NATIONAL WATER RESOURCES POLICY ISSUES*

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I

INTRODUCTION

Governmental water resources policy has been subjected to particularly intensive scrutiny and debate during the past decade. The attention which it has received from special study groups, governmental agencies, congressional committees, and candidates for public office attests to the importance with which water resources policy issues have been viewed. Furthermore, during the same period, policies have been changing rapidly as a result of congressional enactments and modifications wrought through the daily operating decisions of federal administrators. In brief, the water resources policy field continues to seethe with activity, which makes analysis difficult and hazardous, but, nonetheless, valuable and interesting.

Water resources development programs embrace a wide range of objectives. Many of the goals have not been explicitly defined; some have become unusually controversial. This paper has been prepared on the premise that an effort to define the issues and compare the positions which have been taken on them will contribute to an understanding of water resources policy problems. More specifically, through an analysis of laws and actions indicative of existing national policy and of the recommendations included in five of the recent policy reports, this paper seeks to accomplish the following:

1. Identify and define some of the significant water resources policy issues.
2. Compare existing federal practice and the recommendations set forth in the five reports, in order to determine the principal areas of agreement and disagreement.
3. Suggest the nature of the problems which must be overcome in order to resolve the issues and evolve a wise national water resources policy for the future.

The interpretation of existing practice is based upon laws, administrative directives and actions, and statements by public officials. The five study groups and their reports selected for comparison are:

* This paper is based upon an over-all study of water resources conducted under the aegis of Resources for the Future, Inc., which is to be published at a later date.

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PRESIDENT'S WATER RESOURCES POLICY COMM'N, A WATER POLICY FOR THE AMERICAN PEOPLE (1950) (hereinafter referred to as the Cooke Commission).

MISSOURI BASIN SURVEY COMM'N, MISSOURI: LAND, AND WATER (1953) (hereinafter referred to as the Survey Commission).

U. S. COMM'N ON ORGANIZATION OF THE EXECUTIVE BRANCH OF THE GOVERNMENT, REPORT (vol. 1, WATER RESOURCES AND POWER) (1955) (hereinafter referred to as the Second Hoover Commission).

U. S. COMM'N ON ORGANIZATION OF THE EXECUTIVE BRANCH OF THE GOVERNMENT, TASK FORCE REPORT ON WATER RESOURCES AND POWER (1955) (hereinafter referred to as the Task Force).

PRESIDENTIAL ADVISORY COMM. ON WATER RESOURCES POLICY, WATER RESOURCES POLICY (1955) (hereinafter referred to as the Advisory Committee).

A primary consideration in selecting the five reports for analysis was the contribution each might make to an understanding of current issues and the differing views which are held on national water resources policy. It was concluded that these official reports, prepared as they were under the auspices of both Democratic and Republican Administrations and reflecting a wide range of opinion, would serve this purpose quite well.[1] Both the majority report of the Second Hoover Commission and the Task Force report are included, because the latter elaborates upon many items covered only briefly or not at all in the Commission's own report.

The documents that deal with national water resources policy fail to provide a precise definition of the term. That suggested by Ackerman, ". . . a clear, accepted, reasonably stable body of principles which could be used for the guidance of United States water resources development in the public interest,"[2] most suitably fits the meaning of the term as used throughout this paper. However, the key words, "in the public interest"—a phrase that is open to many different interpretations—require further clarification.

This phrase, as applied to water resources policy, involves three concepts.[3] First, is the concept of economic efficiency, which implies that certain activities in the water resources field are undertaken in order to maximize the net economic returns (goods and services) to the nation as a whole. Where this is the objective, the water resources project or program selected would be the one among the available alternatives that would provide the largest net amount of goods and services to the nation.

The second concept involves objectives that cannot be measured in economic terms. The control of floods in a given instance may not maximize economic returns to the nation, but the security which control provides to the inhabitants of the floodplain may be considered to justify the cost. Navigation facilities may be uneconomic,

[1] In the more complete study on which this paper is based, the 1957 report on water policy by the Engineers Joint Council is also considered.

[2] Ackerman, *Questions for Designers of Future Water Policy*, 38 J. FARM ECON. 971 (1956).

[3] The author is indebted to Mr. John Krutilla for assistance in defining these concepts.

but needed for national defense. Water resources development has been undertaken to provide employment opportunities in time of depression, to raise living standards in depressed areas, and to foster the settlement of underdeveloped regions. In brief, it is evident that water resources development has been viewed as one means of helping to provide the economic opportunity, social security, and personal freedom accepted as among the goals of our democratic society. To identify this concept, the term "social and human values" is adopted in this paper.

The third concept involves the comparative efficiency of different institutional arrangements. Where both government agencies and private institutions theoretically can assure the attainment of a given set of objectives—involving either economic efficiency or social and human values—a question may arise as to which can, as a practical matter, conduct the program at the lowest cost. Also, this question may apply between different echelons of government (local, state, and federal) and between different systems of organization within a given echelon. What level of government or what pattern of organization can attain the objectives of the water resources development program at the least cost?

These concepts are seldom sharply defined in any given policy issue. Frequently, all three concepts—economic efficiency, social and human values, and institutional efficiency—are involved. Yet, they underlie the four practical questions which national water resources policy-makers usually consider—namely:[4]

1. What should be the objectives of water resources programs? To what extent do they involve the attainment of economic efficiency, and to what extent do they involve social and human values?
2. What should be the federal responsibility for undertaking water resources development? Assuming a given set of objectives, wherein is the federal government the superior institution to assure efficiency in the attainment of these objectives?
3. How should the costs of national water resources development be shared in light of social and human values and economic efficiency considerations?
4. Assuming a given set of objectives for the national water resources development program, what system of organization will assure the attainment of those objectives at the least cost?

The analysis which follows is concerned with only the first three questions, because the organization of national water resources development activities is the subject of a separate paper in this symposium.[5] These questions are considered as they apply to four water resources development purposes—namely, flood management, irrigation, power, and municipal and industrial water supply. In a compre-

[4] Many of the issues considered by the study groups involve procedural instead of policy questions. In fact, of the four questions cited, only the first one may be a true policy issue. In the case of the other three questions, the policy issues involve the guiding principles which underlie the possible answers rather than the questions themselves. Nevertheless, these four questions provide a practical basis for considering the differing views on water resources policy.

[5] Fessler, *National Water Resources Administration, supra* 444-71.

hensive analysis of national water resources policy, numerous other water resources activities would also be treated; but it is believed that those discussed here involve some of the most significant issues and adequately reflect the general nature of the water resources policy problems confronting the federal government.

II

FLOOD MANAGEMENT

Periodically, some part of the nation experiences devasting floods, like those that followed the hurricanes in the Northeast during the summer of 1955. Annually, large and small streams overflow their banks and damage crops, residences, and business establishments in floodplain areas. The Corps of Engineers estimates that there are:[6]

". . . unprevented losses of $420 million annually . . . ." in the main river and tributary valleys of the country in addition to the ". . . losses that occur in the smaller upstream tributaries estimated by the Department of Agriculture to aggregate about $300 million annually."

