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A CRITIQUE OF THE NATIONAL WATER COMMISSION
ANALYSIS OF COST SHARING

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A Critique of the National Water Commission Analysis of Cost Sharing*

Chapter I -- Introduction

The approval of Public Law 90-515, "The National Water Commission Act," September 26, 1968, established the National Water Commission and spelled out its legislative mandate, which in sum was to study "...virtually all water problems, programs, and policies in the context of their relationship to the total environment, including 'esthetic values affecting the quality of life of the American people.'"[1/] The Commission began work in December of that year and in the intervening five years made three interim reports to the President, held a series of regional public meetings in early 1973 (which accommodated the views of some 351 witnesses), and accepted thousands of written statements from additional interested groups and individuals. Its final report was presented to the President and the Congress in June 1973, and contains recommendations for the improvement of policies, concerning the nation's water resources, which it believes will more optimally contribute to the welfare of American citizens. Among the many and varied topics addressed by the Water Commission in its report is the set of problems and issues attendant to the manner in which water development projects are currently financed. In its treatment of these so-called cost sharing policies, the Commission is critical of the present arrangements for sharing the expense of water projects among and between the different levels of government and those individuals and groups who benefit in varying degree from various types of projects. Its criticism is directed principally at the inconsistencies of such policies among programs, purposes and agencies, and the resulting confusion and patterns of development marked by distortion and deviation from principles of efficiency and equity.[2/] Central to the recommendations proferred on this matter is the theme that "...the identifiable beneficiaries of projects' services should bear appropriate shares of development and operating costs..."[3/]

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* Chapters 1 - 4 were prepared by William Hunt and David Allee, Chapter V includes the efforts especially of Edward Cohn but also Leonard Dworsky, Gene Reetz, Peter Willing and Peter Jutro as well as David Allee.

1/ National Water Commission. Water Policies for the Future -- Final Report to the President and the Congress of the United States by the National Water Commission (Washington, D. C.: U. S. Government Printing Office, June 1973), p. x.

2/ Ibid., pp. 485-499.

3/ Ibid., p. 497.

The discussion of this paper is an attempt to depict in broad perspective the role of cost sharing as an important major policy instrument in water resources. Such a broad view of any subject would certainly be incomplete without some attention to history. Chapter II attempts to place the issue of cost sharing in historical perspective, outlining the major roots of present policies and hopefully serving perhaps as a gentle reminder that the present, too, is history.

Chapter III briefly covers the National Water Commission recommendations, as well as debate on cost sharing as evidenced in the products of other major official study groups which have examined one or more facets of water policy in preceding years. The chapter is primarily conceptual in nature. The discussion attempts to cover major facets of the nature of the "process" of policy making, focusing particular attention on the "environment" within which this process takes place and within which decisions are made regarding public water resources issues. Using the Report of the National Water Commission as a starting point, discussion will cover apparent assumptions (or presumptions), embodied in the Report's cost sharing proposals, concerning the "environment" alluded to above, as they pertain to: principles of public administration, economic principles and their interface with the political environment, and the nature of intergovernmental relations in the context of a federal system. The ensuing discussion will provide a theoretical conceptualization of the decision making, policy making environment. The focus will be on constraints imposed by such realities as the institutional setting, the legal environment, political-economic behavior, and pertinent aspects of the intergovernmental relations indigenous to the federal system. Such realities, although very real and perhaps often the more important variables in policy issues, are also characterized by a degree of complexity that militates against their inclusion in models upon which policy recommendations of this kind seem often to be based.

In Chapter IV, the matter of cost sharing as a policy variable in water resources planning and development is explicitly addressed. Rather than to arrive at specific proposals, it is the aim of the discussion in this chapter to come to an intelligent, mature perception of the role of cost sharing as a major instrument of policy. The approach to this understanding involves an assessment of cost sharing strategies and philosophies, derived from some of the ideas presented in Chapter III and from informally conducted interviews in Washington, D. C. In addition, a number of cases are discussed in which the cost sharing matter is in some way a key issue. The cases include pertinent aspects of specific projects and selected legislation.

A complex mosaic of policy takes form as legislation is enacted, and signed into law, as precedent is established administratively and judicially, and as the mood and values of the public continually fluctuate. Cost sharing does not occupy an easily defined niche in this mosaic. As the National Water Commission has done well to point out,

> Present policies governing Federal and non-Federal cost sharing arrangements in the water resources field have been established over a long period of time by unrelated congressional

> actions on particular projects and programs and by similarly uncoordinated administrative determinations. As a result, these policies are now inconsistent among programs, among purposes, and among agencies. 4/

A number of major themes emerge from an investigation of this policy mix regarding goals to be attained through cost sharing strategies. Their identification helps to glean from the policy mosaic a broad understanding of water resources cost sharing policies -- what they do and what they are intended to do.

Chapter V recapitulates the major findings of the paper. After a summary of the major points in the body of the paper, some concluding comment is in order. To this end, discussion at this point turns to some recommendations. In keeping with the interest of pursuing this topic with the broad overview in mind, the recommendations do not merely set forth specific cost sharing proposals. They are concerned instead with the larger questions, generally, of how the subject of cost sharing policy should be approached to begin with, what role it should play, and to what extent can/should "analysis" be clearly differentiated from "value" statements.

The foregoing introductory comments outline the general structure of the paper. It would be helpful at this point to set forth some guide as to what ends this discussion is geared. The intent is multi-purpose, and some of the major items are enumerated below:

1. Enunciation of the major themes and issues in cost sharing.

2. Identification of the broad questions which ought to be addressed at the outset of any examination of cost sharing policies.

3. Understanding of the multi-faceted impact of cost sharing policy.

4. Appreciation for the complexities of the process of policy making in general, and specifically with respect to cost sharing.

5. Significance of policy considerations in the administrative and planning functions, with emphasis on cost sharing.

While this listing is neither exhaustive nor limiting, it hopefully gives a feel or "sense" of what this effort sets out to accomplish.

Throughout this paper, the historical section, the case examples, as well as the conceptual discussion, are all hoped to be illustrative of the manner in which policy changes come about in a complex socio-political-economic environment. Such an understanding contributes to making more meaningful proposals for which implementation and related matters are more carefully taken into consideration.

4/ Ibid., p. 485.

Chapter II -- The Historical Perspective

Introduction

> ...Present cost-sharing policies tempt Federal Water Project beneficiaries to request projects that they would not be willing to pay for if their own money were involved...
>
> Only by placing development of water projects for purposes that yield economic returns on a self-supporting basis can equity be promoted... The best way to do this is for the identifiable users of projects services ... to bear their proportional share of development and operating costs of the projects through systems of pricing or beneficiary charges such as special assessments, taxes, and fees. 5/ (National Water Commission, 1973).

> The just conclusion from all this is, that if the Nation refuses to make improvements of the more general kind, because their benefits may be somewhat local, a State may, for the same reason, refuse to make an improvement of the more local kind, because its benefits may be somewhat general ... But suppose, after all, there should be some degree of inequality: inequality is certainly never to be embraced for its own sake; but is every good thing to be discarded which may be inseparably connected with some degree of it? If so, we must discard all government... 6/ (Abraham Lincoln, 1848).

The issue of who should bear the costs of water development programs and projects is both timely and timeless, as it has its roots in the very beginnings of the nation, while being the subject of debate today as well. The question is unlikely to be ever fully answered, and lies ultimately at the heart of the purpose of government itself. The aim of the following discussion is much more modest, as it attempts to highlight an appreciation for the historical flavor, and its significance to this topic. Few would argue over the notion that as events unfold over time, their interrelationships and causal linkages contribute to make the historical process a kind of continuum leading up to the present. The point is that the activities of the present, although unique in that they are happening now, are just as much a part of history as are the events of some obscure past. Nonetheless, prescriptions for major policy changes seem often to overlook this point, as they paint a picture of a vague and comfortable future, in which the recommended changes are working to the betterment of all. In its 1973 report, the National Water Commission mentions the historical aspect of the development of policy, but

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5/ Ibid., p. 495.

6/ William J. Hull and Robert W. Hull. The Origin and Development of the Waterways Policy of the United States (Washington, D. C.: National Waterways Conference, Inc., 1967), p. 20.

seems to see it mainly as an aggravating element, which produces inconsistencies "...among programs, among purposes, and among agencies."[7/] The Commission's criticism of the present inconsistencies can perhaps be viewed as part of a long term trend towards a more uniform, rational body of water resources policies. For an understanding of this inconsistent nature, it is instructive to consider first the roots of resource use policy in general.

Origins of Resource Policies

The earliest policies which effectively began to set precedence developed and changed in response to needs and considerations external to any deliberate concerns for natural resource problems[8/] (as we might think of them today in terms of water supply, land use management, flood control, soil conservation, water pollution, etc.). In addition to this factor, early resource problems and policies were a matter usually dealt with on an individual or private basis, rather than being a public or governmental issue.[9/] The perceived needs of a growing nation through to about the beginning of the twentieth century determined major policies which affected natural resource use. The principal emphasis was typically upon other values (besides resources per se) and the impact upon resources was either ignored or of secondary concern.[10/] These needs revolved around such issues as national defense, interior communications, and physical and scientific knowledge about its possessions (including vast new territories in the West).

The first of these, national defense, provides some examples worth noting. John Quincy Adams' administration went to such lengths in 1827 as to actually undertake forest preservation programs, in the interest of insuring sufficient mast timber for ships. This issue faded as a major public concern, of course, with the advent of steamships and iron construction.[12/] War and preparation for it prior to World War I, and for all military struggles since, have increasingly brought resource use

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7/ National Water Commission, op. cit., p. 485.

8/ Ernest A. Engelbert. "Political Parties and Natural Resource Policies: An Historical Evaluation, 1790-1950," Natural Resources Journal, Vol. 1, No. 2 (November 1961), p. 225.

9/ Norman Wengert. Natural Resources and the Political Struggle (Garden City, New York: Doubleday and Company, Inc., 1955), p. 15.

10/ _____. The Administration of Natural Resources (London: Asia Publishing House, 1961), p. 7.

11/ John Furman Wall. The Civil Works of the United States Army Corps of Engineers: Program Modernization (Ph.D. Dissertation, Cornell University, 1973), pp. 136, 140.

12/ Engelbert, op. cit., p. 226.

issues to the fore.[13/] In fact, the major federal activity in the water resources development area today has its beginnings rooted in a military circumstance. The Army Corps of Engineers engages in planning and developmental activity regarding water resources in the fields of navigation, flood control, water pollution, and recreation, to name only a few of its responsibilities. But the original concern was in the need for military engineering. It was at the beginning of the American Revolution, in 1775, that the Continental Congress made provisions for an engineering organization, whose first major effort was to fortify Breed's Hill in preparation for what has become known as the Battle of Bunker Hill.[14/] From these early seeds developed today's Army Corps of Engineers whose civil works functions touch many aspects of natural resource use in the United States.

The problem of interior communications in the early development of the nation again provides examples of policies whose consequences for resources were of secondary concern. Late in the eighteenth century, the need for a reasonably reliable system of communication was beginning to assert itself. At the same time, the means of communication available were usually primitive and uncertain, at least relative to the territorial expanse of the country. The conduct of official and private business, postal time schedules, the distribution of laws and public papers, and the carrying out of judicial business and foreign communications all relied in varying degree on the condition of public roads. By most standards, these conditions were very poor.[15/] Early efforts to undertake a comprehensive plan for construction and improvement of roads and waterways at federal expense stumbled over what became a constitutional dispute. The debate (about which more will be covered later) concerned the implied powers of the general government on the one hand, and the strict-constructionist views on the other. In the end the strict constructionist view prevailed, and with the invention of the railroad, the steam locomotive, and the use of private capital, in an atmosphere which was to become dominated by a laissez-faire attitude, private and state initiative held sway in the development of roads and canals. Any developmental scheme so large obviously has extensive implications affecting the nation's resources, but specific concerns regarding this matter were not addressed.[16/]

Probably the most important issue dealing with the nation's natural resources in the era preceding the Civil War was the disposition of the so-called public domain. In the policies that became established in this

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13/ Wengert, The Administration of Natural Resources, p. 7.

14/ Wall, op. cit., p. A-1.

15/ Leonard D. White. The Federalists -- A Study in Administrative History, 1789-1801 (New York: The Free Press, 1948), pp. 479-488.

16/ _____. The Jeffersonians -- A Study in Administrative History, 1801-1829 (New York: The Free Press, 1951), pp. 474-495.

area, "...land was disposed of to take care of the veterans, to fulfill the nation's Manifest Destiny, to provide land-hungry immigrants with family-farm units, to span the continent with railroads, to encourage education."[17] While the concern in establishing these policies was focused on other objectives, they had important effects on the use and allocation of land resources. As in the other examples that have been cited, these effects were in most cases either ignored or of relatively minor concern.

