

KEYNOTE ADDRESS  
Western Water Resources:  
The Coming Problem  
and Policy Alternatives

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There is considerable nostalgia associated with keynoting this conference. It was just a quarter century ago that I was a member of the research department of the Federal Reserve Bank of Kansas City. Further, I was reared in Kansas and much of my professional work has been done in the West. No doubt Allen Kneese, also from Resources for the Future and who is on this morning's program, shares many of my emotions. Allen also once was employed by the research department of the Federal Reserve Bank of Kansas City but, I hasten to add, less than a quarter of a century ago. I am told that some of his writings on water and benefit-cost analysis, done while he was at the Bank, are still in print and are still being used. Thus, this is something of a homecoming for both of us.

But if homecomings are sentimental and heartwarming, they also can have their uncomfortable dimensions. And I have had some uncomfortable hours preparing these remarks. Your program is well planned to provide coverage of the major dimensions of water problems in the West, and it was difficult to imagine what I might say that would not be developed in greater depth by one or more of the other speakers. The problem was made even more formidable when I considered those who will follow me on the program. Much of what I know about economics and water has been taught to me by people such as Kenneth Boulding, Maurice Kelso, Frank Trelease, Del Gardner, Allen Kneese, and Charles Howe. One might think that I could take some comfort in the fact that one of my former students, Dan Bromley, is giving a major paper. After

all, a common impression is that former graduate students are disciples who spend their professional lives extending the teachings and extolling the wisdom of their major professors. While I do not wish to comment about the students of others, I must say it probably would be more hazardous for me to try to build a framework for my former students than for those from whom I have learned so much.

It is not difficult to document the many existing and emerging water problems in the West. People in this region are acutely aware of declining ground water levels, which have triggered major adjustments by individual water users as well as by communities. There is widespread knowledge that the energy resources of the region require substantial water if they are to be developed. And, as water usage becomes more intensive as well as extensive, the characteristics of water have been changed and quality problems are commonplace. These conditions and others are so familiar to this audience that it is unnecessary for me to convince you they are real.

Nor do I believe you will disagree when I say that we are having real difficulty in addressing these problems. The historic western response to solving water problems has been to develop more water. Basically, this means putting to human use more of the water provided by nature and involves building more dams, drilling more wells, and importing water from other areas. But the best sites have been developed, the water near the surface has been pumped, and nearby water-surplus areas already have been tapped. Even though water is becoming more valuable, the cost of water development has increased significantly even as federal investment in it has declined. In addition, we have become aware that water development often has significant effects on the environment that need to be considered before such development is undertaken.

One might expect that our capacity to direct water to its best use would improve as water becomes more valuable and as water development declines. While there is a difference of opinion among informed people, probably few would say that our legal and administrative institutions are ideal for dealing with the water problems before us. Most of these institutions came into existence when people wished to use cheap and abundant

water to develop an area. It was the function of one set of institutions to permit water to be developed, and it was the purpose of another set of institutions to keep the rights to water straight—to provide security in regard to the water that was developed. The re-allocation of water was not a major problem when water institutions came into existence, and perhaps it is not surprising that considerable variation now exists among the western states in the way this problem is addressed.

As water becomes more valuable in an economic sense, one would also expect the efficiency with which it is used to improve accordingly. Certainly this has been occurring in some instances. In the Ogallala aquifer region, for example, both an increase in the cost of energy and a greater lift have occurred with water pumped, and farmers have responded accordingly. But the increased economic value of water generally has not been reflected in user cost throughout the West, the amount of water required to provide a unit of goods, services, and satisfactions has changed but little, and the real value of water typically has not been reflected in individual decision making.

Thus, an outline of our existing and emerging water problem is easy to draw. Our economy is expanding and the need for water also is growing, probably not proportionately, but at least absolutely. Our capacity to respond to these new challenges seems to be less than we would like. Those who arranged this program recognized these conditions and obviously intended that in this conference we would attempt to identify ways of dealing with these difficulties. They have specifically requested that I give attention to efficiency and equity conflicts.

On the one hand, we know there are opportunities to make better use of water—it would be possible to produce just as much in many cases with less water, and it appears there are opportunities to shift water to higher-valued uses—but on the other hand, these adjustments often are not made. The conclusion usually is reached that equity and efficiency considerations are in conflict and are at the seat of the difficulty.