As Hoyt and Langbein have stated ". . . eventually nature demands its toll from these who occupy flood plains."[7]

A. Objectives of Flood Management

The objectives of flood-management activities are twofold. The first involves human and social values. The danger of floods threatens the security of floodplain occupants; when floods occur, public health may be impaired, lives lost, and investments in homes and businesses destroyed, causing incalculable personal hardship. These losses can be measured only partially in economic terms, although they have been major considerations in determining the kind and extent of flood-management activities which are undertaken. The second objective involves the concept of economic efficiency. Installations existing in floodplain areas are subject to damage, and the potential return from floodplain lands—either in the form of agricultural commodities or through other uses—is limited because of the threat of damage. Through what flood-management measures, individually or in combination, can the economic returns to the nation from use of floodplain areas be maximized?

To meet these two objectives—minimizing personal hardship resulting from floods, and maximizing the economic return from floodplain lands—four types of measures are undertaken, as follows:[8]

1. Floodplain use is limited to activities that will not result in inordinate losses when floods do occur. This is done either voluntarily or through governmental zoning of flood plains.

[6] 1 CHIEF OF ENGINEERS, U. S. ARMY, CIVIL WORKS ACTIVITIES, ANN. REP. vi (1955).

[7] WILLIAM G. HOYT AND WALTER B. LANGBEIN, FLOODS 4 (1955).

[8] For discussions of the flood-management problem, see GILBERT F. WHITE, HUMAN ADJUSTMENT TO FLOODS: A GEOGRAPHICAL APPROACH TO THE FLOOD PROBLEM IN THE UNITED STATES (1954); HOYT AND LANGBEIN, *op. cit. supra* note 7; LUNA LEOPOLD AND THOMAS MADDOCK, THE FLOOD CONTROL CONTROVERSY (1954).

2. Flood warnings are issued to permit persons and movable property to be evacuated from the paths of prospective floods.
3. Flood waters are confined to stream channels or special floodways, largely through structural measures, such as reservoirs for impounding flood waters, levees, deepening, widening and straightening of channels, etc. Also, under some conditions, land-treatment measures, such as terracing, contouring, strip-cropping, and improvement of vegetative cover, may reduce flood flows.
4. When floods do occur, individual distress may be alleviated through relief measures, or the costs may be distributed through insurance.

1. *Present Practice*

The objectives of federal flood-management activities have never been precisely defined. The statutes reflect a combination of economic and social objectives, without criteria establishing the extent to which each should govern. Thus, for example, the Flood Control Act of 1936 states:[9]

> . . . that the Federal government should improve or participate in the improvement of navigable waters or their tributaries, including watersheds thereof, for flood-control purposes if the benefits to whomsoever they may accrue are in excess of the estimated costs, and if the lives and social security of people are otherwise adversely affected.

It is, accordingly, safe to state that all federal flood-management activities have a combination of economic and social objectives, with some designed more specifically for one purpose than for another.

2. *Policy Recommended by Study Groups*

None of the five study group reports examines this issue. All assume a combination of economic and social objectives, without stating explicitly what they should be.

B. Federal Responsibility for Flood-Management

1. *Present Practice*

Initially, federal flood-control activities were associated with the development of navigation, and prior to 1936, they were largely localized in the Mississippi Valley. However, the Flood Control Act of 1936 marked a radical departure, declaring that ". . . flood control . . . is a proper activity of the Federal Government in cooperation with States, their political subdivisions, and localities thereof." To this end, it authorized the Corps of Engineers to undertake ". . . Federal investigations and improvements of rivers and other waterways for flood control and allied purposes . . ." and the Department of Agriculture to undertake ". . . Federal investigations of watershed and measures for run-off and waterflow retardation and soil erosion prevention. . . ."[10]

Today, the federal government has a large-scale flood-management program, with

[9] 49 STAT. 1570, 33 U.S.C. §701a (1952).
[10] *Ibid.*

many ramifications. The Corps of Engineers is actively engaged in the construction of flood-control works to protect the main river and tributary valleys. Flood-control storage is included in multiple-purpose reservoirs constructed by the Bureau of Reclamation. The Department of Agriculture, now operating under the Hope-Aiken Act,[11] has a nation-wide program for the reduction of flood damages in the upstream tributary valleys. The Weather Bureau maintains a flood-warning service. The Housing and Home Finance Agency has been directed to establish a flood-insurance program under the Federal Flood Insurance Act, which further provides that[12]

> After June 30, 1958, no insurance or reinsurance shall be issued . . . in any geographical location unless an appropriate public body shall have adopted and shall keep in effect such flood zoning restrictions, if any, as may be deemed necessary by the Administrator. . . .

And finally, the Office of Civilian Defense, the Corps of Engineers, and other federal agencies cooperate with state and local authorities in relieving distress when major floods occur.

Thus, the federal government is concerned with the construction of flood-control works from the upstream areas, through the major river valleys, to the sea, although the works built under the provisions of the Hope-Aiken Act are constructed by local organizations with federal funds on the basis of the technical advice and assistance of the Department of Agriculture. The flood-warning service is entirely a federal program. Floodplain zoning is considered to be a state and local responsibility, but, as indicated above, after June 30, 1958, issuance of federal flood insurance will be conditioned upon adoption of acceptable zoning regulations. Nevertheless, although the federal government has accepted responsibility for flood insurance, the law states that[13]

> In providing insurance or reinsurance under this chapter, the Administrator shall use to the maximum practicable extent the facilities and services of private organizations and persons authorized to engage in the insurance business under the laws of any State. . . .

Localities and individuals are, of course, consulted by the federal agencies, or, as in the case of the small watershed program, a local district undertakes the work with federal technical assistance. The states, moreover, review and comment on federal flood-control reports and are consulted while they are being prepared. And the states and localities have responsibility for floodplain zoning, although they have done little.[14] But, in short, the federal government is clearly the dominant level of government in the field of flood management.

[11] Watershed Protection and Flood Prevention Act, 68 STAT. 666 (1954), as amended, 70 STAT. 1088, 16 U.S.C. §§1001-07 (Supp. III, 1956).

[12] 70 STAT. 1082, 42 U.S.C. §2411(c) (Supp. III, 1956). Since the last session of Congress failed to appropriate funds to implement this act, however, the future of the federal flood insurance program is uncertain.

[13] Federal Flood Insurance Act, 70 STAT. 1082, 42 U.S.C. §2412(a) (Supp. III, 1956).

[14] See HOYT AND LANGBEIN, *op. cit. supra* note 7, at 95: "Flood zoning, like almost all that is virtuous, has great verbal support, but almost nothing has been done about it."

2. *Policy Recommended by Study Groups*

The five study group reports assume a large measure of federal responsibility for flood management, without defining just what it should be. Only the Task Force proposes a specific limitation on federal participation in structural control measures, stating ". . . that projects for the alleviation of local and intra-state flood problems, in general, be planned, constructed, operated, and maintained by local government units or by the States affected."[15] The Advisory Committee would encourage nonfederal development, as indicated by the following proposal:[16]

As an incentive to non-Federal construction of partnership projects having no vendible products, the Federal Government should increase by 10 percent the amount which it would contribute under the proposed general cost-sharing procedure if the project were to be built by the Federal Government.