Other examples exist in this vein, and some are outlined here to further illustrate the significant influence of the historical context. The salience of a resource use issue seems to rise in proportion to its perceived relative scarcity and rate of consumption. "Salt, for example, was a crucial commodity in the eighteenth and early nineteenth centuries, so much so that the new Federal government took early steps to see that salt deposits on public lands were placed under Federal management to protect the public from monopoly and speculation, a practice which continued in declining fashion to 1877."[18] The issue has faded from prominence in the twentieth century, however, owing to changes in the commodity's production and distribution.

Tariff policies can have important implications for resource use, exemplified by Hamilton's tariff legislation, aimed at stimulating early American manufacturing.

Other examples of areas of policy development affecting the resource base as a sort of by-product or side effect are government fiscal policy, money and credit policies, and developments in corporation law.[19]

A number of factors contributed finally to a focus of public attention on resource issues, raising them for explicit consideration. The embryonic stages of a trend toward a more uniform, conscious approach to policy development for natural resources can be traced to the time of the Civil War. In the era from 1865 to the turn of the century, dominated by the prominent issues of industrial development and homestead settlement, there occurred also the creation of private and government organizations concerned with developing scientific and technical knowledge. There was also a growing interest in this period in economics, political science, and sociology. Perhaps the most significant effect set in motion by these trends was that with numerous scientific and technical knowledge. There was also a growing interest in this period in economics, political science, and sociology. Perhaps the most significant effect set in motion by these trends was that with numerous scientific organizations in existence, policy makers began to look more

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17/ Wengert, Natural Resources and the Political Struggle, p. 15.

18/ Engelbert, loc. cit.

19/ Wengert, Ibid., p. 16.

frequently to them for advice.[20/] An era of development of consciously employed resource policies was ushered in with the beginning of the "conservation" movement, marked by "...the General Revision Act of 1891, which greatly modified entry onto the public domain and provided the basis for the establishment of the first forest reservations." 21/

Other factors deserve brief mention. The rampant industrialization of the latter nineteenth century increasingly required the consumption of growing and varied quantities of natural resources, whose supply, allocation, and use were to become important considerations. The resurgence of the Malthusian problem has emerged in the twentieth century. This concerns both the classical notion of insufficient food resources concurrent with a growing population, and the more general concept of the depletion of non-renewable resources, specifically petroleum reserves. The growing interest in science and technology has already been mentioned, but its effect on popular attitudes is an additional factor that has concentrated attention on resource programs and policies. To many, "...against the pessimism and gloom of the neo-Malthusians one can place the cornucopian enthusiasm of the scientists and technologists. But whichever viewpoint one chooses to adopt the importance of natural resources and what man does about them is inescapably a primary issue." 22/

Accompanying, and in effect part of, this growing emphasis on consciously employed resource policies has been a growth in the emphasis on methodologies for evaluation of water resource projects, centered around the concept of benefit-cost analysis. Its use in this area grew out of the standard set forth in the Flood Control Act of 1936 requiring that "...the benefits to whomsoever they accrue be in excess of the estimated costs..." The 1936 act did not spell out any actual criteria, however, and efforts in 1950 (the Green Book), 1962 (Senate Document No. 97), and 1973 (Water Resources Council -- Principles and Standards for Planning Water and Related Land Resources) have addressed this issue with increasing sophistication and mounting emphasis on the environmental impact account (particularly non-monetary values).23/

Administrative and Political Environment

Having depicted the larger historical framework within which cost sharing policies were conceived and developed to their present state, another topic of significance deserves mention in the historical context, although it will be discussed further and in more conceptual terms in

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20/ Wengert, Ibid.

21/ Engelbert, op. cit., p. 227.

22/ Wengert, The Administration of Natural Resources, pp. 9-12.

23/ Stephen A. Marglin. Public Investment Criteria (Cambridge, Mass.: The M.I.T. Press, 1967), pp. 16-17.

the next chapter. Some peculiar characteristics of the American experience in the political and administrative arenas is illuminated by looking at the U. S. approach that has been taken in dealing with the various resource issues that have surfaced. This approach has been aimed at specific, narrowly perceived problems, in a somewhat piecemeal fashion. Deliberative natural resource policies that have developed, then, have been in response to problems which grew to such magnitude or significance as to demand attention (land disposal, water supply, water pollution, energy). Norman Wengert, writing about the American experience in public administration in natural resources, cites as a partial cause the general American espousal of a "...philosophical or ideological hostility to national planning."24/ He goes on to further stress four points which the historical experience has illuminated as typical of American resources administration. These points are:

1. The growth and development of American resources programs has been pragmatic and pluralistic, directed to solving particular problems identified at the time a program was instituted.

2. The growth and development of American resources programs had been dependent upon the leadership and zeal of individuals, usually specialists or technicians, and the support of articulate groups.

3. The growth and development of American resources programs has been deeply involved in politics, political struggle, and conflict.

4. American resources programs have been administered by specialists and technicians, rather than by administrative generalists, and their dominant objective has been program accomplishment. 25/

Aside from these general administrative and political characteristics, the evolution of resources policies has evolved within the context of party politics. In this light, it is worth noting the major findings of Ernest Engelbert, who writes about this subject for the period 1790-1950.26/ The brief account which follows draws primarily from this analysis.

Engelbert's study casts the subject of the evolution of U. S. policy for natural resources in the light of political party platforms and campaigns, voting and debate in the Congress, and presidential action and administration, to the extent reflective of the philosophy of the party in power.

24/ Wengert, Ibid., p. 27.

25/ Ibid., pp. 27-28.

26/ Engelbert, op. cit., pp. 227-256.

In the years prior to 1860, the key resource issue was land.

> ...the Whigs...might be titled as the party of conservation since they were interested in a partially controlled development of America's economy which in turn was reflected in a more conservative attitude toward the development of the public domain. One might conclude that had this attitude prevailed, there would have been far less exploitation of the country's natural resources. 27/

The thrust of the Democratic Party position, on the other hand, was for rapid settlement and development. The Democrats' proposals

> ...were also designed to offset the opportunities for large scale speculation which land grants and internal improvement ventures afforded. Cheap and available land laid the basis for a democratic society and a system of free enterprise. The gross exploitation of natural resources by large industry that marked the close of the nineteenth century had not really begun in the pre-Civil War agrarian economy. 28/

The Republican Party's program in the late 1850's

> ...threw overboard the conservative manifestations of both the Whig and Democratic parties and proceeded to embrace a philosophy of unrestricted development. And this was at a time when it was becoming increasingly evident that the opposite course should be followed and programs of prudent resources management instituted. 29/

In this pre-1860 era, both political resource issues and political parties were closely aligned with sectional interests. With regard to the Republicans, Engelbert goes on to say that it is to their credit

> ...that they began to veer away from a sectional approach and to weigh questions on a more pronounced national basis. Under their leadership the Department of Agriculture and the land grant colleges were established. From these institutions were to flow many of the blessings that contributed to a wiser resources policy. 30/

As the author points out, a simplistic approach in which a review of the history of natural resources policies is interpreted only in terms of the central philosophies of political parties, would overlook other

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27/ Ibid., p. 235.

28/ Ibid.

29/ Ibid., p. 236.

30/ Ibid.

important factors. For instance, conflicts of interest between various groups, the role of crises, and other important influences play major roles. To some extent of course, political party philosophies articulate and reflect these other motivating factors, but they certainly aren't the only important explanatory variables. Nonetheless, it is a helpful indicator, and for the post-1860 period, a capsulized version of such an interpretation is quoted below:

> For the period 1861-1890 Republican Party positions on natural resources could be viewed within the framework of a rising capitalism, the period 1891-1920 could be seen as a reaction against wanton exploitation by private interest to which both the Democratic and Republican Parties were trying to adjust, and the period of 1921-1950 could be described as an era of governmental intervention represented by the prevailing economic philosophy of the Democratic Party. 31/

Cost Sharing-Policy Origins

Federal policies for sharing in the expense of water resource planning and development of projects and programs have their beginnings in the earliest days of the national experience. Although the essential authority for federal involvement in this area is based in pertinent clauses of the U. S. Constitution,32/ the origins of federal involvement really pre-date the Constitution. These origins were based in a concern for transportation and communication.

> There was abroad in the Nation well before the adoption of the Constitution a spirit of public involvement which carried with it, in the eyes of Washington and many others, a duty incumbent both upon governments and individual citizens to develop the Country's natural advantages by improvements in transportation. 33/

The problem of communications has been mentioned earlier. Although debate over whether the "General Government" should properly engage in improvement of post roads came to nothing in the late 1700's, this setting is illustrative of the atmosphere at the time. And while the means of communication were generally poor, as Leonard White has noted,

> ...they had to suffice to maintain as effective connection as was then technically feasible between the center and its outlying agents, including foreign representatives. The slowness

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31/ Ibid., p. 254.

32/ L. Douglas James and Robert R. Lee. Economics of Water Resources Planning (New York: McGraw-Hill Book Company, 1971), p. 153.

33/ William J. Hill and Robert W. Hull, op. cit., p. 9.

and unreliability of the means of communication were however, serious handicaps to the conduct of administration in these early years. 34/

The companion concern, transportation, was the key consideration. In the post-revolutionary 18th century, trade occupied an urgent place among the affairs of the nation, which fueled the ship building industry and laid emphasis on water transportation in general. The inland water transportation issue was even more closely tied to the communications problems. Settlement and development in the West were hampered by poor communications and expensive transportation and travel over land. Coastal, lake, and riverine waterway systems eventually became the source of an inland waterway system providing a link to the western states.35/

The beginning policy of internal improvements can be seen "...in action taken by the First Congress in 1789 authorizing the Federal Treasury to assume the costs of lighthouses, beacons, buoys and public piers which had been erected by the Colonial governments."36/

It was an atmosphere of sectionalism in which President Jefferson's 1806 Annual Message proposed that a comprehensive development of roads and waterways would help to bring economic harmony to the country. Secretary of the Treasury Albert Gallatin's 1808 Report on Roads and Canals firmly espoused this sentiment, formally recommending federal assumption of costs of a broad internal improvements plan.37/ Serious action in this matter was interrupted by the War of 1812, and interest resumed in 1815 with President Madison's Seventh Annual Message in which he recalled

> ...the attention of Congress to the great importance of establishing throughout our Country the roads and canals which can best be executed under national authority... 38/

Congress passed the first river and harbor bill in 1824, authorizing federal public works for the improvement of rivers and harbors. This was the first of many similar Acts, and tended to encourage state involvement in local internal improvement plans. The state canal building programs progressed at a feverish pace through the 1820's, and eventually the states overextended themselves to support these plans, which became

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34/ Leonard D. White, The Federalists, p. 479.

35/ Leonard B. Dworsky. The Nation and Its Water Resources (Cornell University Water Resources and Marine Sciences Center, Ithaca, N. Y., 1973), p. 19.

36/ Hull, op. cit., p. 10.

37/ Ibid.

38/ Ibid., p. 11.

increasingly uncoordinated in terms of a national pattern. The idea of a national plan fell apart in the late 1830's due to this state initiative and to the severe 1837 recession.[39] In the aftermath of this failure on the part of locally supported improvements, the question of federal responsibility for internal improvements revolved essentially around a constitutionally-based dispute. Earlier, in 1817, only two years after he had favorably brought the issue to the attention of Congress, President Madison vetoed a bill aimed at internal improvements at national expense.[40] Despite his apparently favorable sentiments, it was the constitutionality question which encouraged this action. As he wrote in his veto message:

> I am not unaware of the great importance of roads and canals and the improved navigation of water courses, and that a power in the National Legislature to provide for them might be exercised with signal advantage to the general prosperity. But seeing that such a power is not expressly given by the Constitution, and believing that it cannot be deduced from any part of it without an inadmissable latitude of construction... [41]

The dispute continued to turn on the issue of constitutionality, with vetoes of internal improvements legislation exercised by Presidents James Monroe, Andrew Jackson and James K. Polk. Polk's veto messages in 1846 and 1847 included explanations of his constitutional arguments against the bill. His analysis essentially embraced the strict constructionist view of the Constitution.[42] The tide turned following the eloquent address to the Congress, by Representative Abraham Lincoln in 1848, a portion of which is quoted at the beginning of this chapter. Mr. Lincoln expressed a looser vision of the Constitution, whose implied powers laid the basis for federally funded internal improvements. President Millard Fillmore, in 1850, further asserted an espousal of this view and by this time, the basis essentially was established for federal internal improvement programs.[43]

As mentioned earlier, the Constitution is still the basic authority for federal responsibilities, and hence the source of cost sharing precedence, in water resources development. More specifically, the source is implied in essentially five clauses:[44]

39/ Ibid., pp. 16-17.

40/ Frank E. Smith. Land and Water, 1492-1900 (New York: Chelsea House Publishers, 1971), p. 178.

41/ Ibid., p. 179.

42/ Ibid., pp. 180-197.

43/ Ibid., pp. 198-208.