Economic efficiency is a reasonably well-understood concept. It has been defined rigorously by economists and we know a good bit about its measurement. But it is far more difficult to treat equity in a comparable fashion because there are some

philosophic contradictions that arise when we begin to use the term. For example, few believe it is "equitable" to ignore the needs of those who are unable to contribute to the creation of goods and services that all find useful. Yet short of complete dependence, there is tremendous individual variation in ability to produce. Is everyone who is capable of some contribution to be compensated strictly in accordance with that production? And how is that contribution to be valued? Further, what account will be taken, if any, of those factors that may influence productivity over which an individual has no control and that arise from the natural and social environment? Those who have experienced the simultaneous occurrence of a drought and depression in the Great Plains know what I am talking about.

Thus, equity is too illusive a concept to deal with directly. Rather, I have chosen a different approach and will attempt to identify fundamental aspirations of people in our society and to see whether water policies cause these aspirations to be in conflict or in harmony. If they are in conflict, adjustments will be necessary in what we are trying to accomplish. But if these basic aspirations are not in conflict—if instead the means chosen to realize those aspirations have become obsolete—then the problem is of a very different kind. I have chosen to get at the equity-efficiency question in this way.

Many years ago a philosopher named John Brewster traced the role of the principal values in America. He identified these principal values as (1) the work ethic, (2) the enterprise creed, (3) the creed of self-integrity, and (4) the democratic creed. The *work ethic* holds that if people worked proficiently and well, they would close the gap between their present circumstances and their aspirations. The *enterprise creed* implies that proprietors have the right to prescribe the working rules for their production units: the individual family is responsible for its own economic security, and the role of government is to prevent interference with proprietors to run their businesses as they see fit. The *creed of selfintegrity* provides for the right and obligation of the individual to dissent from generally held opinions, customs, and traditions. The *democratic creed* involves the judgment that all men are of equal worth and dignity, and that no man is wise enough or good enough to have dictatorial power over any other.

It was Brewster's thesis that at one time these values could be held simultaneously and in harmony. But he argued that the industrial revolution threw them into conflict, and he highlighted those conflicts in graphic terms by using agricultural problems in this country as an example. Brewster's analysis was based on a study of the writings of Thomas Jefferson, John Locke, and Adam Smith. Brewster and others have shown that the form of government and the type of economic organization adopted in this country were based on the philosophy of these writers.

It is no less useful to apply this kind of analysis to the resource development policies that have emerged in this country. Many of those policies were based on the thesis that the development of natural resources would create economic opportunity so that the values of the work ethic could be realized. Private rights in natural resources, until recently, have been quite consistent with the enterprise creed—that the private holder of rights should have considerable freedom in the way those rights would be exercised—and water law, as an example, has given the holder of water rights substantial security in their use. Such a system worked quite well so long as there was water to be developed, the federal government was investing in its development, and environmental effects could be ignored or easily internalized. These conditions have changed, but our policies and institutions have not changed accordingly. But enough of generalities. Let me now be specific with respect to the kinds of conflicts with which we must deal if we are to bring specific goals into harmony.

At the risk of oversimplification I would like to state what I believe to be the two fundamental problems pertaining to natural resource policy. First, a major problem in our society arises from a desire to provide for that combination of market and nonmarket activities that best serves our needs. This problem is often stated as the conflict between economic growth and environmental quality, and that is part—but only part—of a more basic conflict. On the one hand, the enterprise creed recognizes the power of private property and the profit motive in providing market goods and services. The "right" of the proprietor to run his business as he sees fit derives from the fundamental assumption that this will best serve a greater good. For many years we relied heavily upon relatively unregulated

markets to serve this greater good. A rising standard of living over a long period of time was evidence that the policy worked. If this now sounds quaint and old fashioned, let me call your attention to the August 27, 1979, issue of *Time*. One finds here a discussion of declining productivity in the United States and what it means. We are discovering that many social tensions have been alleviated historically because we had an economy that each year produced more on a per capita basis than it did the previous year. Even though we are a rich nation, concern about market goods and services is not out of style.

But there are many things we value that are not well produced by the unregulated market. Environmental quality is a major policy consideration for every resource today—energy, water, air, land, and food. The market, left alone, will not do a very good job of protecting the air we breathe or the waters that many of us would like to use in common. We have also decided that the market alone will not always provide adequately for the health and safety of workers. Further, the democratic creed and the creed of self integrity have led us to stipulate that economic opportunity will not be denied on the basis of race, color, creed, sex, and, increasingly, age. In addition, we have been unwilling to trust the market completely to provide either for basic research or the education of the populace.