Also, it proposes that the federal government make or guarantee loans to state and local bodies to construct water resources projects.[17] The Cooke Commission and the Survey Commission specify that floodplain zoning is the responsibility of state and local governments, but the Survey Commission suggests that the federal government ". . . require the enactment of State zoning legislation as a condition precedent to the initiation of federally constructed works."[18] None of the five reports considers flood insurance. On the basis of these reports, therefore, there appears to be relatively little objection to federal domination of the flood-management field.

C. Repayment of Flood-Management Costs

1. *Present Practice*

Federal cost-sharing policy for flood-management activities may be summarized as follows:

1. The cost of the flood-warning service provided by the Weather Bureau is borne entirely by the federal government.

2. For projects of the Corps of Engineers other than reservoirs, channel improvements, or channel rectification (largely levees), the federal government bears the full cost of construction, but local agencies agree to[19]

. . . (a) provide . . . all lands, easements, and rights-of-way necessary for the construction of the project . . . ; (b) hold and save the United States free from damages due to the construction works; (c) maintain and operate all the works after completion. . . .

[15] 1 U. S. COMM'N ON ORGANIZATION OF THE EXECUTIVE BRANCH OF THE GOVERNMENT, TASK FORCE REPORT ON WATER RESOURCES AND POWER [hereinafter cited as TASK FORCE REPORT] 99 (1955).

[16] PRESIDENTIAL ADVISORY COMM. ON WATER RESOURCES POLICY, WATER RESOURCES POLICY [hereinafter cited as ADVISORY COMM. REPORT] 35 (1955).

[17] *Ibid.*

[18] MISSOURI BASIN SURVEY COMM'N, MISSOURI: LAND AND WATER [hereinafter cited as SURVEY COMM'N REPORT] 18 (1953). *Cf.* 1 PRESIDENT'S WATER RESOURCES POLICY COMM'N, A WATER POLICY FOR THE AMERICAN PEOPLE [hereinafter cited at COOKE COMM'N REPORT] 145 (1950).

[19] Flood Control Act of 1936, 49 STAT. 1571, as amended, 61 STAT. 501 (1947), 33 U.S.C. §701c (1952).

3. For reservoirs, channel improvements, or channel rectifications constructed by the Corps of Engineers, the federal government bears the full cost of flood control, including the cost of operation and maintenance.[20]

4. For projects constructed under the Hope-Aiken Act, local organizations must provide lands, easements, or rights-of-way and arrange for defraying the cost of operation and maintenance, but construction costs "applicable to flood prevention and features relating thereto shall be borne by the Federal Government. . . ."[21]

5. Rates paid by policyholders for flood insurance are to be no less than sixty per cent of the rate ". . . which would be adequate . . . to pay all claims for probable losses over a reasonable period of years," and after June 30, 1959, each state is to bear one-half of the amount of the estimated subsidy for policies issued within the state.[22]

Thus, the cost of the flood-warning service is borne entirely by the federal government, and only a very small share of the costs of structural measures is borne by nonfederal interests. Moreover, flood insurance policy-holders may receive a subsidy as high as forty per cent of the estimated cost of the insurance, with one-half of the subsidy being borne by the states.

2. *Policy Recommended by Study Groups*

In considering cost-sharing policies applicable to flood management, the five study groups limit their attention to the financing of flood-control structures. The Cooke Commission states that local communities or special districts should assume ". . . an appropriate share of the cost. . . ."[23] The Survey Commission proposes that local beneficiaries ". . . should be assigned assessments up to the value of benefits . . . with allowance for incentives and repayment ability."[24] The Second Hoover Commission suggests that nonfederal interests should "share in financial responsibility in proportion to the benefits they receive."[25] The Task Force advocates that nonfederal beneficiaries ". . . assume not less than 50 per cent of the non-Federal costs."[26] The Advisory Committee does not make specific reference to repayment of flood-control costs, but in the discussion of cost-sharing policy, it states that "As a general principle, the share of the costs to be borne by the beneficiaries should be proportionate to the benefits received."[27] In short, the five study group reports agree unanimously that state and local interests should repay a much larger share of the cost of flood control than they do at the present time.

[20] It is reported that for some projects which would be authorized by the omnibus bill, S. 497, 85th Cong., 1st Sess. (1957), those realizing enhancement of land values as a result of the flood control would be required to repay part of the cost of the project above the amounts identified in items 2 and 3.

[21] Watershed Protection and Flood Prevention Act, 68 STAT. 667 (1954), as amended, 70 STAT. 1088, 16 U.S.C. §1004 (Supp. III, 1956).

[22] Federal Flood Insurance Act, 70 STAT. 1080, 42 U.S.C. §2406(a) (Supp. III, 1956).

[23] 1 COOKE COMM'N REPORT 85.

[24] SURVEY COMM'N REPORT 16.

[25] 1 U. S. COMM'N ON ORGANIZATION OF THE EXECUTIVE BRANCH OF THE GOVERNMENT, WATER RESOURCES AND POWER [hereinafter cited as SECOND HOOVER COMM'N REPORT] 74 (1955).

[26] 1 TASK FORCE REPORT 99.

[27] ADVISORY COMM. REPORT 27-30.

D. Flood-Management Policy Issues

Comparison of existing practice and recommended policies indicates that the objectives of flood management are not clearly defined by existing law and administrative directives or by the five study group reports.

The significance of this lack of clarity in objectives becomes apparent when one examines the structural-control programs of the Corps of Engineers and the Department of Agriculture. Both seek to reduce flood damages and improve the utility of floodplains. However, the basic objectives of the two agencies involve a substantial difference in emphasis. The Department of Agriculture aims to reduce the risk of farming in floodplain areas, and its program, therefore, emphasizes control of the smaller, more frequent floods. On the other hand, the program of the Corps of Engineers is largely the outgrowth of flood disasters, prevention of which remains a major objective.[28]

This difference in objectives is reflected in the practices of the two agencies. A policy statement by the Secretary of Agriculture provides that[29]

> . . . costs shall be less than primary benefits . . . Secondary and intangible benefits should not be used for economic justification. . . ."

This policy will result in the attainment of approximate economic efficiency in the use of floodplain lands if the benefit-cost estimates are reliable and if they are applied to each increment of a system. However, since the extremely large, disastrous floods may occur very infrequently in the same locality and since control of such floods may be very costly, control measures may not be justified on the basis of economic efficiency alone. In view of this consideration, it is the general practice of the Corps of Engineers to design structures of a size that will provide the maximum control attainable under a benefit-to-cost relationship of unity or better. Economists point out that this practice is inconsistent with the attainment of maximum economic efficiency, however, because increments of a given structure or system may have a benefit-to-cost relationship of less than unity. Where both the Corps of Engineers and the Department of Agriculture are considering plans which would provide a degree of protection to the same floodplain area, therefore, this difference in objectives may result in a conflict of views as to what magnitude of program is warranted. Fox and Picken have identified this difference in objectives as an important factor in the current upstream-downstream flood control controversy.[30]

[28] It is evident that the two agencies also have different bases of political support. The valley cities, the farmers with lands in the major floodplains which would be protected, and the contractors who build large structures provide much of the support for programs of the Corps of Engineers. The farmers with lands in the headwaters areas, those whose lands are threatened with inundation by large reservoirs, the merchants who serve these people, together with certain special groups, such as the fish and wildlife organizations, who feel that their interests are best served by upstream programs, provide the nucleus of support for the programs of the Department of Agriculture.