44/ James and Lee, op. cit., pp. 153-156.

1. The commerce clause (Article I, Section 8) giving the Federal Government the power to regulate commerce, with implications for control of navigation, and interstate sale of hydroelectric power.

2. Treaty-making power (Article II, Section 2) -- Although there are not an abundance of major rivers crossing international boundaries, gives jurisdiction to the President (with 2/3 vote of the Senate) over water resources development on such water bodies, given that an appropriate treaty has been made.

3. Proprietory power (Article IV, Section 3), -- giving the United States jurisdiction over water resources development on publicly owned land.

4. The War power (Article I, Section 8), giving the power to "provide for the common defense," has been used as authority in Tennessee Valley hydroelectric power development in connection with the World War I effort (nitrates production).

5. The general welfare clause (Article I, Section 8), which in recent decades has really been at the basis of constitutional authority for water project development at national expense.

It has been in this atmosphere, then, that federal assumption of responsibilities and cost sharing policy have evolved. Other major areas of activity such as flood control, drainage, water supply, hydroelectric power, water quality control, and recreation, weren't so intimately bound up in constitutionality questions as was the navigation-internal improvements issue, originally.

Initial flood control efforts date to 1717 in the U. S., when plantation owners near New Orleans built a flood protection project on the Mississippi. Federal involvement essentially started with the creation of the Mississippi River Commission in 1879, which assumed responsibility for flood control. It was in the wake of severe flooding that in 1936 the government initiated, with the Flood Control Act of 1936, a major program of flood control for the country.[45/]

Water supply was originally not a matter of federal concern at all. The traditional situation was one in which a relatively small demand was satisfied by a relatively abundant source of supply located conveniently nearby. As accelerating growth in demand has continued, supply remains ultimately a constant. Urbanization, concentrating large numbers of people in small areas, has naturally tended to lead toward depletion of nearby sources, and to a need for larger scale plans for water supply

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45/ Ibid., p. 230.

for domestic and industrial use. The emergence of the water supply issue as a large scale and complex matter has led to increased financial involvement for the federal government. 46/

Although there is no federal cost sharing per se on hydroelectric power development, there may be federal cost sharing when viewed on a de facto basis. Hydro power is often one of a number of features on Corps of Engineers and Bureau of Reclamation Projects, and the methods of cost allocation and repayment have been criticized as not fully covering the hydro power investment.47/ The passage in 1920 of the Water Power Act, creating the Federal Power Commission to oversee these matters, may be viewed as a key event in the federal role in this area.48/ Prior to this time, thermal power generation had predominated as the source of electricity, due primarily to inefficient transmission technology, so that generation at distant hydro-sites was unfeasible. Beginning around 1910, fuel shortages and transmission technology advances combined to bring hydroelectric power into more widespread use.49/ The stage for federal jurisdiction had essentially already been set, in established precedent for control of navigable waterways, by a series of Court interpretations involving the commerce clause, and dating to Gibbons v. Ogden, 22 U. S. 1 (1824). 50/

As in other areas, federal jurisdiction in connection with the navigation issue set the stage for assumption of financial responsibilities in water quality control. Section 13 of the River and Harbor Act of 1899 established authority for the Army Corps of Engineers to regulate the discharge of materials into navigable waters which impose potential hazards to navigation. Although strict interpretation confined the applicability of this statute to navigation until 1971, it has established authority to some extent for federal intervention in water quality control.51/ As with the water quantity issue, the view, long held, that the nation's rivers and streams seemed to have a limitless source and capacity to assimilate waste, gradually eroded as urbanization and industrial growth have expanded. Positive major action by the federal government in this area began with the Water Pollution Control Act of 1948. Enactment of this law, the culmination of legislative efforts from the late 1930's, firmly established an authoritative stance for the federal jurisdiction over water pollution. The policy has evolved to the present, with amendments in the intervening years modifying and

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46/ Ibid., pp. 285-286.

47/ National Water Commission, op. cit., p. 491.

48/ Charles F. Phillips, Jr. The Economics of Regulation (Homewood, Illinois: Richard D. Irwin, Inc., 1965), pp. 592-595.

49/ James and Lee, op. cit., p. 326.

50/ Phillips, op. cit., p. 593.

51/ Wall, op. cit., pp. 402-405.

adding to the authority established in the 1948 Act.[52/] The most recent addition to this body of laws dealing with water pollution has been the Federal Water Pollution Control Act Amendments of 1972. The major provisions of this bill call for: the control, through certain standards and guidelines, of municipal and industrial pollution, accompanied by enforcement mechanisms not included in prior laws; and for federal construction grants for sewage treatment facilities. 53/

While water-based recreation has always been an important source of leisure-time activity, it has received increased attention as a national policy concern in recent years with concomitant urbanization, more leisure time, and access to distant sites provided by today's transportation network. The Federal Water Project Recreation Act of 1965 explicitly embraced recreation as an express project purpose, and provides the basis for present recreation planning and development in connection with water resource projects. 54/

The origins of present day federal responsibilities in the enhancement of fish and wildlife has a familiar pattern. The preservationist tone at the basis of these policies wasn't always viewed as important. But with the advent of increasingly intensive agricultural activity coupled with extensive urbanization, the accompanying water resource development for other purposes precipitated threatening effects on fish and wildlife resources. The key legislative milestone in this area is the Fish and Wildlife Coordination Act of 1959. Earlier policy had been aimed at the amelioration of damaging effects of water projects. The 1959 Act marks a turning point, requiring a more active assessment of fish and wildlife considerations in conjunction with other project objectives. 55/

The foregoing discussion of policy origins of today's cost sharing responsibilities incumbent upon governments and beneficiaries of water programs and projects reveals a general pattern. The earliest milestones, involving decisions concerning navigation and internal improvements, were slowly arrived at and involved major constitutional issues. Owing to the complex and systemic nature of both the natural and social systems, and their mutual interrelatedness, federal jurisdiction crept into other considerations over time. The need for a broad federally sponsored overview is perhaps based ultimately in such notions as Garret Hardin's "Tragedy of the Commons,"[56/] and Alfred E. Hahn's "The Tyranny of Small

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52/ Leonard B. Dworsky. Analysis of Federal Water Pollution Control Legislation, 1940-1966, Cornell University Water Resources and Marine Sciences Center, Ithaca, N. Y., pp. 1-34.

53/ U. S. Environmental Protection Agency. "The Federal Water Pollution Control Act Amendments of 1972," Environmental Facts (Washington, D. C.), July 1973.

54/ James and Lee, op. cit., pp. 395-396.

55/ Ibid., pp. 422-423.

56/ Garrett Hardin. "Tragedy of the Commons," Science, Vol. 162 (December 13, 1968), pp. 1243-1248.

Decisions."[57] On the other hand, there continues to be the counterbalancing effect of what has been so aptly labelled "muddling through" in the formulation, establishment, and administration of policies.[58] At any rate, the adoption of policies for federal assumption of responsibilities has responded in one way or another to compelling needs, for which private and local piecemeal response was either inadequate or altogether lacking. The mechanics of the policy development in this area has been a matter of seemingly uncoordinated and unrelated actions over time, as the National Water Commission has pointed out. The prime concern in each case seems to have been an overriding national need to act, so that specific cost sharing matters themselves have been not only uncoordinated in many instances to begin with, but in addition, issues of secondary concern. Cost sharing seems to have been more a matter of balancing this overriding need to act, with a desire to avoid an overly centralist federal government posture. Recognition of such cost sharing objectives and considerations, in addition to formal economically-oriented welfare optimization schemes, is a matter addressed further in Chapters III and IV. This vision of the historical overview has hopefully illuminated to some extent the climate in which the specifics of cost sharing policy have been and are decided.

Chapter III -- Economic, Political, Institutional Considerations

Introduction

The 1973 final report of the National Water Commission belongs to a history of similar studies on water programs and policies in the United States. In fact, "... at least 20 investigative bodies have been appointed to look into what should be done about the nation's water resources..." since about the beginning of the 20th century.[59] A number of these have touched upon the subject of cost sharing in one way or another, but this most recent effort has dealt with the topic at least as deeply and far-reaching as any. Particularly owing to the general posture taken with regard to cost sharing, the Water Commission's document has apparently even been referred to by some as 'the last water report.'[60] As pointed out earlier, recommendations call for a shift in the burden of developing water resources to local beneficiaries, and generally a reduction of the federal role. The essence of the philosophy inherent in the report is perhaps most succinctly captured in the following statement:

57/ Alfred E. Hahn. "The Tyranny of Small Decisions: Market Failures, Imperfections and the Limits of Economics," Kyklos, 1966, pp. 23-47.

58/ Charles E. Lindblom. "The Science of Muddling Through," Public Administration Review (Spring 1959), pp. 79-88.

59/ Constance Holden. "Water Commission: No More Free Rides for Water Users," Science (13 April, 1973), p. 165.

60/ Ibid.

> Its basic message is that the policy of using general tax revenue to pay for water resource development has served its purpose. '...the West for which this policy was designed,' says Commission chairman Charles F. Luce, 'has been won.' 61/

The following discussion will cover pertinent aspects of some of the prior water policy studies referred to above, as well as those recommendations of the most recent effort which deal with cost sharing. Following this introductory background material, discussion turns to economic, and political-institutional considerations which seem to follow from a reading of the 1973 Water Commission's cost sharing recommendations.

Prior Studies

1. The First Hoover Commission -- It was a climate of concern for efficiency in the government's administrative functions in which Congress in 1947 authorized the Commission on Reorganization of the Executive Branch of the Government.62/ The efforts of the First Hoover Commission did not explicitly address the matter of cost sharing in water resources development, although its general treatment of water resources has implications for cost sharing. Briefly, this commission directed its efforts toward reforms which hopefully would lead to "...a more responsible and a more responsive government, a government which will act with dispatch, with greater internal coordination and harmony, with consistency of administrative policy, and economy of operation."63/ In addressing this topic, the Commission focused on what it perceived as defects in the organization of water development and use, citing the lack of formal review of projects, the contradictory overlaps of jurisdiction between agencies, and the internal inconsistency of policies within agencies themselves. Cost sharing received attention as a sub-issue. As the Natural Resources task force pointed out:

> Varying administrative standards of feasibility, benefit-cost evaluation and cost allocation have added to the confusion in these areas. Inter-agency rivalry has fostered a sort of Gresham's law with respect to Federal financial policies, the tendency being far higher standards of repayment by State, local, and private beneficiaries to be replaced by lower ... 64/

61/ Ibid.

62/ Wall, op. cit., p. B-76.

63/ The Commission on Organization of the Executive Branch of the Government, Concluding Report -- A Report to the Congress, May 1949.

64/ _____. The Hoover Commission Report (New York: McGraw-Hill Book Company, 1949), p. 283.

Besides these references to "...inequities among beneficiaries and a drain on the Federal treasury ..." and resultant interagency conflict, the task force referred to problems arising out of the "...inherent conflict in use of reservoirs for flood control and their use for power or irrigation...", because of the tension between the need for even flow for power development and the need for empty reservoirs prior to flood season, for flood control.[65] The overall thrust of the First Hoover Commission's recommendations for the amelioration of this inefficiency and wastefulness was to consolidate, bringing the conflicting agencies into one agency. At the same time, the Commission realized the existence of limits to centralization economies and recognized a need for a certain amount of decentralization "... under proper central controls...", to account for such factors as varying local conditions.[66]

2. The President's Water Resources Policy Commission -- In response primarily to Executive Order No. 10095, this study commission, chaired by Morris L. Cooke, completed its work in December 1950, submitting its report, A Water Policy for the American People.[67] The Cooke Commission was directly concerned with water policies and programs, whereas in the First Hoover Commission report, the water area was one of many topics. Cost sharing was a more substantial subject in the 1950 study, and was dealt with at some length in Chapter 5, "Reimbursement."[68] The Commission noted first the extreme positions in the cost sharing policy controversy -- at one end of the spectrum, advocates of rapid development favor complete assumption of financial responsibilities by the Federal Government; at the other end, those who would restrict water resources development support complete reimbursement by beneficiaries, limiting development to self-supporting, self-liquidating investments. The report goes on to recognize the rather complex nature of this matter, noting the intermingling and interrelatedness of private and social (or widespread) benefits, the issues attendant to state and local participation, the national interest, and the problem of excess gain for a few individuals arising out of some water resource investments. In addition to a discussion of these issues affecting cost sharing, the Commission identified what it perceived as basic objectives of reimbursement policy. Citing the fact that existing policies had been "... oriented toward isolated, single purpose functions designed to serve local needs and private interests...", the Commission urged that policies reflect the multi-purpose nature of water development, and the "side by side" existence of both private and public activity involved. Briefly the objectives outlined were that:

65/ Ibid., p. 284.

66/ _____. Concluding Report -- A Report to the Congress, May 1949, pp. 32, 37, 39.