It is my hope that this conference would not assume that the market economy and the enterprise creed are obsolete. But I would also hope that there will be general recognition that the market does not provide automatically for all of those things that are important to our society. There is a need to agree as to how the desired combination of market and nonmarket goods and services will be determined.

As difficult as it is to determine an acceptable combination of market and nonmarket goods and services, the **way** in which such decisions are made is also of great importance and is the second fundamental problem area in national resource policy. Thus, harmonizing individual and group decision making must be considered simultaneously with the question of what will be produced. Kenneth Boulding has said:

On the whole, political thought in the West has emphasized form: constitutions and procedures, who is to judge things rather than

what is to be done. Socialist thought has emphasized substance to the neglect of form, at least in the light of a particular ideology, with the result that socialist societies have found themselves defenseless against tyranny. Both form—who does it—and substance—what is to be done—are important, and we must give increasing attention to both if the next hundred years is not to be a disaster.'

The development of modern technology has made very large systems both possible and, for the private sector, profitable. Individual proprietorship has not been nearly as effective for many in closing the gap between reality and aspirations as working within a larger enterprise owned by others. Government policies designed specifically to assist small farms and small businesses have been ineffective in curbing this trend toward bigness. Government has grown larger, sometimes to deal with big business or big labor, but sometimes also just because certain kinds of technology have made larger government possible. For example, it is hard to imagine our social security system functioning as it now does in the absence of modern electronic technology.

But largeness in one dimension may involve a sacrifice in another dimension. A municipality may be better able to deliver varying quantities of good quality water to a large number of users and collect payment for this service than it is in designing an incentive system that will result in efficient use of that water. Large systems may do very well in supplying great quantities of an item of uniform quality, but they may have limitations in serving the needs of people where variation in consuming units must be taken into account or where quality of product is an important consideration. One reason large public sector systems may be less than satisfactory is that the public may expect too much. It is not enough that the Bureau of Reclamation provides water to agriculture and municipalities. It also must try to create opportunity in agriculture by establishing many small units on irrigation projects even though farm consolidation has been the trend in agriculture. While the "work ethic" is still a valid aspiration, the 160-acre farm probably is not a very good way to provide for its accomplishment.

The second major problem area, then, is deciding how to harmonize individual and group decision making. But the matter

does not end there. Once it is decided that group decision making is desired for the accomplishment of a particular goal, objective, or task, how is the group to be formed? How large will it be and how will it be made responsive to the needs of those who constitute the group?

In confronting the water problems of the West, I believe we must always keep in mind these two major dilemmas that confront all of resource policy. We will not be successful if we believe we must choose once and for all either between economic growth or environmental quality, on the one hand, or that we must choose, in a general sense, between individual prerogative and group need. But there must be procedures and guidelines for resolving conflicts in particular situations. In the time remaining I will identify four major guidelines for water policy in the West which will need to be observed if these two major problems are to be addressed.

1. Water policies of the future need to recognize the powerful role of *individual incentives*. Incentives affecting individual behavior are of many kinds, but many of the economic incentives imbedded in water policies are counterproductive to the objectives identified earlier. They enhance neither economic progress nor environmental quality. The underpricing of water may have made sense when the objective was to encourage the use of an abundant input to develop other resources—but that objective is long gone. There are many parallels between the pricing of water and energy, with the result of these policies generally being the same. There now seems to be a slowly growing recognition that the pricing of energy at less than its replacement cost will serve neither to provide an energy supply nor to protect environmental quality. Let us hope that a similar realism can be introduced into water policy.

Economic incentives, which grow out of the marketplace, also can be used to obtain those goods and services that typically are not produced by the market. Allen Kneese has done as much as anyone to call attention to the potential use of such economic incentives as effluent charges to bring about desired levels of environmental quality.

2. A second guideline is that future western water policies should focus attention on the critical importance of improve-



ments in *state water law*. Some water institutions may suffer from an advanced case of "institutional arthritis." Individuals knowledgeable about water law in the West differ as to whether the arthritis that afflicts state water law is crippling or only aggravating. My own belief is that the law in most states has the capacity to accommodate substantial change in water use but that there is much room for improvement.

Water law in the West can best serve those who now hold rights (as well as emerging water needs) if existing rights can be defined and quantified, if the extent of third-party interests can be specified, and if water rights can be transferred through the payment of compensation. This, of course, is a tall order, because water is a fugitive resource and third-party interests are very difficult to treat. But some states have done much better with these matters than others. One does not have to be an idealist to believe that a systematic comparison of what already exists might serve to bring about substantial improvements.