[29] SECRETARY OF AGRICULTURE, POLICY FOR THE ADMINISTRATION OF THE WATERSHED PROTECTION AND FLOOD PREVENTION ACT (1956).

[30] IRVING K. FOX AND ISABEL PICKEN, THE UPSTREAM-DOWNSTREAM FLOOD CONTROL CONTROVERSY IN THE ARKANSAS-WHITE-RED BASINS SURVEY (to be published).

Under an ideal system of flood management, structural measures, zoning, flood-warning, insurance, and relief measures would be utilized in such a combination that society would realize the most for its money in the way of economic and social returns. Costly structural control would not be provided if the same goals could be realized through less expensive zoning or flood forecasting. In most cases, a combination of measures would probably provide the optimum result. To arrive at such a combination, however, one must know what constitutes an "optimum result." Presumably benefits and costs expressed in monetary terms can be estimated so as to indicate the approximate economic efficiency of a given project. On the other hand, it is difficult to define what costs are justified by identifiable social and human values resulting from a project. Yet, such a judgment is necessary to an optimum program of flood management.

This comparison of existing practice and recommended policy has shown that in acting on cost-sharing policies applicable to flood-management activities, Congress has proceeded in a direction opposite to the course recommended by the study groups. By amending the Hope-Aiken Act so that the federal government pays the full cost of flood-control structures built under that act, practically all flood-control costs are now borne by the federal government. Existing federal practice for flood control poses more sharply than any other activity a basic reimbursement policy issue which is becoming increasingly significant as federal subsidization of water resources development continues to increase. The issue has two aspects which may be expressed as follows: (1) to what extent is it equitable to provide flood control for the benefit of floodplain occupants at the expense of the general taxpayer? and (2) to what extent is it administratively practicable to undertake a flood-management program of optimum efficiency when the beneficiaries bear such a small portion of the costs of the structural program, as is the case under present practice? In view of the recent amendment of the Hope-Aiken Act, it may be argued that these are academic questions as they apply to flood control. Nevertheless, they have important implications for all aspects of water resources development.

III

IRRIGATION

Although the general purpose of irrigation—to promote plant growth and thereby increase the economic returns from agriculture—is the same wherever irrigation is practiced, it is appropriate in this paper to distinguish between three different types of situations. Traditionally, irrigation is associated with the reclamation of arid and semiarid lands; application of water permits the cultivation of lands which may have been almost totally unproductive. The federal Reclamation Act of 1902[31] was designed primarily to foster irrigation in such areas. The second situation may be typified best by the Great Plains. In this region, dry-land farming is successful during wet climatic cycles, but there are periodic droughts that seriously reduce agri-

[31] 32 STAT. 388 (codified in scattered sections of 43 U.S.C.).

cultural production. Under these circumstances, irrigation of farm lands provides a more stable income to the farmer and a more stable economy to the immediate area. The third situation applies to the humid sections of the country—namely, the coastal area of the Pacific Northwest and most of the thirty-one eastern states. These areas may also suffer from droughts, and irrigation serves to reduce the farmer's losses which otherwise would result. Of more importance, even in years of so-called normal rainfall, precipitation does not always occur at the proper times and in the proper quantities to maximize plant growth. Thus, the scientific application of water to land in humid areas, even in nondrought periods, can increase crop yields significantly.

It is estimated that nearly 30,000,000 acres of land are irrigated in the United States, ninety-four per cent of which lay in the seventeen western states in 1950.[32] Federal irrigation projects supplied water to over 6,000,000 acres in 1955.[33] The federal government has fostered irrigation practices since passage of the Desert Land Act in 1877.[34] Although it originally confined its attentions to the seventeen western states, the federal government now is becoming involved in irrigation work throughout the humid East as well, where, stimulated in part at least by recent droughts, interest in irrigation has been growing rapidly.

A. Objectives of Irrigation

Provision of settlement opportunities has been an important objective of the federal irrigation program. The first Commissioner of Reclamation expressed this objective most emphatically in the following statement:[35]

> The object of the Reclamation Act is not so much to irrigate the land as it is to make homes. President Theodore Roosevelt in his message to this Congress today, and in every previous message to this Congress and to the Congress of the United States, has emphasized again and again that the primary objective of the law was to make homes. It is not to irrigate the lands which now belong to large corporations or to small ones; it is not to make these men wealthy; but it is to bring about a condition whereby that land shall be put into the hands of the small owner, whereby the man with a family can get enough land to support that family, to become a good citizen, and to have all the comforts and necessities which rightly belong to an American citizen.

A second objective is that of stabilizing the income of individuals and the economy of areas which suffer periodically from drought. This has been considered a primary objective in the Great Plains regions.

A third objective is that of providing the foundation for the economic development of underdeveloped areas of the nation. In the vast arid and semiarid regions of the West, irrigation projects provide the major basis for an agricultural economy,

[32] See 5 U. S. CENSUS OF AGRICULTURE, 1950 SPECIAL REPORTS, IRRIGATION pt. 7, at 3 (1952).

[33] See U. S. DEP'T OF THE INTERIOR ANN. REP. 15 (1956).

[34] 19 STAT. 377 (1877), 43 U.S.C. §§321-23 (1952).

[35] F. H. Newell's message to the National Irrigation Congress in 1905, as quoted in U. S. DEP'T OF THE INTERIOR, LAND OWNERSHIP SURVEY ON FEDERAL RECLAMATION PROJECTS 91 (1946).

which, in turn, gives rise to the growth of towns to handle the trade of the irrigated areas. Eventually, this may lead to the establishment of other types of industry.

Finally, irrigation is viewed as a means of increasing the production of food and fiber to meet the nation's rapidly growing demands for these commodities.

In analyzing these objectives, it should be recognized that the first two involve, to a very large extent, certain human and social considerations. Thus, society may decide that it is worth while to provide farm settlement opportunities for families, even though large corporate enterprises may be more economic. Similarly, it may decide that areas subject to drought should be assisted in coping with this problem, even if not justified by strictly economic considerations. And although the third objective of developing underdeveloped areas may be sought for reasons of economic efficiency, it may be sought for other purposes as well. Thus, on the one hand, development of such areas may promise a general improvement in the efficiency of the national economy; but on the other hand, the nation may decide to develop such areas in the interest of national defense or for other noneconomic reasons. The fourth objective of producing food and fiber to meet the nation's increasing needs, however, involves only the question of economic efficiency—and to the extent that this is the objective, the public interest dictates that only such irrigation activities be undertaken as are less costly than any of the available alternatives for attaining the same objective.

1. *Present Practice*

In so far as it can be ascertained, present practice recognizes all four of these objectives. However, it is not possible to discern the extent to which each governs.

The provision of settlement opportunities on family-size farms remains a basic tenet of federal irrigation policy in the seventeen western states. Reclamation law provides:[36]

> No right to the use of water for land in private ownership shall be sold for a tract exceeding 160 acres to any one landowner. . . .