67/ The President's Water Resources Policy Commission. A Water Policy for the American People (Washington, D. C.: U. S. Government Printing Office, December 1950), 3v.

68/ Ibid., pp. 67-86.

a. Reimbursement policy should reflect comprehensive multi-purpose planning and development;

b. reimbursement policy should distinguish public from private benefits, and that public benefits should be non-reimbursable;

c. reimbursement policy's prime objective should be to recover costs associated with purely private gain;

d. reimbursement should be a key, though not the only, criterion for deciding whether or not to implement programs; and

e. reimbursement can be used to induce local financial participation. 69/

The general recommendations which concluded the Commission's treatment of cost sharing emphasized a need for uniformity and consistency in a national policy. The major theme present in the recommendations is that collectable repayment for benefits received should be pursued as far as possible, whether through direct assessment or through agreements with local institutions such as state and local governments or special districts. Congress was to make a clear distinction, in the making of appropriations, between the following portions of the total investment in a project or program:

a. that considered reimbursable by direct beneficiaries;

b. that considered secondary in nature, for which reimbursement should be the responsibility of the applicable state and local governmental institutions;

c. that to be covered by general revenue, and considered as contributory to national benefits. 70/

3. The Subcommittee to Study Civil Works, Committee on Public Works (House of Representatives, 82nd Congress, 2nd Session) -- In response to a House resolution adopted August 20, 1951, this Subcommittee submitted in December 1952 its report, "The Civil Functions Program of the Corps of Engineers, United States Army." 71/ The central concern was with the large backlog of authorizations which seem to build up over time, so that the list tends to not be current. The Subcommittee's

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69/ Ibid., pp. 68-69.

70/ Ibid., pp. 82-84.

71/ Committee on Public Works, House of Representatives, Subcommittee to Study Civil Works, 82nd Congress, 2nd Session. The Civil Functions Program of the Corps of Engineers, U. S. Army. House Committee Print No. 21 (Washington, D. C.: U. S. Government Printing Office, December 5, 1952).

report and recommendations cover a variety of topics pertinent to this concern, and touches briefly on cost sharing in its discussion of economic justifications.72/ Summing up its thoughts on this topic, the Subcommittee stated:

> The subcommittee believes that a skeptical approach should be taken in the acceptance of favorable economic analysis based entirely on theoretical and mathematical computations. A more practical measure of the worthiness of an undertaking is the willingness of the immediate beneficiaries to participate in the work by the contribution of funds proportionate to the local benefits. 73/

4. The Second Hoover Commission -- Created by the passage in 1953 of the Brown-Ferguson Act, this commission was assigned to look again at the organization of the executive branch of the government with an eye to efficiency, as the First Hoover Commission did. The Second Hoover Commission was given the additional task, however, of addressing the issue of whether the Federal Government should be performing some activities at all.74/ In its report on Water Resources and Power (v. 1), the Commission's Task Force on Water Resources and Power addressed issues essentially by function, dealing in turn with irrigation, navigation, flood control, and power.75/ Although the first order emphasis seems to have been on organization, the task force dealt with cost sharing by extension, as a sort of second order consideration. As cited in the report, this task force stated that:

> The most difficult problem of water resources development is the balancing of the interests, demands, and responsibilities of individuals, local groups, States, and the Federal government. 76/

Cost sharing necessarily falls within this area, for which the task force saw a need for coordinated national policies in water development. The obstacles noted were overlapping and conflicting interagency jurisdictions, as well as conflicting interests between states and the federal government.

72/ Ibid., pp. 34-35.

73/ Ibid., p. 35.

74/ Citizens Committee for the Hoover Report. Status of the Hoover Report -- 1949-1953, v. 1, p. 11.

75/ U. S. Commission on Organization of the Executive Branch of the Government. Water Resources and Power, Vol. 1, June 1955.

76/ Ibid., p. 11.

The Task Force touched on cost sharing, or 'reimbursement,' policies in its treatment of cost allocation for multi-purpose dams. It cited a tendency for controversy to arise between the Corps of Engineers, the Department of Interior, and the Federal Power Commission, which all have an interest in cost allocation.77/ It recognized as the major reason for federal responsibility in paying for water development projects the general basis of furthering

> ...the national interest or to accomplish broad national objectives, where projects, because of size or complexity or potential multiple purposes or benefits, are beyond the means or the needs of local or private enterprise. Under other circumstances the responsibility for development should be discharged by State or local governments, or by local organizations, or by private enterprise. 78/

This theme is found again in the discussion of flood control, in which the Task Force stated that while largely federally funded, "Many flood-control projects now in use and many more that are being considered for authorization or appropriation are largely, if not altogether, local in their utility." 79/

In its discussion of the navigation issue, the Task Force recommended

> That Congress authorize a user charge on inland waterways except for smaller pleasure craft, sufficient to cover maintenance and operation, and authorize the Interstate Commerce Commission to fix such charges. 80/

The position taken in the report concerning federal marketing of power was that rates charged should cover actual costs, at a minimum, thus reducing inequitable competition with private individuals engaged in the same activity.

In sum, the overall tenor of the recommendations of the Task Force on Water Resources and Power was that the federal government should avoid, or be properly regulated in, those activities which tend to compete with private enterprise, and/or are nonessential and unnecessary in terms of efficiency. 81/

77/ Ibid., p. 28.

78/ Ibid., p. 36.

79/ Ibid., p. 74.

80/ Ibid., p. 85.

81/ Ibid., p. 115.

5. The Commission on Intergovernmental Relations -- This commission, established by the Taft-Halleck Act, P.L. 109, July 10, 1953, submitted its final report in June of 1955. The Commission was directed "...to examine the role of the National Government in relation to the States and their political subdivisions."82/ Cost sharing is necessarily a major consideration in the area of intergovernmental relations, and vice versa, and the Commission's report touches on this important topic a number of times. The theme advanced throughout the document is that national action should be reserved "...for residual participation where State and local governments are not fully adequate, and for continuing responsibilities that only the National Government can undertake."83/ While seeing a need for decentralization and for the strengthening of local government, the Commission saw that adequate state and local financial resources have necessarily to accompany a readjustment of national-state relations.84/ In the functional area of natural resources and conservation, the Commission took the general position that

> ...the capital costs of multi-purpose, basinwide water resource developments be equitably divided between the National Government and the States concerned, in the light of benefits received, ability to pay, and other attendant circumstances. 85/

The basis for equitable division of financial responsibilities was perceived as a correspondence between the right of sub-national governments to share in planning and development, and a concomitant "...responsibility of the inhabitants to pay a reasonable portion of the project costs." The feeling was that such a guideline for division of responsibilities would tend to resist domination of activities in this area by the Federal Government. 86/

6. The Senate Select Committee on National Water Resources -- This committee, created by the Senate in 1959, was directed to review water resources activities in the U. S. in the context of the national interest, and to focus on the quantity and quality of water which would be required up to the year 1980. In passing Senate Resolution 48, establishing the committee, the Senate was expressing concern in the face of seemingly unceasing growth in the demands being placed on the nation's water resources, and in view of the fact that little had been done "...on

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82/ The Commission on Intergovernmental Relations. A Report to the President for Transmittal to the Congress, June 1955, p. v.

83/ Ibid., p. 6.

84/ Ibid., p. 47.

85/ Ibid., p. 243.

86/ Ibid.

the many series of recommendations in the water resources field."[87] Areas seen by the Committee as most important included the need for continued basic research, long term comprehensive planning, and a need to bolster state participation in planning and development.[88] Cost sharing itself was given brief mention, but was not viewed as a crucial issue. It was the opinion of the Committee that the majority of federal water resources activities had been in areas in which local interests either could not or would not have acted. It noted that the ideal cost sharing arrangement would be one in which federal/non-federal division of cost burdens reflected the proportion of national to local benefits. Noting, however, that identifying such a division is not an easy task, the Committee summed up its position, stating that it was

> ...not overly concerned with the cost sharing aspect of our water resources problems, because ... present policies tend to even out the sharing of costs over the long run, among all the people. 89/

7. The Task Force on Federal Flood Control Policy -- On August 10, 1966, President Lyndon B. Johnson transmitted to the Congress this Task Force's report, "A Unified National Program for Managing Flood Losses."[90] This effort was directed at the goal of arriving at a broader and more unified national flood control policy, in the face of continued rising flood losses and continued uneconomic uses of the nation's flood plains, which tend to be encouraged by existing policy.

One of the basic areas covered by the Task Force was that of cost sharing, which it perceived as being a key feature in managing efforts to stem flood damages, for essentially two reasons --

a. Cost sharing can be utilized to stimulate efforts in investments and land use by subnational entities.

b. Furthering requirements by states and local groups to share in the costs of flood damage reduction is likely to lead to stronger, more informed and intelligent actions by these groups.

In proposing that cost-sharing arrangements be modified to achieve a more equitable system, the Task Force set forth five points it considered essential to such modifications. These points are stated below:

87/ Theodore M. Schad. "Perspective on National Water Resources Planning," Journal of the Hudraulics Division -- Proceedings of the American Society of Civil Engineers, HY4, July 1962, p. 34.

88/ Senate Select Committee on National Water Resources, Senate Report 29, 87th Congress, 1st Session, pp. 17-19.

89/ Ibid., p. 23.

90/ House Document No. 465, 89th Congress, 2d Session, August 10, 1966.

The more widely the beneficiaries share in costs, regardless of the type of project, the more likely the programs will promote efficient and socially desirable use of flood plains.

The larger the proportion of costs that are repaid the greater the check on uneconomic investments.

There is special advantage to any policy which identifies beneficiaries and charges them some portion of the cost of achieving economic future development in the flood plain.

There is no reasonable basis for differing cost-sharing requirements for salt water protection as contrasted with fresh water protection projects or for varying requirements between regions.

Fifth, and absolutely essential, cost-sharing policy should be consistent for all federal construction agencies. 91/

The report of the Task Force went on to suggest a distinction in cost sharing arrangements for flood control between investments protecting existing property, and those protecting future development. Other areas discussed were the need for uniformity in cost allocation procedures, a policy for public acquisition of flood plain lands, and extension of loan authority to enable local interests to meet financial obligations arising out of cost sharing arrangements. 92/

Chapter IV -- The National Water Commission -- Economic Efficiency

A full analysis and review of present cost sharing arrangements and the specific recommendations seen by the Commission as needed for a more sensible policy can be found in Chapter 15, "Paying the Cost of Water Development Projects," of the National Water Commission's final report, Water Policies for the Future, June 1973. 93/ The following brief summary outlines the major points of the analysis and recommendations. In its appraisal of present cost sharing policies for water resource programs and projects, the Commission focuses on what it views as inconsistent incentives in several respects. Citing inconsistency in present policies among means for the same purpose, among agencies for similar purposes, and among purposes generally, the Commission urges reform "...to provide consistent incentives for bargaining to achieve

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91/ Ibid., p. 42.

92/ Ibid., pp. 42-45.

93/ National Water Commission, op. cit., pp. 485-499.

selection of the most desirable projects from both national and local viewpoints." 94/

The report goes on to show that wide variations exist, particularly in the area of flood control, in the breakdown of cost shares between federal and non-federal interests, for different methods of achieving a given level of flood protection in various Corps of Engineers projects. Furthermore, it points out that different agencies handling the same or similar purpose have different cost sharing policies, so that "unproductive competition" is encouraged, in which local interests "shop around" for the best deal in terms of financial responsibilities. In the case of multi-purpose projects, the Commission argues that the incentive exists for local interests to bargain for project formulation in which costs are allocated to purposes requiring minimal or no cost sharing responsibilities for them.

Lastly, the report contends that present policies providing for repayment arrangements for non-federal cost shares are inconsistent among agencies and among purposes. This is in reference to several areas in which present policies provide that the federal government fund the full cost of project construction initially, permitting local repayment for the non-federal share to be made over a period of time. In the arrangements for this kind of repayment agreement, variations exist concerning length of repayment period and interest rate to be charged. A variation in and of itself, of course, does not necessarily constitute a real inconsistency. The Commission recognizes this, but directs its criticism at variations which are not logically founded on sound economic principles. One of the underlying reasons for the advocation of consistency is the avoidance of unintended subsidy. While not generally disfavoring the idea of subsidy itself, the general rule put forth on this matter in the report is that direct beneficiaries, to the extent identifiable, should ordinarily bear costs associated with benefits they receive. Subsidies should be employed only when this is not possible and/or when some compelling social purpose is served. However, with the exception of water based recreation no compelling social purposes are identified, nor is there any guidance presented for the identification of such purposes.

In conclusion, the Commission spells out specific legislative reforms in cost sharing policy by purpose, following the general criterion that

> Insofar as practicable and administratively feasible, the identifiable beneficiaries of project services should bear appropriate shares of development and operating costs through systems of pricing or user charges (eg., special assessments, taxes, fees, etc.),... 95/

94/ Ibid., p. 490.

95/ Ibid., p. 497.

