from the Colorado River and reuse of effluent.

Another potential policy mechanism to link growth and land use to water supply is the use of urban growth boundaries (UGBs). The statutes that authorize UGBs in Oregon do not currently single out water availability as a variable for determining where the boundary should be located. However, Ethan Seltzer, director of the Institute of Portland Metropolitan Studies at Portland State University, has commented that it is not inconceivable to create a UGB within which developers would be required to prove that water is available for proposed growth.

Water and Land Management Strategies In addition to asserting policies that explicitly link the availability of water supply to proposed development, there are other ways to meet the demand for more water to support development. Using existing water supplies more efficiently through conservation, xeriscaping and other water-saving measures can free up some water. Drought planning, water harvesting and the use of on-site gray-water systems can also help manage supply to meet demand. Groundwater development and the conjunctive use of surface water and groundwater may be appropriate for some communities. Small-scale and off-stream water storage, while potentially expensive and environmentally controversial, also could help some communities satisfy their thirst for growth.

Another option, mentioned earlier, is to increase water supply through timber harvesting and vegetation management. While some people debate the technical merits of this option, nearly everyone must question its political feasibility. During the past decade, conservation and environmental groups have consistently challenged timber harvesting practices on federal lands throughout the West, often tying-up much needed salvage logging and restoration projects for years in the courts.

The Search for a Land and Water Ethic

A recent issue of National Geographic reports, "Among the environmental specters confronting humanity in the 21st century-global warming, the destruction of rain forests, over-fishing of the oceans-a shortage of fresh water is at the top of the list ..." (Montaigne 2002). In the face of what the World Bank refers to as the "grim arithmetic of water," the author concludes that people around the world seem to emphasize two common approaches to this problem: efficient use of available water supplies, and a belief in using local solutions and free market incentives to emphasize conservation.

The relationship among water, growth and land use is a global problem that will be resolved most effectively at the local and regional level. While this article has reviewed several policy options, it is clear that there is much to be learned from other countries. More research, documentation and analysis of the effectiveness of alternative policies and practices are surely needed if the National Geographic story is correct: that limited water supplies are or will be the number-one environmental issue facing communities.

As we search for effective ways to integrate water, growth and land use, it is instructive to keep in mind the "land ethic" articulated by conservationist Aldo Leopold (1949, 224-225):

"A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise." The land ethic, according to Leopold, is based on the premise that the individual is a member of a community of interdependent parts. It provides moral direction on relationships between individuals and society and between humans and the biotic community, which includes soil, plants and animals, or collectively, land and water. This principle should inspire and guide us as we develop effective public policies to sustain communities and landscapes.

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