This has been interpreted to mean that in community property states, a husband and wife may irrigate a maximum of 320 acres with water supplied by a federal project. And a provision in the recently-enacted Small Reclamation Projects Act limits the interest subsidy to those beneficiaries who observe a similar acreage limitation.[37] However, the Hope-Aiken Act, which permits subsidy of the agricultural phases of "the conservation, development, utilization, and disposal of water,"[38] including irrigation, contains no reference to the acreage limitation, and, accordingly, it appears that such a provision does not apply. This means that the acreage limitation is

[36] Reclamation Act of 1902, 32 STAT. 389, 43 U.S.C. §431 (1952).

[37] 70 STAT. 1046, 43 U.S.C. §422e(c) (Supp. III, 1956). The State Supreme Court of California in Ivanhoe Irr. Dist. v. All Parties, 306 P.2d 824 (1957), declared the acreage limitation to be unconstitutional. However, until the matter is settled by the federal courts, the basic policy remains unchanged.

[38] Watershed Protection and Flood Prevention Act, 68 STAT. 666 (1954), 16 U.S.C. §1001 (Supp. III, 1956).

applicable to federal programs undertaken in accordance with the provisions of reclamation law, but not to programs developed under the Hope-Aiken Act.

Reports of the Bureau of Reclamation and statements by executive and congressional leaders cite the "stabilization of the agricultural economy" and the "development of the West" as important objectives of the irrigation program. Also, the Bureau has analyzed the economic impact of individual projects upon particular areas.[39] Finally, in evaluating irrigation projects, the Bureau has given considerable weight to "secondary benefits"—*i.e.,* the benefits to others than the water users—the net of which, economists generally agree, is largely of a local or regional, rather than a national, nature. Thus, in effect, the Bureau's project evaluations have given weight to the local and regional impact of recommended projects.

The Secretary of the Interior, Fred A. Seaton, and the Commissioner of Reclamation, Wilbur Dexheimer, cite the production of food and fiber as an important objective of the federal irrigation program. However, many of these statements appear to be in response to questioning of further investment in irrigation while crop surpluses plague the agricultural economy. For example, Secretary Seaton has stated that[40]

> Reclamation lands produce but a tiny percentage of the crops in surplus which are now depressing the prices the farmer receives for his toil and production.

He has stated further, however, that[41]

> . . . the time is rapidly approaching when we will be concerned with how rapidly we can bring water and fertility to new acreage that is now unproductive rather than with crop surpluses.

2. *Policy Recommended by Study Groups*

All five reports specifically support the acreage-limitation principle, and all agree that there should be more flexibility in the law to determine what constitutes a family-size farm. However, the Cooke Commission recommends that this flexibility should apply only to "adjustment downward."[42]

The Task Force fails to analyze the other possible objectives of the federal irrigation program. Of the remaining four reports, the Cooke Commission offers the most extensive analysis of these objectives. Its conclusions are summarized in the following quotations:[43]

> Special consideration should be given to rehabilitation of existing irrigation projects, both Federal and private, as well as to small new irrigation projects offering the possibility of stabilizing the agriculture of an area.

[39] See *e.g.,* M. E. MARTS, AN EXPERIMENT IN THE MEASUREMENT OF THE INDIRECT BENEFITS OF IRRIGATION (1950).

[40] Speech by Fred A. Seaton, Chicago, Ill., Oct. 18, 1956.

[41] Speech by Fred A. Seaton, Loveland, Colo., Aug. 11, 1956.

[42] 1 COOKE COMM'N REPORT 174. *Cf.* SURVEY COMM'N REPORT 20; 1 SECOND HOOVER COMM'N REPORT 54; 1 TASK FORCE REPORT 97-98; ADVISORY COMM. REPORT 34.

[43] 1 COOKE COMM'N REPORT 14, 164. Others have attached much less significance to irrigation as a means of meeting future demands for agricultural commodities than does the Cooke Commission. See, *e.g.,* 1 PRESIDENT'S MATERIALS POLICY COMM'N, RESOURCES FOR FREEDOM 45-50 (1952).

The weight to be given reclamation of land . . . in determining the relative priority of programs and order of construction of specific multiple-purpose projects should be based on regional as well as national considerations.

In general, this analysis has shown that reclamation of new land through irrigation, flood control, drainage, and clearing, and improvement in the use of existing farm lands, must move forward together if the future needs of the nation are to be met.

In brief, then, the Cooke Commission gives a measure of support to all three objectives. It is noteworthy, however, that it is the "priority of programs" and the "order of construction" which should be based on regional considerations. In view of the emphasis upon economic evaluation in the report,[44] this would appear to mean that projects should first meet minimum requirements of economic efficiency. The Survey Commission, too, observes that "the need for irrigation to increase future food supply is evident in the latest population data," and that "irrigation serves to stabilize agriculture against periods of drought and climatic vagaries."[45] And the Second Hoover Commission accepts regional development as a major objective of federal irrigation programs, stating:[46]

The justification for Federal interest in irrigation is not solely to provide land for farmers or to increase food supply. These new farm areas inevitably create villages and towns whose populations thrive from furnishing supplies to the farmer, marketing his crops, and from the industries which grow around these areas.

While recognizing the past importance of water resources development to regional growth, however, it is significant that the Advisory Committee recommends that water resources development projects should be justified largely on the basis of primary benefits.[47] In other words, contrary to present practice, it would require irrigation projects to meet the objective of economic efficiency from the national point of view.

B. Federal Responsibility for Irrigation

1. *Present Practice*

The federal government has assumed a large measure of responsibility for irrigation activities. Under the Reclamation Act of 1902, as amended, it builds and operates large-scale projects in the seventeen western states. Under the Small Reclamation Projects Act, technical assistance is provided and funds are loaned to irrigation districts in the seventeen western states for the construction of small projects. Under the Hope-Aiken Act, irrigation may be included as one of the purposes in a small watershed project. Also, under the Water Facilities Act,[48] loans are made to farmers for developing water supplies for irrigation and other purposes. Finally, the Corps of Engineers, in cooperation with the Department of Agriculture, is investigating irrigation potentialities in the Delaware, Potomac, and lower Mississippi Valley areas,

[44] 1 COOKE COMM'N REPORT 55-65.
[45] SURVEY COMM'N REPORT 161.
[46] 1 SECOND HOOVER COMM'N REPORT 44.
[47] ADVISORY COMM. REPORT 25.
[48] 50 STAT. 869 (1937), as amended, 68 STAT. 735 (1954), 16 U.S.C. §§590r-x (Supp. III, 1956).

and presumably, if conditions so warrant, reservoirs will be recommended for federal construction which make provision for storage to meet irrigation needs.

Although the federal role is extensive, states, local units, and individuals have undertaken a major share of the task of irrigating land. Thus, California is embarking upon an extensive state water resources development program. For many years, Montana too, has had a modest program for the construction of small irrigation projects. And Utah and several other states loan funds to finance irrigation development. Much of the new irrigation also continues to be initiated by private individuals and groups, particularly in areas where ground water supplies are available. During the past decade, for example, the enormous increase in irrigated acreage in the High Plains of Texas has been the result of individual rather than governmental action.

In brief, then, where surface water supplies are involved, the federal government plays a major role in irrigation development. On the other hand, developments based upon ground water sources continue to be undertaken by private individuals.