Adoption of the recommendations, it states, will lead toward achievement of the following general goals: 96/

1. Provision of incentives for the selection of efficient projects, properly integrating water resources policies harmoniously into other national programs.

2. Provision of incentives for proper timing, location, quality and quantity of services.

3. Equitable sharing of project costs by beneficiaries.

An Economic Model of Cost Sharing in a Bargaining Context

The underlying theoretical basis in support of the stance taken by the Water Commission, particularly with regard to the arguments for consistency and for application of the "beneficiary-pays principle," is perhaps most lucidly set forth by Harold E. Marshall in his article, "Economic Efficiency Implications of Federal-Local Cost Sharing in Water Resource Development."97/ The following brief summary highlights the key points of his analysis.

Marshall essentially analyzes two cases in relating the effects of cost sharing arrangements, in terms of local decision making responses, to the attainment of social efficiency in water resources investment decisions, with regard to project design and selection. The two cases examined in the article deal with:

a. division of cost sharing responsibilities for different techniques, or means, of providing a particular project purpose; and

b. the effects of different local cost share requirements on efficiency, in the selection of the scale or size of a project.

Although the hypothetical example will relate to flood control, the principle is said to be applicable generally. Different techniques are theoretically available to provide the same project output. For example, upstream reservoirs, flood plain management/insurance programs, floodproofing of individual structures, and localized structural solutions such as various combinations of walls, levees, and stream channelization all could conceivably contribute to some satisfactory curtailment of the losses imposed by floods. The share of investment costs, and of operation and maintenance costs (O and M), required to be incurred by local interests varies from technique to technique, as formally established legislatively and/or administratively.

96/ Ibid., pp. 495-496.

97/ Harold Emory Marshall. "Economic Efficiency Implications of Federal-Local Cost Sharing in Water Resource Development," Water Resources Research, Vol. 6, No. 3, June 1970, pp. 673-682.

In addition to these variations in formalized requirements, James C. Loughlin has cited a further source of inconsistency. Under provisions of the Flood Control Acts of 1936 and 1941, and the Watershed Protection and Flood Prevention Act of 1954 (P.L. 566), local cooperation requirements for certain types of flood control projects (generally all such projects excepting large Corps of Engineers and Bureau of Reclamation reservoirs) include, among other things, the provision that local interests:

a. supply lands, easements, rights-of-way, and make the necessary relocations for the construction of the project; and

b. be responsible for operation and maintenance after project completion.

Loughlin's observation is that these requirements vary almost at random from project to project, further distorting any sense of equity in the distribution of cost burdens in the flood control program. His analysis includes a sample of 47 Corps of Engineers local protection flood control projects, representing nearly all such projects authorized in the Rivers and Harbors Acts of 1965, 1966, and 1968. The findings briefly were that:

> ...lands, easements, and rights-of-way, as a percentage of project first costs, ranged from 3% to 47%. Including the capitalized value of local operation and maintenance costs, nonfederal economic cost varied from 8% to 54% of total economic cost (first cost plus capitalized operation and maintenance). Furthermore, rank correlation between the nonfederal and cost-shares and benefits received from the projects indicated no close association between these variables. 98/

With regard to this latter observation, Loughlin calculated values for Spearman's coefficient of rank correlation between flood control benefits and lands, easements, and rights-of-way (expressed as a percentage of first cost); and between flood control benefits and nonfederal economic cost (expressed as a percentage of total economic cost). These values are +.16 and +.15, respectively. 99/

Marshall's examination of the theoretical economic efficiency implications of these kinds of inconsistencies begins by first stating the familiar necessary condition for least cost production (viewed from society's vantage point), that

$$\frac{\frac{dQ}{dX_1}}{\frac{dQ}{dX_2}} = \frac{P_2}{P_1}$$

At the margin the ratio of the changes in output with respect to one unit changes in the inputs must equal the inverse price ratio.

98/ James C. Loughlin. "Cost-Sharing for Federal Water Resource Programs With Emphasis on Flood Protection," Water Resources Research, Vol. 6, No. 2, April 1970, p. 368.

99/ Ibid.

(where for any two techniques of providing flood control benefits, for example, Q represents units of project output, X_1 and X_2 represent units of the two techniques, and P_1 and P_2 are the social costs per unit of techniques X_1 and X_2, respectively).

He then shows that with different proportions of costs required to be paid by a locality, for different means of achieving a given level of flood damage reduction, the locality will want to maximize local benefits (B_2) subject to a budget constraint (L), and in view of the proportion of total costs of the different techniques which the locality would be required to supply (these proportions are designated a_1 and a_2 in this example). With λ as the Lagrange Multiplier, the decision for the locality effectively becomes one of maximization of the expression

$$BL(Q) - \lambda(L - a_1P_1X_1 - a_2P_2X_2).$$

Setting the partial derivatives of this expression with respect to each technique equal to zero, the resulting expressions,

$$(dBL/dQ)(\partial/\partial X_1) - \lambda\ a_1P_1 = 0$$

and

$$(dBL/dQ)(\partial Q/\partial X_2) - \lambda\ a_2P_2 = 0,$$

translate into the conditions necessary for maximization from the point of view of the locality, expressed in the equation

$$(\partial Q/\partial X_1)/(\partial Q/\partial X_2) = a_1P_1/a_2P_2.$$

Comparison of this to the above conditional equation for social optimality, a_1 should equal a_2 in order for locally viewed optimization to coincide with the socially viewed optimum. In other words, the indication is that local requirements for cost sharing should be identical for different means of achieving the same end. To the extent that a locality seeks to maximize efficiency benefits accruing within its jurisdiction, Marshall's analytical scenario suggests that a condition of inequality between a_1 and a_2 encourages the locality to choose amounts of X_1 and X_2 that are either more or less than the amounts which the condition for a socially viewed optimum would prescribe (hence resulting in something less than the social optimum).

The second case Marshall examines deals with the effect which local requirements for cost sharing have on the selection of the scale of a project chosen to provide a particular purpose. Examples are selection of an optimal size dam height for a flood control reservoir, or determination of the optimal dimensions of a local flood protection levee system. From society's point of view, the condition for optimality is expressed by the equation

$$dB/dQ = dC/dQ$$

(where B represents total benefits accruing to society and is functionally determined by Q, the amount of project output; and C represents total costs to society).

On the other hand, a locality, maximizing net benefits for itself, will choose a scale of project design which approximates the condition of equality between marginal benefits it receives and costs it incurs at the margin -- ie.,

$$dBL/dQ = dCL/dQ$$

(where BL represents benefits accruing locally and CL represents costs incurred locally through the applicable cost sharing rule). In that marginal benefits accruing locally can be thought of as some proportion k of marginal benefits accruing to the whole of society, and likewise that marginal costs borne locally can be thought of as some proportion n of marginal social costs, the maximization condition viewed locally can be alternatively expressed as

$$k(dB/dQ) = n(dC/dQ).$$

The implication drawn for economic efficiency is that cost shares imposed locally should be in proportion (at the margin) to locally accruing marginal benefits effected by the project (ie., k = n), in order to promote selection of the socially viewed optimal scale.

Some Institutional Considerations

The analytical framework, elucidated above by Marshall, which seems to form the basis for the cost sharing recommendations of the 1973 National Water Commission, is solidly based in sound principles of microeconomics. Any critical discussion of the logic involved is beyond the scope of this paper. The efficacy of this model as an appropriate basis for policy formulation in this case, however, is not entirely self evident. The rather restrictive assumptions which accompany the competitive market model, a model whose workability seems implicit in the Water Commission's recommendations, must also hold for the theory to remain applicable in the case of water resources development projects and programs. The fact that some of the assumptions necessary for the analytics of the competition model to hold may not be strictly adhered to admittedly does not invalidate the theory. It is the rigor of the mathematical logic of the competitive market model which requires unfailing adherence to the assumptions. The crucial test for the model's validity, in terms of an examination of the assumptions, is whether the failure of adherence to them is fundamental, or merely a matter of degree. Some important examples of these assumptions are, generally:

a. vendability or marketability of products;

b. the absence of natural monopoly situations, and of significant externalities; and

c. the free and widespread availability of information.

An examination of the "nature" of the "environment" in which investment decisions are made seems to indicate that there is to some extent a fundamental departure from these assumptions. The point is that political-institutional considerations and imperfections in the "real world" where such policies would be imposed are very real constraints when considering the problem of translating such recommendations into operational reality. The following discussion attempts to place these kinds of constraints into perspective. While the various ideas on this topic are here factored out or singled out to some extent, for the purpose of discussion, it is important to bear in mind that there exists a great deal of interplay, and no one aspect can be dealt with in isolation, but only in full recognition of the existence of and interrelation with the others.

First of all, the water economy constitutes a complex system which offers a variety of goods and uses which vary as to their public or private nature over a wide spectrum. The potential offerings of this system are highly interrelated as well. In many cases, one use or one pattern of uses may in some way preclude others. In still other situations, different uses may be realized simultaneously. Simultaneous uses may be either strongly competitive, or may be characterized by compatibility. Examples of the former include the conflict that arises between use of a waterway to assimilate waste, and recreational use; and the competitive tension between the needs of anadromous fisheries, and storage systems for hydroelectric or flood control development. Examples of the latter include the simultaneous enjoyment of "consumptive" uses, such as water supply for domestic use or irrigation, and "non-consumptive" uses ("in-the-channel" uses which depend on flow, as distinguished from supply), such as navigation, waste disposal, recreation, fish and wildlife enhancement, or flood control. In a theoretical sense, these different use priorities can be left for determination to the market. For the consumptive uses, the assumptions necessary for an efficient resource allocation in a competitive market framework are more reasonably satisfied, but still in question. For example, water supply and hydroelectric power are vendable goods, whose benefits and costs can largely be appropriated to the users. In-the-channel uses are not so easily allocated in a competitive market situation, at least on an individual basis. Two obvious examples are flood control and secondary benefits stemming from irrigation or domestic water supply. Everyone protected by a particular flood control project is protected. Varying degrees of protection cannot be sold to individuals based on willingness and ability to pay. While primary use in the case of irrigation or domestic water supply may be reasonably "packageable" and marketable on an individual basis, the so-called "secondary" benefits are elusive and often widespread. The availability of water supply allows a community to prosper; increased return from land values derived from an irrigation project acts as a significant vehicle of the "multiplier" effect in portions of the local economy. 100/

100/ Most of the preceding discussion is drawn from Vincent Ostrom, "The Water Economy and Its Organization," Natural Resources Journal, Vol. 2, No. 1, April 1962, pp. 55-59.

In an abstract sense, it is perhaps argueable that even these latter kinds of benefits can be allocated on the basis of economic competition. Instead of single individuals, state and local governments, special districts, or other collective local entities may be thought of as playing the role of "consumer" in the market. Unfortunately, this is not an easy step, which the following observations will hopefully show. Localities vary in intensity as to their perceptions of a water problem. They are not so many atomistic units responding automatically to the pricing incentives of cost-sharing arrangements. The collective mind of the community may not only vary, but may diverge from the viewpoint which a national efficiency-oriented approach would prescribe. Presumably, water resources investments are undertaken pursuant to the goal of increasing the welfare of individuals. Implementation of a competitive market-oriented cost sharing policy, in which communities are treated abstractly as individual "actors" in a market, will not necessarily lead to an efficient allocation of resources (to say nothing of equity). Decisions, regarding the kinds of local expenditures required for a particular investment, result not only from the preferences and tastes of the individuals of the community affected by the outcome (perhaps sometimes they don't at all), but also by the structure and process which underlies the making of the decisions in the first place. James Buchanan and Gordon Tullock treat this general concept in an interesting way.101/ Consider the curve labelled C in Figure 1.102/

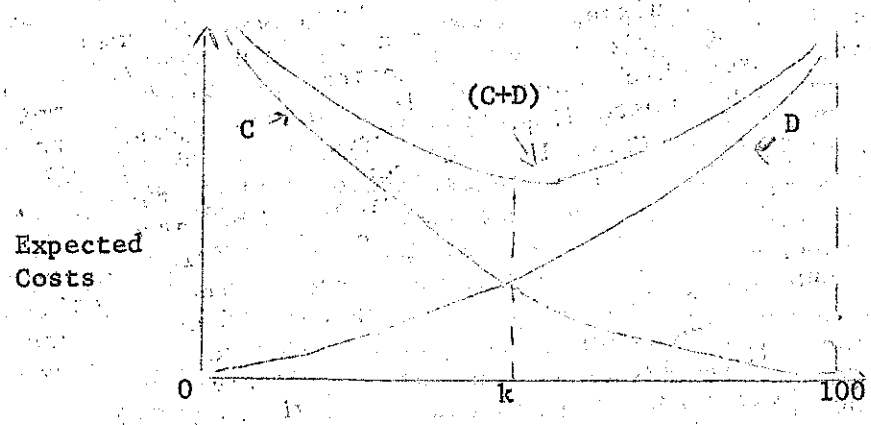

Figure 1.