If the law permits rights to be identified and measured, and if rights can be transferred by the payment of compensation, many opportunities exist that would not otherwise be available. For example, the public could acquire, perhaps for in-stream purposes, rights that now divert water out of the stream. The transfer of rights would also permit new uses to be accommodated, such as energy development, but if a community wished to maintain, say, its agricultural base, rights might be acquired by a community or a group for that purpose. Communities acquire open space in urban areas and hold it free from commercial development. The acquisition of water rights would permit communities to control development in a comparable fashion.

3. A third area of emphasis for future western water policy is one that is already receiving considerable attention. This is the determination of the *appropriate role of government at various levels* in water programs and policy. No doubt subsequent speakers will refer to the declining role of the federal government in financing water development projects. This development has been stimulated in part by the recognition that not all of the benefits of such projects are national in

character and also by increased competition for the federal budget. But there are other reasons. I first became familiar with water policies in Oregon in the mid 1950s. The water policy of the state at that time consisted largely of efforts to make federal) water investment in Oregon as large as possible. Just as I left Oregon in the mid 1970s the state had decided it did not want a dam built that had already been authorized and for which funds had been appropriated by the Congress. By that time the water policy of the state required that federal investment be examined from several points of view. Such an examination resulted in the state saying "thanks, but no, thanks," even when a dam would have been built with all federal money. This kind of examination and change can be expected to continue.

There are several reasons this is occurring. It is partly due to renewed interest in resource management in general at the local and state level. Communities have discovered that land-use control is one of the few techniques available to them for the management of growth. But land-use planning often forces a look at all resources. More than one state has discovered inconsistencies between its land use plans and its water policies.

There also is the fundamental question as to which unit of government is best suited for certain tasks. The construction of a Grand Coulee or a Hoover Dam obviously requires the involvement of a very large unit of government. But if massive investment is not required, certain facets of water policy might better reside at a lower unit of government. It may well be that the capacity of the federal government to address truly large problems adequately is diminished if it assumes functions for which it is not well suited. Of course, there are advantages and limitations at all levels of government, and the matching of problems with the appropriate jurisdiction promises to be a major element of water policy for some time to come. Small is not necessarily beautiful, but neither is bigger necessarily better.

4. Group decision making or government intervention is undertaken for the purpose of improving on individual decision making or affecting individual decision making in some beneficial way. It was noted earlier that the market alone may not do a very good job of providing for environmental quality. It was also noted that one of the most basic problems faced by

our society involves selecting the appropriate mix of market and nonmarket goods and services. The output of markets can be modified and supplemented in a number of ways, including direct regulation, effluent charges, subsidies, a redefinition of property rights, and government ownership. Yet private performance may be very different depending on the method of government intervention chosen. *An important part of the cost of modifying market performance may be the cost and uncertainty of the rule itself: Accordingly, the fourth guideline is that a special effort should be made to reduce the uncertainty associated with group action affecting water policy.* Studies that I have seen suggest that the economic cost of achieving significant improvement in environmental quality may not be large if the cost of rule making, enforcement, and the additional uncertainty created by the intervention is not considered. Environmental goals and objectives need to be made explicit, and the means for achieving them need to be stabilized. Private sector decision making will respond to incentives and it will adjust to regulations. But if the ground rules are constantly changing, if regulations are applied in what appears to be a capricious manner, or if public sector decisions as to what is permissible are slow in coming or uncertain as to when they will be made, private sector performance is much hampered and environmental quality objectives are not necessarily enhanced in the process.

In summary then, it is accurate to say that this conference is timely, and that it is about an important subject. Water policy decisions during the coming decade will force us to consider how we are going to achieve some of our most fundamental goals. But it is hoped we will not opt for policies that will result in more polarization and in stalemate. Rather, we need to use our genius to develop approaches that will permit the simultaneous accomplishment of our deeply held values. The general choice must not be between economic growth and environmental quality. Rather, the appropriate policy is one that will permit us to choose a combination of market and nonmarket goods that is to our liking and chosen by means that will not damage us in the process. The choice need not be between extreme individualism and collective paralysis. Rather, the appropriate

policy is one that recognizes that certain problems require concerted action but that also tries to create an environment for individual decision making that will promote the common good.

### Notes

1. Kenneth Boulding. *Daedalus*, Fall 1973, pp. 100-101.