2. *Policy Recommended by Study Groups*

The five study groups make no effort to define the federal role in irrigation development, although all assume a large measure of federal responsibility.[49] It is noteworthy, however, that the five reports devote little attention to the role of the federal government in irrigation development outside of those seventeen western states where it has been a traditional federal responsibility.

C. Repayment of Irrigation Costs

1. *Present Practice*

Existing and recommended policies relating to repayment of federal expenditures for irrigation works are exceedingly complex. Under reclamation law, water users are expected to repay the construction cost, without interest, within a period of forty years.[50] In actual practice, however, longer repayment periods have been allowed by Congress for a number of projects.[51] Also, for many years power revenues have been utilized to help repay the construction cost of irrigation facilities. Two different procedures have been used—namely:

1. Revenues from power projects received after the full amount of the capital costs of the power facilities are repaid are applied to the repayment of irrigation construction costs. This procedure is favored by the Eisenhower Administration and is the one to be used for the Colorado River Storage Project.
2. Under a ruling of the Solicitor of the Department of the Interior, the interest

[49] The Advisory Committee would encourage nonfederal development by making and guaranteeing loans to state and local bodies and by increasing the amount of the federal subsidy by ten per cent above what it would be under federal development. See p. 478 *supra*, for discussion of this point in relation to flood control.

[50] Omnibus Adjustment Act of 1926, 44 STAT. 649, 43 U.S.C. §423e (1952).

[51] See 3 COOKE COMM'N REPORT 208, citing thirteen projects having repayment periods in excess of 40 years.

component of the amount repaid from power revenues was applied to the repayment of irrigation construction costs. This practice was changed by the Eisenhower Administration, so that very few projects will benefit from it, although it was used in the justification of such programs as the Missouri Basin Project.

For irrigation costs incurred under the Hope-Aiken Act, local organizations are required to repay an amount ". . . which is equal to the ratio of direct identifiable benefits to total benefits produced by such works of improvement. . . ." However, the Department of Agriculture's policy also provides that ". . . in no event will the federal share of the cost exceed the equivalent federal assistance available for other project-type programs."[52] It will not be clear as to how much of a federal subsidy is involved in these practices, however, until there has been more experience under the Hope-Aiken Act. Under one interpretation of the above quotation, the maximum amount of the subsidy would be the same as the subsidy allowed under projects of the Bureau of Reclamation.

The Small Reclamation Projects Act provides for fifty-year, interest-free loans to finance irrigation development, to the extent the 160-acre limitation is observed.[53] Loans made under the provisions of the Water Facilities Act, however, must be repaid with interest.

In all cases, the costs of operation and maintenance are borne entirely by the local interests.

2. *Policy Recommended by Study Groups*

The reclamation repayment policies recommended are equally complex. The differing views are as follows:

1. The Cooke Commission[54] and the Advisory Committee[55] would permit delivery of water to farms exceeding the acreage limitation, provided that the water user pays all costs, including an appropriate share of interest on the irrigation investment. The other study groups are silent on this point.
2. The Cooke Commission[56] and the Survey Commission[57] emphasize that the primary beneficiaries should repay in accordance with their ability; the Advisory Committee proposes that the ". . . costs to be borne by the beneficiaries should be proportionate to the benefits received";[58] and the Task Force recommends that the identifiable beneficiaries ". . . bind themseleves to pay at least 50 per cent of the cost prorated to them . . . with interest."[59]
3. By one means or another, all five of the study groups would require the indirect beneficiaries to repay a portion of the project costs.[60]

[52] SECRETARY OF AGRICULTURE, *op. cit. supra* note 29.
[53] 70 STAT. 1046, 43 U.S.C. §422e(c) (Supp. III, 1956).
[54] 1 COOKE COMM'N REPORT 174.
[55] ADVISORY COMM. REPORT 34.
[56] 1 COOKE COMM'N REPORT 84.
[57] SURVEY COMM'N REPORT 16.
[58] ADVISORY COMM. REPORT 30.
[59] 1 TASK FORCE REPORT 98.
[60] See 1 COOKE COMM'N REPORT 84; SURVEY COMM'N REPORT 16; 1 SECOND HOOVER COMM'N REPORT 52; 1 TASK FORCE REPORT 98; ADVISORY COMM. REPORT 30.

4. The Cooke Commission,[61] the Second Hoover Commission,[62] and the Task Force[63] recommend specifically that the cost of operation and maintenance be borne by the beneficiaries. The Advisory Committee proposes that "responsibility for bearing the cost of maintenance and operation . . . should be turned over to non-Federal interests as soon as it is soundly feasible. . . ."[64]
5. Only the Advisory Committee and the Task Force refer to the use of power revenues to finance irrigation facilities. The Advisory Committee approves their use "...provided the project to which such benefits are applied is part of the area from which such revenues are derived."[65] The Task Force unequivocally opposes the practice.[66]

The most significant point in these recommendations is that all study groups agree that there should be a substantial federal subsidy of irrigation development, even though the precise formula for determining repayment varies among the reports. Nevertheless, they indicate that nonfederal interests should pay a major share of the costs.

D. Irrigation Policy Issues

This analysis suggests that a fundamental irrigation policy issue concerns the relative importance of economic efficiency and of noneconomic considerations in justifying irrigation programs. Most observers agree that the irrigation features of relatively few western water projects meet the conditions of national economic efficiency. Social objectives were of paramount importance in the initiation of the federal reclamation program and apparently retain a considerable, though hard to measure, importance in the public mind. However, noneconomic considerations cannot be numerically defined and equated with costs.

One solution to this problem is that apparently intended by the Cooke Commission and the Advisory Committee—namely, to require that all projects, as a minimum, meet the requirement of national economic efficiency. As a practical matter, this means that a benefit-cost ratio of unity or better without secondary benefits would be necessary.[67] In view of the small proportion of projects which can meet this requirement and the continued political support for western irrigation development, such a proposal would appear to have little chance of adoption. Another possibility would be to relate the noneconomic considerations to the cost of the project above the amount justified on the basis of national economic efficiency alone. This would provide the President and the Congress with a better opportunity than at present for making a value judgment as to whether noneconomic considerations justify their costs. Such an explicit identification of the noneconomic nature of most

[61] COOKE COMM'N REPORT 84.
[62] 1 SECOND HOOVER COMM'N REPORT 52.
[63] 1 TASK FORCE REPORT 99.
[64] ADVISORY COMM. REPORT 30.
[65] *Id.* at 33.
[66] 1 TASK FORCE REPORT 57.
[67] The position of the Cooke Commission is not entirely clear on this point. For example, it states that ". . . many projects will have their major effect on the broad development of our social economy. It will, therefore, be contrary to the public interest to place principal reliance in project analysis on primary benefits, which may often be private in character." 1 COOKE COMM'N REPORT 56.

western irrigation projects might, however, be as restrictive as the requirement that they have a benefit-cost ratio of unity or better without secondary benefits.