Percentage of Individuals in Community Required to Take Part in Collective Determination of Decision

This curve represents the relationship, generally, between expected "political externality costs," and the percentage of individuals required to be involved in making the community's decision. Political externality costs are those costs which are incurred by individuals who have not participated and who disagree with the outcome. Conceptually, these

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101/ James M. Buchanan and Gordon Tullock. The Calculus of Consent -- Logical Foundations of Constitutional Democracy (Ann Arbor, Michigan: The University of Michigan Press, 1971), pp. 63-84.

102/ Ibid., p. 65.

costs are higher when community action is decided by fewer members of the community, decreasing to zero when 100 percent of the community must agree on a course of action.

Similarly, curve D in Figure 1 relates decision making costs to the percentage of the community required to be involved in the process. 103/ The general nature of the relationship, of course, is that the more individuals involved, the greater will be the costs of arriving at a decision. The curve labelled (C+D), represented by the summation of C and D, represents the total expected costs arising out of community decision making, expressed conceptually as a function of the percentage of individuals in the community required to make a collective decision.104/ The point of all this is, first, that an optimum decision making rule is suggested (depicted in the general case of Figure 1 by k precent), where (C+D) is at a minimum. More importantly, there is nothing to suggest that the minima and the k values will not vary among and between different groups and/or different decisions. Furthermore, policy governing decision making may dictate a non-optimal k value, as well.

Chapter V -- A Simple Market Model is Inadequate

As we have seen, the Commission implicitly bases many of its recommendations on a competitive market model of the American economy. The principle espoused is that the beneficiary should pay, presumably in proportion to his benefit at the margin -- just as a price would operate in an effective market model. The notion is that such a principle will lead to an efficient and optimum allocation between (1) different water uses and (2) between water and all other expenditures (schools, roads, factories, etc.).

The competitive market model has served this nation well. Nevertheless, economists and political decision makers have consistently recognized that the model does not always work as well as we would like.

Therefore, it is appropriate to review in greater detail the many reasons why the model might not lead to the best of possible worlds, especially as applied to water related problems.

Public Goods

In order for the competitive market model to work -- ie., to optimize the allocation of resources -- the product must be marketable. In order for a good to be marketable, the producer must be able to exclude from its use and enjoyment all those who refuse to pay the price. A public

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103/ Ibid., p. 70.

104/ Ibid., p. 71.

good is one where such exclusion is impossible or difficult. National defense is often cited as an example of a public good. Flood control is also a public good. A levee protects equally those who want it and those who do not. Engineering dictates that the same level of protection be provided to my neighbor as to myself. He cannot have a 100-year channel and I a 25-year levee. The resolution must be collective; it cannot be individual. Hence, the market model must be modified to apply to flood control. The problems of collective decision making must be satisfactorily taken into account or some other model devised.

The National Water Commission recommends that the states bear the cost of flood protection. This recommendation does not sufficiently approximate the market model to give us hope that an optimum expenditure on flood control will result. The state may be in little better position than the federal government to exclude those individuals who refuse to pay from the use of the protective devices.

The situation is the equivalent of asking a person to spend $9,000 for a new car knowing that two other people will get a car for free. Obviously, a lot less cars will be sold than if each buyer must pay $3,000 for a new car (assuming the marginal cost in either case is $3,000). Some indeed will be sold for $9,000, but not very many. Similarly, some flood control would be produced under the beneficiary pays principle, but not an optimum.

The point here is that there is no easy way to force flood control into a meaningful competitive market model. As a result, the manifestations of the public good -- or marketability -- problem will remain, no matter where financial responsibility is placed: private, local, state or federal. These manifestations are well known. There is the "hold out" problem. A hold-out is one who refuses to pay his share, hoping that others will pay for the entire project. The hold-out thus gets a free good -- because he cannot be excluded from use and enjoyment. The organizational component of a public good problem is that those desiring the good will not organize to produce it, knowing that hold-outs will exist. Another manifestation of non-marketability is discord over quantity of flood control. Since only one quantity can be provided for an area, discord and debate among consumers cannot be resolved in the market place. A public choice is needed. The closer this choice is to the people affected, the more likely the hold-outs will dilute the support for the project and hence its scale and effectiveness will suffer. While some local cost sharing is certainly necessary to discourage mindless raids on the Federal Treasury, full local cost sharing will lead to underinvestment.

Congress has shown remarkable awareness of flood control as a public good; hence, for example, Congress has provided different cost sharing between reservoirs and local protection works. This "inconsistency" as the National Water Commission views it, is made understandable when the collective decision making problem is faced squarely. Hold-outs are more likely when more jurisdictions and people are involved; hence, in order to induce needed protection, different cost sharing is reasonable.

None of what we have said is meant to imply that a hard look at flood control cost sharing is not in order. The sole purpose is to show that the basis for the hard look should not be a simplistic economic model which experts have long recognized does not apply to flood control.

Finally, there are other water projects which are public goods; ie., not marketable. Some of these are not as purely public goods as flood control. These include: low flow augmentation, navigation, beach erosion and recreation.

Natural Monopolies

The competitive model requires numerous producers of a given product. Sometimes, however, economies of scale are such that efficiency dictates production by one firm. This is the natural monopoly situation. One firm dominates the market for a given product. The key notion is that once the activity takes place at all, the cost of servicing additional customers is very small.105/ Left to its own devices, the private sector would create a monopoly or oligopoly, wherein prices do not reflect value (marginal costs). Hence, competition cannot lead to the best of possible worlds.

The major example of a natural monopoly in the water resources field is inland waterways. The National Water Commission's recommendations that users pay the average cost would lead to underutilization of the nation's waterways. This is because there would still be many who could use the waterway at little increase in overall system costs. In other words, they could bear the marginal cost of their use, which is all the competitive model usually requires. However, the additional uses could not bear the much larger average costs of the system.106/ In addition, the situation worsens as potential users drop out. This is because the average cost rises rapidly as users decrease in number; ultimately, total nonuse is possible.

It would be nice if the competitive model covered every situation neatly. Unfortunately, natural monopolies just don't fit. So we have compromised. First, we measure the benefits in order to limit the scope of our undertaking. But then we are not so foolish as to try to collect

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105/ To economists the key notion is that the producer is faced with a downward sloping demand curve; ie., the output of the producer affects the market price.

106/ As a technical aside, the private enterprise solution is a natural monopoly practicing discriminatory pricing. The National Water Commission does not recommend discriminatory pricing. Discriminatory pricing means a different price for each user. In order to work very detailed information on benefits (revenues) to each user must be generated. An administrative might more about the benefits to each user would result.

either the benefits or the average costs, because such an attempt would lead to inefficiency, not efficiency.

Externalities

A market transaction is ideally supposed to affect only the buyer and the seller. This means that there must be no effects which are not compensated. The seller must fully pay for all the factors of production; i.e., all the capital, labor and other resources used to produce the product. The buyers' use of the product should likewise affect no other party, either beneficially or adversely, unless appropriate compensation is made. Water is singularly difficult to isolate into single buyer-seller transactions. Water, after all, flows downhill -- and underground. Each use affects many users and potential users. The problem is compounded because many of the structures and management techniques used by resource planners will also generate both positive and negative externalities.

Consider, for example, navigation training dykes along the Missouri River. Suppose further that the training dykes affect hydraulic resistance, thereby raising flood peaks. At the same time the dykes greatly stabilize banks, lessening erosion, thereby making swimming in the Big Muddy more enjoyable. In addition certain secondary[107/] commerce, agriculture and industry are induced to move into areas along the river. Certain fish, wildlife and vegetation are adversely affected; others are benefited. Further assume that these impacts -- all from a simple "one-purpose" structure -- occur differentially as between jurisdictions: local, state, rural-urban.

Impose over this setting a requirement that the beneficiary pay. Assume that, indeed a sponsor -- some benefited city harbor authority -- is formed. What shall the sponsors pay for? If payment is limited to the costs of the project (including mitigation where quantifiable), then several non-quantifiable externalities will be left out of the sponsor's determinations. The issue goes further, however. Consider the adverse flood effects. What mitigation is to be envisioned and what is expected of the sponsor? Perhaps a levee might be appropriate mitigation, but suppose the levee is not justified. Should a lump sum mitigation payment be made? If so, to whom? Each jurisdiction or each property owner? If the latter, must the old property owner warn any new buyer of the hazard? If not, the owner could collect a windfall, leaving the next purchaser with the full effect of the adverse externality.

In addition, the sponsor may be financing the project out of secondary benefits based on induced commerce, industry and agriculture. We can envision a project with virtually no national benefits but a large number of local or regional benefits. Such a project might well be able to meet the Commission's cost sharing criteria. However, we certainly

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107/ By "secondary" is meant a mere transfer from another region.

would not expect a state or local government to be much concerned about whether the funds to pay for a project came from another region or not. In other words, the principle of beneficiary pays might not promote national efficiency but regional transfers. This result is the exact opposite of the Commission's purpose and recommendations.

Finally, the sponsor would be producing some positive externalities; should the federal government force such beneficiaries to compensate the sponsor? The plot thickens if we realize that improved recreational swimming and fishing are in the nature of a public good: it is difficult to exclude the beneficiaries from use and enjoyment. How then is compensation to be made?

The above example assumes that all of the effects of the one purpose project are known and the beneficiaries are reasonably identifiable. The best cost sharing solution, even under such optimum conditions, is not obvious. Superimpose several multipurpose projects, and several different types of programs related to water, each with their own interrelated set of positive and negative external effects. Add that full knowledge of all effects is not always known -- either in physical, economic or social terms -- so that we are dealing with a range of possibilities and that water development and management is inherently a long term proposition with attendant uncertainties. These considerations give a mere flavoring of the theoretical and practical problems associated with the beneficiary pays principle.

Common Property

This term is generally used to describe a resource whose use cannot be excluded from other users. It is similar to a public good, except that a resource (like fish or water) is involved and not a product (like flood control or national defense). The danger associated with a common property resource is overuse. This overuse results because none of the users equates the overall marginal cost of resource use to overall marginal revenue. Commercial fisheries, sport fisheries, wilderness areas and recreation areas are likely to be overused in the absence of public management of some sort.

Two distinct problems arise in terms of proper management. The first and more basic is to assure that the resource is not permanently destroyed or impaired; examples are "sustained yield" concepts used in timber management and fishery management. The second is to insure that economic resources are not overexpended on common property exploitation; to the extent that overexpenditure occurs, economic resources are taken from more productive uses elsewhere in the economy. It is far more important to accomplish the first objective than the second. The first insures maintenance of the resource for future generations. The first is usually amenable to regulatory control and can be determined on a physical basis. The second requires much more detail on costs and profits; rate setting becomes necessary. In addition, some of the values inherent in a common resource are often non-quantifiable (wilderness area enjoyment, for example). Finally, user charges for a common resource

often raise distributional questions. Oversimplifying: rich people can get to outlining wilderness and recreation areas; poor people often cannot. A user charge accentuates the difference.

In summary, wise management of a common property resource should be geared primarily to the maintenance of the resource substantially unimpaired. To this end, user charges of some sort may be appropriate or not, depending on the nature of the resource, number and type of competing uses, distributional effects and the greater or lesser existence of quantifiable values from each use.

Other Market Imperfections

There are three further problems with the market model as applied to water resource use and management. These three problems are: (1) the market discounts too heavily future values; (2) the market discounts too heavily, and fails to reflect, changes in technology and taste; and (3) the market does not produce a sufficient quantity of non-monetary values. These problems should be conceived of as a set of empirical observations rather than theoretically derived limitations, such as natural monopolies, public goods, externalities and common property. In some cases, one or more of the theoretical limitations may partially explain the empirical observation. But other factors, such as shortsightedness of private investors, risk, and lack of knowledge of scientific advances, are also important.

Whatever the reasons, market discount of future values is observable in undersized private or local dams and reservoirs, which have often preempted desirable sites. A related problem of uneconomic cost cutting was brought home at Buffalo Creek last year and in the passage of the Dam Safety Act; similar evidence is provided under P.L. 97 and 874 expenditures for local and private levees and reservoirs.

Environmental goods are adversely affected. Such goods are likely to increase in value in the future because they will become rarer, are unique and cannot be replaced. It should be noted that the Pinchot type of conservation was in large measure a response to this type of market failure. For example, the fear that current profits would lead to "overcutting" of the forests led to the notion of "sustained yield;" in other words, the market was feared to overrate current profits and underrate future profits.

One of the reasons that the market underrates future profits is the risk or uncertainty associated with these "profits" (or benefits). Federal involvement spreads the risk more fully than either private or local involvement. Undoubtedly, this "deep pocket" approach leads to some "overbuilding" and a few "white elephants," just as with large private corporations. But it is difficult to argue that the overall level of water resource expenditures by the federal government has gotten out of hand. Could we have expected that local and private financing would have produced the flood control measures necessary to at least partially control the 1973 floods along the Mississippi and Missouri Rivers? We think not.

