

# Denver Journal of International Law & Policy

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Volume 6  
Number 3 *Special Issue*  
*Water Needs for the Future*

Article 12

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January 1976

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### Recommended Citation

Gary Hart, Emerging Values in Water Resource Management, 6 Denv. J. Int'l L. & Pol'y 357 (1976).

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## Emerging Values in Water Resource Management

### Keywords

Water Law

## II. POLITICAL AND ECONOMIC

### Emerging Values in Water Resource Management

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I want to comment on an important phenomenon for consideration by people who are experts in resource management: that is, a national awareness just beginning to develop which recognizes that our natural resources are limited and must be intelligently allocated if they are going to serve the general welfare of this country. This is particularly true of those resources which are owned and managed by the federal government. It is also true of water.

The traditional exploitation of public resources for private gain is being replaced by a new emphasis on a stewardship of these resources for the public benefit. That water resources fall within the focus of this new awareness has put tremendous pressure on the traditional process under which water policies and priorities are determined. At the outset it must be remembered that water is a unique resource. It is self-renewing, like timber, but it is also a fixed and limited resource like a mineral in that once it is allocated for a specific use, it is almost always available only for that use.

In the western states the ordeal of questioning traditional assumptions, which is going on and must continue to go on, will be enhanced because the exploited character of water resources development will have to change dramatically. Development of water resources in the West has always been regarded as a critical component in economic development, and this has been magnified by the relative, and often extreme, scarcity of water throughout the western region. Western water resource development has grown through first simple then complex rules based on a doctrine of appropriative water rights and beneficial use, which have in turn justified some of civilization's most awesome technical undertakings designed to put water to use. Water has been the tool of economic development and often the

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key to that development. Economic growth under the old rules paid little attention to social and environmental values. As long as the principle objective of fostering economic growth was justified, water projects were deemed to be in the general welfare. And, with this justification came enormous amounts of federal financial and technical assistance.

Water projects, and of course other public works projects, were funded to satisfy what amounted to a circular demand to exploit available resources and promote economic growth. The basic equation for justifying water resource projects, both in general and with regard to specific projects, was the cost-benefit ratio. Balance sheets for developing this analysis were based on the old prerequisites for growth, quantifiable financial and economic factors, such as the initial capital outlays and the return on investments. Reliance on these quantifiable factors neglected assessment of non-quantifiable environmental and social considerations. These values have always been present, but our economic priorities, until recently, discounted them to the point where they were never really taken seriously. The emergence of new social and environmental values is forcing reevaluation of this whole equation, using concepts which are entirely different from those of water policy decisions in the past. But, because no formula incorporating these present values has emerged, in some cases the only avenue open to those questioning a specific water project is to totally oppose its construction.

Apart from the emerging resource management ethic, there are other variables which have come into the equation. There are increasing fiscal limitations on the economic efficiency and effectiveness of water projects. Competition for the federal dollar has, of course, intensified and will continue to do so, even more than we have seen in recent years. Water available for irrigation, the vast bulk of consumptive use, is beginning to reach its practical limits. New demands for water for urban growth, for recreational use, for water quality restoration, and for energy development are beginning to be strong competitors with traditional agricultural uses. One expert in resource management observed that "culmination of new environmental constraints and the relentless mathematics of exponential growth have brought us to the grim reality of physical shortage. In several regions, we are dividing up the last can-

teen." He continues to say that the essential character of water resource management in the future will not be the development of new supplies, but rather the more intensive management of relatively fixed supplies and reallocation of supplies among competitive uses.

And that is the point I am trying to make. Water resource management has shifted from the development of new supplies to this kind of prudent management of existing supplies and the allocation of these supplies among competing uses. Technological innovation must achieve the balance between the traditional demand that we are all familiar with and these new uses. The planning process that has served until recently will have to be overhauled; the planners and policy makers will have to reorder water priorities in their states and local regions to accommodate the new facts of resource life. As a part of this new focus, engineers and technicians must devise means to manage water resources more efficiently and effectively. They will be the ones who will present the alternatives to the politicians who have the ultimate responsibility to determine what needs must be met.

Competing pressures are manifest in this decisionmaking process. As a member of the Senate Public Works Committee, the pressures—as well as responsibilities to integrate the new resource management awareness into the development of a traditional resource—are evident to me. However, this responsibility has not been fully accepted. I think that those of us in the public arena have to acknowledge that. The old equations that I have mentioned still hold firm, and at the base of our application of those equations is the advice that those of us in the public arena get from those in the sciences and engineering. It is the responsibility of the engineer or of the scientist who is involved in the process of policymaking to provide the technical analysis of alternatives, not merely to say why or why not a particular project can or cannot be developed.

Alternatives are still available to us. We just have not focused on what those alternatives may be. Rather we have taken projects on an "up" or "down" basis as I have indicated. This is particularly the fault of the politicians who have not pressed for inclusion of other factors. The reason for this is simple: traditional water projects result in jobs and economic

stimulus for the home constituency. I believe this situation is changing.

Gradually, awareness by those in policymaking positions is moving us away from the traditional premises upon which projects were evaluated. The cost-benefit ratio is being dissected, not always by the politicians, but by interested individuals or organizations who are tuned into new and emerging values. As is too often the case, the people become aware of the changes that have to be made, but political judgment is slow to adapt to those changes.

Looking forward to the future of water resource management, development of new rules can only be accomplished by evaluating the multiple demands that are placed on this critical and increasingly limited resource. Demands obviously include traditional needs, but policymakers must also look to new needs such as recreation, fish and wildlife conservation, energy development, assertion of Indian water rights, and enhanced water quality. The technological skills of engineers and scientists will have to focus on meeting these demands. Water resource management will have to move away from a public works orientation to a more literal reclamation such as recycling, desalination, reducing losses from conveyance systems, and increasing the efficiency of water use in all regards.

But, maximizing water values cannot be achieved by new technology alone. It will find its ultimate solution in more sophisticated management at every level. And, as a result, the rule that we use to guide our decisions will also have to change. Ways must be found to adapt appropriate rights and beneficial use doctrines to multiple-use priorities; cost-benefit analyses will have to incorporate the unquantifiable variables I have already mentioned. The goals of water management will have to correspond to what is newly perceived as the public welfare. Procedures recently incorporated into the policymaking area require and demand broader public participation, a forum for the discussion of alternatives which will force politicians to take a more active role in changing the rules themselves. The pressure on political figures to come up with alternatives hand-in-hand with the scientists and technicians will lead to broader options to recognize new demands.

The old process for determining priorities for the use of water has become obsolete, and emerging public values support change. No longer will the decisions be made by a specialized few who base their decisions on outmoded concepts; the process has been opened up to integrate new concepts. To some the costs will be high. Sacred cows will undoubtedly be sacrificed. But this reassessment must come about if water resource management is to be brought in line with modern national goals.