A second major issue relates to the future federal role in irrigation development. Irrigation is a traditional activity of the federal government. However, this tradition is limited to the arid and semiarid lands of the seventeen western states, where the major objectives have been to provide settlement opportunities, to develop the West, and to stabilize a drought-plagued agriculture. The really pertinent question is that of the federal role in the thirty-one eastern states, where land ownership patterns, climatic conditions, and economic factors are quite different than in the West. As the Corps of Engineers and the Department of Agriculture proceed with their programs to develop water resources in the thirty-one eastern states, it is hard to see how they can avoid consideration of irrigation water demands; such demands must be taken into account if the best development of the nation's water resources is to be realized. Accordingly, it appears that where irrigation can be practiced economically and surface sources of supply are needed, the federal government will assume a major role in the development of irrigation. If this should happen, what are to be the objectives of the federal program? Should the noneconomic objectives associated with western irrigation, which have offered most of the rationale for western subsidies, be applicable to the developed, humid East? This question assumes its most specific form as it applies to the acreage limitation. If the acreage limitation is not applied in the East, can it continue to be applied in the West?

A third issue is that of repayment of federal irrigation costs. The history of irrigation repayment policies under reclamation law has been characterized by a progressive increase in the federal subsidy. This has been done by using power revenues and by extending the repayment period from ten years under the Reclamation Act of 1902 to the present practice of forty years or more. As in the case of flood management, this trend poses the question of the extent to which it is equitable for the general taxpayer to subsidize the irrigation water user. Nevertheless, the situation is not entirely comparable with flood control, because the irrigator is, in general, required to pay a larger part of the cost than the flood-control beneficiary.

Another facet of the issue involves the question of consistency of repayment policy among agencies. It has been noted that irrigation developed under the Hope-Aiken Act may involve a federal subsidy, but the amount of the subsidy is not determinable, although it could be as great as the subsidy permitted under western reclamation law. Whatever the subsidy may be, the irrigator under reclamation law would be required to observe the acreage limitation in order to benefit from the subsidy, whereas the irrigator under the Hope-Aiken Act would not. Also, what repayment provisions will govern in the case of irrigation storage provided in Corps of Engineers reservoirs constructed in the thirty-one eastern states? No policies have been enunciated. What will be the extent of the federal subsidy, if any, and will the acreage limitation be a condition which one must meet to benefit from the subsidy? It appears that these questions will confront federal policy-makers in the near future.

IV

HYDROELECTRIC POWER[68]

The federal government has been actively engaged in the production and marketing of electric power, as an integral part of water resources development, since the early days of the federal reclamation program.[69] As of December 31, 1955, the installed capacity of federal generating facilities totalled 16,962,000 kilowatts out of a total installed capacity for the nation, both public and private, of 114,371,000 kilowatts.[70] Federal production and marketing of power continues to be the most controversial water resources policy issue.

A. Objectives of Power Activities

A review of the present practice and the study group reports reveals six objectives associated with federal power development and marketing. These are as follows:

1. To maximize the economic returns to the nation from the development of its water resources.
2. To supply an important part of the nation's future power needs.
3. To service federally-owned power-consuming installations.
4. To help finance the development of irrigation.
5. To promote the widespread use of electricity so that as many people as possible may enjoy the benefits of electric energy.
6. To provide a "yardstick" for gauging the efficiency of privately-owned utilities and as a competitive force for stimulating improved public service.

In the analysis which follows, existing practice and recommended policies are compared as they relate to these objectives.

1. *Present Practice*

It is difficult to determine from any analysis of current practices the extent to which each of the foregoing objectives governs federal power activities. First, there is no clear policy statement that the attainment of economic efficiency in the development of water resources is a major objective of the federal power program. However, this appears to be implicit in existing procedures for economic evaluation of power projects in which benefits are, in general, based upon estimates of alternative costs for providing equivalent power. Secondly, the federal government has not indicated what part of the nation's future power needs should be supplied from hydroelectric sources, although Secretary Seaton has stated that during the next

[68] The author is particularly indebted to Henry P. Caulfield, Jr., of Resources for the Future, Inc., for assistance in the preparation of this section. Mr. Caulfield is engaged in a comprehensive study of federal electric power policy.

[69] The first federal power project was Roosevelt Dam on the Salt River in Arizona, placed in service in 1910.

[70] See EDISON ELECTRIC INSTITUTE, ELECTRIC UTILITY INDUSTRY IN THE UNITED STATES, STATISTICAL BULLETIN FOR THE YEAR 1955, Table 2, at 6 (Pub. No. 56-2 1956).

twenty years ". . . only 8½ percent of the needed new generating capacity can possibly come from hydroelectric plants."[71]

On the other hand, federal practice has long recognized that one objective of federal power development is to service federal installations. For example, a large part of the power output of the TVA is for federal atomic energy installations. The use of power revenues to finance irrigation development is also an established policy of the federal government and continues to be recognized in such legislation as the Colorado River Storage Project Act.[72] And the objective of promoting the widespread use of electric power is stated in numerous statutes and administrative orders.

This last objective has been associated with provisions in law for preferential treatment in the sale of power to public bodies. Numerous statutes, including flood control law,[73] general reclamation law,[74], the Tennessee Valley Authority Act,[75] the Bonneville Project Act,[76], the Fort Peck Project Act,[77] and the Falcon Dam Act,[78] require that in the sale of power from federal dams, preference shall be given to public bodies and cooperatives. The TVA Act, the Fort Peck Act, and the Falcon Dam Act, in fact, assert that it is the policy of the federal government to encourage the widest possible use of electric power.[79] Thus, too, the power policy of the Department of the Interior, as issued in August 1953, states that[80]

> . . . the Department will give preference and priority to public bodies and co-operatives in disposing of electric energy generated at Federal plants. It will be the policy of the Department to dispose of power, remaining after provision for existing preference customers, to privately owned public utilities serving domestic and rural customers in the area.

It must be recognized, however, that the "partnership policy" of the Eisenhower Administration tends, in some degree, to offset the effect of the preference clause. To the extent that hydroelectric power is developed and distributed by private interests, the Government is unable to extend the benefits accorded by the preference clause to public bodies and cooperatives.

It is impossible to determine the extent to which the "yardstick" principle is applicable to present practice. The "partnership policy" does not seem compatible with the view that federal power development should be used as a device for regulating and stimulating the power industry. To the extent that the Administration's

[71] Speech by Fred A. Seaton, Chicago, Ill., Oct. 18, 1956.
[72] 70 STAT. 105, 43 U.S.C. §620 (Supp. III, 1956).
[73] Flood Control Act of 1944, 58 STAT. 890, as amended, 16 U.S.C. §825s (Supp. III, 1956).
[74] Reclamation Project Act of 1939, 53 STAT. 1193, as amended, 43 U.S.C. §485h(c) (1952).
[75] 48 STAT. 64 (1933), as amended, 16 U.S.C. §831i (1952).
[76] 50 STAT. 733 (1937), as amended, 16 U.S.C. §832c (1952).
[77] 52 STAT. 405 (1938), 16 U.S.C. §833c (1952).
[78] 68 STAT. 255 (1954).
[79] Wide use of power is a major objective of the Rural Electrification Administration, which lends federal funds to local bodies for the production and marketing of power for rural areas. Also, the cooperatives which receive most of these loans are entitled to preference in the sale of federally-produced power.
[80] Statement of Power Policy issued Aug. 18, 1953 and signed by Undersecretary of the Interior Ralph Tudor.

partnership policy succeeds in transferring the task of developing power facilities at federal projects to private enterprise, therefore, the federal government may not be able to apply the "yardstick" principle. However, the federal government is continuing to operate existing facilities, and additional facilities are being built by the federal government. Thus, as a practical matter, the federal government continues to be an important factor in the power industry.