Future changes in technology and taste are also likely to escape the workings of the private market. As a result, resources may be exploited unnecessarily -- a new technology might have saved the resource. Fusion and solar energy may provide a basis for going slow in fission and fossil energy exploitation, but it is not likely that the private market would recognize the possibility. In any event, a large role for the federal government in research and development, as well as fostering demonstration projects for promising new technologies, is appropriate.

Finally, non-monetary values tend to be more underrated in the market place than in public projects. In the latter case, environmentalists and others are likely to have a greater opportunity to voice their concerns. A somewhat more comprehensive view of value and worth is likely in the public sector. The problem which the beneficiary pays principle poses is that there is no way to repay in money many environmental costs of projects. Yet such costs -- such as damming the Grand Canyon -- may be the most severe costs of all, the costs which society is least likely to want to bear. The "discipline of the market" cannot act to preserve and enhance non-monetary values. Other, non-market arenas, such as Congress, must become involved for wilderness protection, scenic rivers, endangered species and other non-monetary considerations.

Income Distribution

Economists are fond of warning that the market mechanism is efficient but that the distribution of wealth may not always be what we would like. Some people just may not get much from the "system." Distribution problems may be either (1) spatial or regional, or (2) aspatial or between different income groups. The Commission discusses only the former and concludes that such problems should be handled outside of the water agencies. We shall discuss specific recommendations later in this report. For now, however, it is merely necessary to point out that the beneficiary pays principle favors those who can pay. The distribution of the current economic system has often been judged inappropriate by the people speaking through their representatives. Impartial or blind adherence to the Commission's repayment principle would tend to perpetuate such mal-distribution.

There are several areas where the linkage between water development and distribution of wealth is strong. In such cases, modified cost sharing -- approved by Congress, of course -- is both appropriate and justifiable. Examples include irrigation water for Indians, urban recreation, urban environmental enhancement and pollution control, depressed area development, flood control and drainage associated with model cities and urban renewal, and a few small boat harbors.

We have placed the distributional issue last, not because it is least important, but because we should first understand the enormity of the exceptions to the market model in the water management field. Because the model is deficient in its own terms, a stronger case for explicit consideration of the distributional results of water projects and cost sharing is made out.

Summary

We have discussed eight categories of market "failures:" public goods, natural monopolies, externalities, common property, future value (and risk), technology change (and knowledge), non-monetary values. There is considerable overlap among categories. These exceptions to the simplistic economic model of the Commission are profound and pervasive. There are few water uses, water programs or water management approaches which fail to embody several of the exceptions. The exceptions become the rule.

We do not contend that the mere existence of market failure justifies public intervention in general nor federal intervention in particular. We believe that public intervention is, and should be, legitimized by the political process. Once legitimized, however, the purpose of the intervention should not be subverted by cost sharing policies which are based upon free market considerations which do not apply. For example, the political process has determined that the market will not produce an optimum quantity of flood control. Flood control is a public good, risk and uncertainty are involved and pay-offs are often in the future. Individuals discount the future excessively. Local governments only a little less so. If the beneficiary must pay the full costs, we insure that an optimum quantity will not be produced. Hold-outs are bound to occur. If one jurisdiction wants the protection badly enough to pay for it, a positive externality will result to other areas which inherently must also be protected. Each jurisdiction and each person will want different levels of protection. Endless debate over who really benefits and who caused the problem originally will ensue.[108/] Agreement will be difficult to achieve. In effect, the very reason for government involvement -- underproduction -- will assert itself anew through an unwise cost sharing arrangement.

We turn now to an alternative approach to cost sharing problems. This approach is based in part upon the market imperfections discussed above; and in part upon the political and organizational theories and practicalities which the Commission has failed to adequately consider. Our approach is:

1. The need for water resource programs and the strategies for implementing them should be established by the political processes of the nation that involve interaction between all three basic levels of American Government. Cost sharing should not be used as a device for determining whether a given program should be undertaken. The Commission believes that some of the traditional programs should not be undertaken or continued. Whether such programs should be undertaken should not be subject to the beneficiary pays principle. That principle will indeed result in fewer of the traditional programs. This is because the market failures which gave rise to the federal programs will simply reassert themselves, resulting in underproduction.

108/ Suppose part of the problem is loss of upland cover or upstream channel encroachment.

2. Once the political process has established the need for an increase or decrease in a given program or a given strategy, cost sharing appropriate to implementing the program or strategy should be undertaken. For example, the Commission indicates in Chapter 5 that greater use of flood plain management strategies are needed in the flood control field. This being the case, it is appropriate for Congress to devise the "carrots and sticks" needed to implement wise flood plain management. Among these incentives should be new cost sharing arrangements. Full consideration should be given to the economic, political, organizational and equity nature of the problem and solutions, including the extent of future and non-monetary values, the number of jurisdictions involved, the need for coordination of solutions, distributional effects, and the ability to identify beneficiaries.

3. Central to the approach is the need for a clear understanding of what is hoped to be accomplished by federal cost sharing and other incentives as they pertain to a specific program or strategy. Only in this manner can we monitor the effectiveness of the incentives and, from time to time, make such adjustments as appear necessary. For example, suppose as was the case in the Water Resources Planning Act of 1965 it is determined that greater state participation is needed in river basin planning. A system of federal planning grants to states is made and various Title II commissions set up. Suppose further that the program does not seem to be working: states still do not appear to be sufficiently participating. A change is needed. The possibilities include: (1) dropping the program all together; (2) increasing the grants; and/or (3) establishing other incentives such as giving commissions some control over the allocation of federal planning and/or implementation funds.

We believe that the three step approach outlined above is in fact how cost sharing and other incentives have been approached historically by the Congress. One of the important tasks of the National Water Commission should have been an assessment of the nation's programs and strategies, their relationship to cost sharing and a report on needed modifications (1) to accommodate changing needs and new strategies and (2) to eliminate cost sharing which was not effective. We feel that the Commission has missed the mark by reliance on an inappropriate economic model and on a doctrinaire political model of state supremacy that failed to recognize the full opportunities for reshaping federal programs to really meet state needs.

In the absence of a systematic and appropriate reevaluation of cost sharing and related incentives, it is difficult to comment upon the specific recommendations of the Commission. We believe, however, that a sense of the results of the approach we are recommending can be obtained by offering tentative counter recommendations.

Before proceeding to our counter recommendations, we would like to comment upon the four "inconsistencies" in present cost sharing and the remedies offered by the Commission. We believe that the Commission has failed to tell us which of these "inconsistencies" are serious and which are trivial; ie., which are producing poor results and which merely offend a sense of symmetry. The four are:

1. Inconsistency among means (remedy: cost sharing should be consistent by purpose). This is a very serious problem because alternative strategies are often precluded due to cost sharing. For example, there is no federal cost sharing for many flood plain management strategies which appear to offer promise. The Commission presents the germ of a very important concept on pp. 14-20: "The authorized scope of an agency's approaches to project development should be broadened to permit alternative means of producing desired ends." Unfortunately, the Commission fails to apply this concept to most of its analysis of federal programs and not at all to cost sharing.

2. Inconsistency among agencies for similar purposes (remedy: consistency among agencies for same purpose). "Shopping around" is not per se bad, as it may provide interests multiple access to agencies and sharpen creative agency competition. In this light a variation in cost sharing is but one of many variations and rarely determinative. On whole, other studies have found this is a trivial and declining problem.

3. Inconsistency among water purposes (remedy: none presented). The Commission wisely recognizes that a single cost sharing percentage for all federal involvement is inappropriate. Unfortunately, this perception is not fully carried forth in the specific recommendations, where total repayment is called for (with a few minor exceptions). Different cost sharing for different purposes is entirely appropriate, depending upon the nature of the problem and potential solutions. Greater federal shares for flood control than for water supply is justified on public goods considerations expressed above.

4. Inconsistency among repayment arrangements (remedy: uniform repayment arrangements). The notion here is not to hide the "subsidy."[109/] It is submitted that this is a trivial problem which the Commission would not have raised but for its concern with the irrigation program of the Bureau of Reclamation. For example, recommendation 3, Chapter 16 calls for retention of the federal tax exemption on state and local bond interest, clearly a hidden "subsidy."

109/ We prefer the use of the word "incentive" to "subsidy." The latter implies getting something for nothing. Incentive implies a quid pro quo; ie., an attempt to overcome an economic, political or organizational barrier to solving a problem. Cost sharing should be a type of incentive.

Counter Recommendations Based on Market Failure Analysis

We turn now to the Commission's specific recommendations and our tentative counter recommendations for incentives, including cost sharing:

Municipal Water. We believe that the major current problems in the provision of municipal water from surface sources are: (a) waste due to underpricing of peak period and non-essential uses; (b) tendency by federal agencies to overbuild in order to meet local "draught" situations; and (c) lack of coordinated emergency measures among many small water districts. To insure that water supplies are not wasted we recommend that any jurisdiction desiring federal assistance in water supply production must:

a. Have a plan providing for promoting the conservation of water, including where appropriate, a variable pricing scheme designed to discourage low grade uses and a publicity campaign to encourage water conservation. This proposal is far different than a beneficiary pays principle. Our proposal recognizes that the first glass of water is much more important than the third weekly car wash or summer lawn watering. The former should be cheap or even free; the latter very expensive, at least covering the costs of the capacity needed to meet the peak uses involved.

b. Provide, where possible, for severe draughts by contract and coordination with other basin transfer institutions, rather than by single basin supply-demand relationships. We believe that the approach of the NEWS study, for example, is wise and should be supported by appropriate incentives. In this manner environmental insult from large dams and reservoirs can be minimized in both the short and long run.

Further, we prefer current cost sharing to the Commission's recommendations. The differences are: The Commission would set a higher repayment rate of interest and the Commission would defer payment with interest instead of without. Attempts to encourage provision of water for future use is justified because local jurisdictions have often been extremely short-sighted, as we might expect from our discussion of future values and risk earlier. As a result, there are many undersized local reservoirs whose capacity has been rapidly used, thereby creating further shortages and preempting valuable sites. In addition, inclusion of water supply in a federal project is an attempt to encourage multi-purpose use of a reservoir and the water resource. This objective has been legitimized by prior Commissions and retains considerable validity. Finally, note that local shares are generally greater than the amount many local jurisdictions would expend for water supply on their own. This is because of the high safety factor built into federal reservoirs and because of the future value concern of the federal government.

Further incentives may be needed by way of cost sharing in order to induce appropriate local management techniques. At this time, however, a period of further experimentation with present cost sharing is appropriate.

Finally, insufficient attention has been paid to groundwater use. The federal government should participate in the planning and financing of groundwater management for water supply on the same basis as for surface water.

Irrigation Water. The federal water effort must shift from the rural and agricultural setting to the urban setting, where the greater and more pressing needs are. Further this shift must be accomplished in an orderly fashion and not in a precipitous one. To this end, national engineering competence must be preserved; a suitable productive capacity in agriculture must be maintained in order to support national defense policy and to allow for environmentally derived limitations on fertilizer and pesticide use; alternate uses of the West's waters including scenic uses, must be established and pursued; and the role and direction of national agricultural policy must be monitored for implications in terms of irrigation policy. Even with recent price increases there is little basis yet for retaining incentives to irrigation at the current level at least in the short run. Winning or opening the West is not any longer a high priority national water goal. Therefore, an increase in irrigation cost sharing and placing irrigated agriculture on the same basis as municipal water supply with a further reassessment of cost sharing at a future date is suggested.

A major exception to our recommendation for increased irrigation cost sharing is water for Indian irrigation. Several of the tribes sharply criticized the Commission for its recommendations on Indian Water Rights during public hearings. The Commission as a result reviewed its position on Indian Water Rights. In any event, Wounded Knee and other occurrences have placed the "Indian Problem" center stage nationally. Curiously enough, the Commission failed to recognize that water may well be one of the solutions to this national problem. Repeatedly, Indians testifying before the Commission emphasized the importance of: (1) quantifying and retaining their treaty rights to water, and of (2) the need to assistance in actually developing and utilizing these rights. Surely it is reasonable to use the Bureau of Reclamation's engineering competence to assist in the development and use of Indian water rights for those tribes which desire it. Therefore, we recommend full federal cost sharing for such projects and waiver of traditional benefit-cost requirements on social and distributive grounds.

Navigation. Major changes in navigation cost sharing should be undertaken only as part of a National Transportation Policy and in full consideration of the natural monopoly and multi-purpose aspects of navigation improvements. Since increased use of waterways costs little incrementally, since many items moving by barge are of the low value, high bulk variety, since barge costs are low relative to other carriers, since low transport costs have played a major role in economic growth and national cohesiveness, and since repayment is likely to be based on regional transfer, we are opposed to the full repayment scheme of the Commission. Nevertheless, we realize that waterways are no longer the major transportation mode of the nation and that opening frontiers is of secondary importance. Therefore, we concur in an interim increase in navigation cost sharing to cover operations and maintenance of the

system. In addition, we recommend full federal cost sharing for capital outlays and maintenance associated with (1) avoidance of environmental insult, and (2) multi-purpose recreational use of waterways, in order to encourage sound and more comprehensive planning and project design.

Electric Power. Federal involvement should be based upon conditions similar to those for municipal water supply in order to avoid waste and environmental insult. We strongly agree with the principle of in-lieu taxes as set forth by the Commission. We would go further and allow power revenues to be used for negotiation purposes in assisting areas of origin. This is common practice for major utility companies, such as Con-Edison, and similar latitude should be allowed public administrators. Where the area of origin desires a water-related exchange, such as outdoor recreation, a boat harbor or irrigation, power (or water supply) revenues should be available to implement a negotiated agreement. This does not involve an increase in federal cost sharing; instead the allocated cost of the area of origin exchange should be added to the allocated power costs.

Water Based Recreation. The Commission recommends full repayment out of user charges of specific recreation costs; current cost sharing requires 50 percent repayment by a local sponsor. It is not clear that the Commission recognizes that it is recommending a departure from the normal current institutional arrangement. The Commission is apparently recommending federal management of water based recreation; currently a local sponsor must agree in advance to pay for the recreation component. There is some confusion as to the logic of Commission's departure from its basic principle of linking local desires to local repayment. Nevertheless, an expanded federal management role based on the following rationale is attractive. First, many local areas of origin have little management expertise or ability to gauge the actual likely returns from recreation. Hence, the element of risk looms large for locals but is minor for the federal government. In addition, recreationists may come from areas outside the local jurisdiction, so there is little local incentive to act except on a money-making basis; ie., non-monetary values are underrated. Relatedly, experience has shown that current recreation arrangements are often a major bottleneck to needed projects. Finally, note that preliminary demand estimates for recreation reservoirs have been notoriously low. This reflects the great increase in demand for water based recreation.

A goal of 100 percent monetary repayment out of user charges is unwise. Indeed, use of federal management agencies allows the institutional setting for a more flexible multi-purpose goals for water based recreation. Reservoirs close to urban areas should be encouraged, as should other forms of water based recreation and open space. Use of water based recreation facilities by the poor should be encouraged. Where overuse is a problem, non-market forms of rationing should be considered. However, peak use charges may be appropriate, as with power and water supply. User payment is at best a coequal goal with: (1) non-monetary values of recreation, (2) urban recreation and open space, and (3) distributive equity among income groups. Returns to reservoir recreation should be limited to 50 percent of costs and no reimbursements

should be made for urban and depressed area recreation and open space associated with local flood control, navigation and related projects up to 15 percent of original project costs. Finally, we endorse the current practice of full federal cost sharing for additional acreage for future recreation use for 10 years or until the management agency decides to use the acreage. Consistent with our comments on distributive equity we can find no rationale for anything less than full repayment with interest of small boat harbor costs associated, directly or indirectly, with privately owned, individual boats. Only the highest 10 percent of the population in terms of income can afford such boats; the nation has better uses for federal money.

Municipal Waste Collection and Treatment. Wastewater management is the single most pressing problem area in the water resources field. All of the efforts of local, state, regional and federal government will be necessary to restore and maintain the integrity of the nation's waters for ourselves and for future generations. A call now for the elimination of the construction grants program in 10 years is grossly premature. The battle has hardly begun and the Commission is calling for troup withdrawals. The "stick" of regulation is to be retained at least by the states, but the "carrot" of grants is to be discarded altogether. The Commission has sadly miscalculated the real needs of a massive government program to accomplish a goal with enormous public support -- perhaps even more enormous than that for the space program in its infancy. After debate and consideration Congress wisely rejected the total user charge approach, opting instead for a mix of grants and charges in the 1972 legislation.

The problem with the grants program has not been its existence but its ineffectiveness. This ineffectiveness is tied, not so much to funding timing and levels, as the Commission suggested, but rather to a lack of a quid pro quo for the grants. The quid pro quo must be effective planning and coordination of wastewater goals and hardware and of water development and use and water quality.

Flood Control, Drainage and Shoreline Protection. The crucial issue in flood control is whether an effective, unified, national program of flood plain management can be implemented. The Commission endorses such an approach, but its cost sharing proposals work in the opposite direction. It is unlikely that local entities or the states will undertake such programs without federal incentives. It is equally unlikely that the federal agencies will undertake such programs without a change in current cost sharing which provides for no federal cost sharing in many new and promising management techniques. The solution is to equate traditional cost sharing with cost sharing for new techniques with a large federal financial involvement. In addition, a requirement of a positive state or local program of land control to discourage unwise flood plain use is needed.

One simple example is the Prairie du Chien project of the Corps of Engineers. This is discussed in more detail elsewhere. The Corps proposed a non-structural alternative (evacuation, land purchase and recreation and open space use). A 20 percent local contribution was

recommended, based upon the average historical A-B-C's for the district involved. The report has been tied up in Washington's bureaucratic red tape although it is recognized in the current Rivers and Harbors Bill. Innovative and creative solutions such as this will go much further in remedying the current imbalances and defects in the flood control area than the beneficiary repayment principle. The latter will lead to use of flood plains without either structural protection or other flood plain management; the federal government will eventually pay in disaster relief expenditures (eg., the Agnes Relief Bill totalled $1.8 billion). The innovative solutions are there, but the Congress, OMB and other agencies must allow them to see the light of day by appropriate cost sharing and related incentives and by swift approval of creative projects.

In the area of flood control, we believe that local repayment should be waived where undertaken in conjubction with a model cities program and certain Appalachia programs. The normal benefit-cost criteria should also be waived. In this manner, the flood control program could be made more responsive and flexible in meeting other and perhaps higher national needs.

Finally, none of the above should be taken to involve an increase in overall federal expenditures on flood control. Rather, a substitution of funds from structural measures alone to more flood plain management strategies and to flood control in support of other national goals would be facilitated. In short, a meaningful national policy for flood plain management is the objective. Such a policy is long overdue.

Enhancing Environmental Values. We do not believe that enhancement of "common species of fish and wildlife" should be left primarily to local or state jurisdictions. A national problem is involved, the effects of which are sometimes most pronounced locally. We live in a highly mobile, highly interconnected society. It is important that a New York resident know that the ecology of California is being preserved; next year that New York resident may live in California or send his children to school there. In addition, environmental groups are likely to have more influence at the national level than at the local or even state level.

Therefore, federal agencies should have the authority to encourage environmental enhancement growing out of their traditional roles and projects. In order to encourage this enhancement, we recommend full federal cost sharing of environmental modifications up to 15 percent of basic project costs. Such cost sharing should be applied over and above mere mitigation and should include not only fish and wildlife but also historic and archeological site preservation, open space, urban environmental enhancement and ecological systems in general.

Regional Development. The water agencies should be encouraged to assist the nation in dealing with distributive problems. Such problems may be spatial or aspatial or both. The purpose is to insure responsiveness to the nation's larger needs. Where water development is closely linked to a distributive goal, such as in certain model city programs, relaxation of normal cost sharing is appropriate to encourage interagency cooperation; eg., HUD and Corps.

As with environmental enhancement, mere cost sharing is not sufficient. Coordinated planning at the agency and local levels is needed. New institutional forms may be involved (eg., the RRC's development districts). Where such coordination has been carried out -- and it will not be easy -- cost sharing should not be allowed to act as a barrier.

Low Flow Augmentation. The low flow augmentation program has not proceeded smoothly. This is due in part to a fear that it would be used in place of traditional treatment works, thereby allowing the polluter to continue polluting, and, in part, to EPA's objections to the technique. The 1972 legislation casts low flow augmentation in a new light. National emissions standards are established, calling ultimately for the best available technology for point sources, with costs to be taken into account. Low flow augmentation should therefore be viewed as an attempt to improve water quality where (1) point source degradation cannot be controlled even by the best available process and waste treatment technology; and (2) where non-point sources are degrading water quality (eg., urban or agricultural runoff). Even in these cases, we must recognize that low flow augmentation is not very helpful against classes of pollutants which the natural water processes cannot degrade; eg., certain pesticides, synthetic organics, viruses, and heavy metals. Therefore, low flow augmentation should be considered only where the non-point source and residual point source pollution by degradable pollutants are major problems. In addition an appropriate pollution control agency, such as EPA or a state or regional equivalent should make the determination of whether low flow augmentation is the best means of achieving higher water quality.

We recommend total or at least primary federal cost sharing where it is determined that low flow augmentation is the preferred technique for increasing water quality beyond the quality obtainable under the emission standards of the 1972 legislation. This is because neither the sources of pollution nor the beneficiaries are likely to be either identifiable or chargeable. The externality nature of the problem and the public good nature of the solution contend against any attempts to impose the beneficiary pays principle.

Our discussion of Chapter 15 emphasized the money collection problems associated with a beneficiary pays principle. The thrust of our argument was that water and water strategies cannot be efficiently allocated by a free-market model nor does return of financing to states and other non-federal agencies sufficiently approximate a free market model to engender a priori faith that efficiency would occur.

The Commission's view of economics is reflected in another guise in Chapter 3. The Commission argues that price is the equivalent of value and that the price of water in different uses can be technically simulated, though not directly observed. Therefore, the simulated price of water should be a major decision-making tool in water allocation (recommendations 1-3, p. 3-19).[110/] Price is indeed the equivalent of

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110/ Actually the Commission goes even further. Even where a direct simulation is not possible (aesthetics), a second order systems evaluation is possible to imply a simulated price.

exchange value given a competitive free-market model if not value in use. The Commission recognizes that water is not exactly a free-market good, but feels the price of water can be simulated in such a way as to make it the equivalent of a free market price and hence equal to true value. The specific techniques chosen leave much to be desired, although we have no doubt they are the best available. For example, the price for irrigation is based on producer surplus; for power, the cost of the next best alternative -- ie., private monopoly prices; for recreation, consumer surplus; etc. None of these prices are equivalent to exchange value in the market model sense. In addition, the solutions to water problems are often themselves not the product of a perfect or even nearly perfect prices. Consider labor rates distorted by unions. Shall we simulate the "real cost" of labor and thereby have lower economic costs than the actual cost of the project.

We submit that the only thing that the "economic values" have in common is that a dollar sign is placed in front of them. Price does not equal value in the water resources field. Certainly economic evaluations are critical to wise decision making. Such evaluations may show where gross distortions are arising, may suggest alternatives not readily apparent otherwise, and may illuminate the stake that a particular interest group actually has in a proposal.[111] But this is a far cry from elevating "economic values" to a primary position in water resources planning.

We turn now to Chapter 7c, "Pricing as A Means of Motivating Better Use." We offer two preliminary observations. First, some goods and services are more amenable to a political than to an economic allocation. We believe water is one good where the former should predominate. Second, we raise the question of why reliance on market simulating pricing has not been the primary allocation tool used by the nation on its waters. We suggest that the reason is a general perception and consensus that such pricing would not achieve the goals and objectives of society.

Nevertheless we believe that pricing can and should play a role in implementing political decisions about water use. We can all agree that if the price of something is raised, the amount purchased will decline to a greater or lesser extent. Hence, if we want to discourage a use, we can price it high. Other means, such as rationing, are also possible and these should also be used in implementing political decisions.

For reasons stated earlier, we do not believe in full cost pricing nor in market-simulation pricing. But we do agree that pricing is a tool and find common ground with the Commission when it states as a concession to potential critics, "The Commission is primarily concerned about allocation of resources at the margin, that is, the last increments of use." We, too, are concerned with the increments of water and power

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111/ For example, local supporters often have an inflated sense of the impact of construction of a civil works on sales and employment in their area. Therefore, economic analysis of "secondary benefits" makes sense even though not included in the B/C ratio.

which are seldom used but very "expensive." We find that expense to be not only economic but, even more so, environmental. We find that electric toothbrushes and extensive car washing are not worth a Grand Canyon, a Storm King Mountain or even a Lake Cayuga. We have no compulsion about setting last increment water and sewerage charges in excess of "full costs" because we believe that the full costs cannot be measured in dollars. We remind the Commission that its charge to give consideration "to conservation and more efficient use of existing supplies ..." grew primarily out of concerns by environmentalists and areas of origin, not economists.

Our recommendations on water supply, power and irrigation for Chapter 15 embody, we believe, a more positive and flexible approach to pricing as a political tool than the Commission's recommendation #3. We therefore oppose the recommendation. We also feel that recommendations #1 and 2 rely too heavily on one political tool and are too doctrinaire. We prefer to recommend that water management agencies explore all techniques for avoiding the waste of resources, by pricing, rationing, land use controls, publicity campaigns, and related methods and that water management agencies present the results of their deliberations to appropriate legislative bodies for a political determination.