2. Policy Recommended by Study Groups

Specific statements in the reports of the Cooke Commission,[81] the Survey Commission,[82] and the Second Hoover Commission[83] support the view that power development is necessary to realize the maximum benefit from the nation's water resources. On the other hand, the Task Force states "that the mere presence of potential water power in connection with a Federal project does not constitute a mandate for its development."[84] The Advisory Committee does not comment on this question.

The Cooke Commission[85] and the Survey Commission[86] envisage federally-developed hydroelectric power as contributing an important part of the nation's future power needs, whereas the other three study groups do not discuss this point.

The reports appear to accept as appropriate federal production of power to supply federal needs. For example, the Task Force suggests that the Atomic Energy Commission assume responsibility for the power facilities of the TVA used to supply atomic energy installations.[87] Also, the Survey Commission states that "disposition of power to preference customers should be subject only to the prior requirements of the government itself for direct use. . . ."[88]

As discussed in the section on irrigation, the Advisory Committee approves the use of power revenues to finance irrigation development, the Task Force objects to the practice, and the other three reports are silent on this point.[89]

The Cooke Commission[90] and the Survey Commission[91] support the "preference clause" and the objective of encouraging widespread use of electric energy. The Second Hoover Commission and the Task Force, however, support a repeal of the "preference clause" because ". . . in equity the private utilities and their customers should be able to secure a fair share of the Government power on equal terms with preference organizations."[92] In lieu of the "preference clause," the Task Force suggests a provision that ". . . no purchaser of Federally generated power shall receive more than a fair return from the resale thereof. . . ."[93] The Advisory Committee does not discuss this objective.

In considering the impact of federal development on the power industry, the

[81] 1 COOKE COMM'N REPORT 227.
[82] SURVEY COMM'N REPORT 154-55.
[83] 1 SECOND HOOVER COMM'N REPORT 118.
[84] 1 TASK FORCE REPORT 57.
[85] 1 COOKE COMM'N REPORT 240.
[86] SURVEY COMM'N REPORT 138.
[87] 1 TASK FORCE REPORT 76.
[88] SURVEY COMM'N REPORT 156.
[89] See notes 65 and 66 *supra* and text cited thereto.
[90] 1 COOKE COMM'N REPORT 245.
[91] SURVEY COMM'N REPORT 19.
[92] 1 SECOND HOOVER COMM'N REPORT 112-13.
[93] 1 TASK FORCE REPORT 97.

Cooke Commission refers to the ". . . mixed system of public and private operation . . ." of the power industry as ". . . the system which has given force to regulation of private power corporations. . . ."[94] The report also states that this system ". . . offers the possibility of actual or potential competition to stimulate what would otherwise be publicly sanctioned monopolies. . . ."[95] Neither the Survey Commission nor the Advisory Committee discuss this issue. Both the Second Hoover Commission and the Task Force, however, object to the Cooke Commission view. The Second Hoover Commission indicates that federal power development as a regulatory force is unnecessary because "the regulation of electric utilities . . . by both state and Federal governments has become effective";[96] and the Task Force asserts that federal power is not an appropriate "yardstick" since ". . . Federal power, because of low-interest financing, and failure to include taxes, has been sold at rates below those that private utility companies could meet."[97]

B. Federal Responsibility for Power Activities

There are four major policy issues relating to federal responsibility for power production and marketing—namely:

1. Should the federal government construct and operate hydroelectric generating facilities?
2. Should the federal government construct and operate transmission facilities?
3. Should the federal government construct fuel-generating facilities for operation in conjunction with federally-owned hydroelectric facilities?
4. Should the federal government assume responsibility for producing sufficient power to meet the requirements of an area or a region?

1. *Present Practice*

Under the Federal Power Act, the Federal Power Commission is expected to advise the Congress whenever it ". . . shall find that any government dam may be advantageously used by the United States for public purposes in addition to navigation. . . ."[98] Thus, this act assumes the existence of a federal role in hydroelectric power development. The power policy statement of the Department of the Interior, moreover, includes the following:[99]

> The Department will particularly emphasize those multi-purpose projects with hydroelectric developments which, because of size or complexity, are beyond the means of local, public or private enterprise.

Presumably, the Colorado River Storage Project falls in this category. Actions by the Adminstration in opposing federal development of the Hells Canyon site and in support of "partnership" projects, however, indicate a policy of reducing federal

[94] 1 COOKE COMM'N REPORT 228.
[95] *Ibid.*
[96] 1 SECOND HOOVER COMM'N REPORT 120.
[97] 1 TASK FORCE REPORT 13-14.
[98] 41 STAT. 1065 (1920), as amended, 49 STAT. 839 (1935), 16 U.S.C. §797(e) (1952). See also 41 STAT. 1067 (1920), as amended, 49 STAT. 842 (1935), 16 U.S.C. §800(b) (1952).
[99] Statement of Power Policy, *supra* note 80.

participation in hydroelectric power development. Again, the question arises as to what is actual practice? In the past, the federal government has undertaken projects which might have been undertaken by private power interests. But deauthorization of the Alabama-Coose Project by the Congress, in order to permit private development,[100] failure of Congress to authorize Hell's Canyon, and the lack of new federal starts in the hydroelectric-power-rich Northwest suggests a change from past policy.

Federal law authorizes the construction of transmission facilities,[101] Congress continues to appropriate money for this purpose, and federal agencies continue to build and operate them. The power policy statement of the Department of the Interior, too, provides that the Department will build needed transmission lines, but that the facilities of other public or private agencies will be utilized when service is made available upon "reasonable terms." The definition of "reasonable terms" is as follows:[102]

> These terms shall generally be such that the Federally produced power will be made available to customers at costs no higher than would result from the construction of transmission facilities by the Federal Government.

On the fuel-generation issue, existing practice varies between the Tennessee Valley and the rest of the nation. Federally-owned fuel-generating facilities are significant only in the Tennessee Valley. Administration efforts to provide additional facilities in that area through the Dixon-Yates contract indicate that it does not favor federal construction of steam-generating facilities. Nevertheless, the Administration is now supporting legislation to permit the TVA to float revenue bonds to finance the construction of such facilities.[103] Congress, however, has been cool toward federal construction of fuel-generating plants.

Closely associated with the foregoing issue is the question of federal responsibility as a utility for supplying the power of an area. This issue is particularly pertinent to the situation in the Tennessee Valley and the Pacific Northwest. The policy of the Administration, as expressed in the power policy statement of the Department of the Interior, provides that:[104]

> It is recognized that the primary responsibility for supplying power needs of an area rests with the people locally. . . . The Department does not assume that it has the exclusive right or responsibility for the construction of dams or the generation, transmission and sales of electric energy in any area, basin, or region.

Administration support of "partnership" projects in the Northwest further appears to be in accord with the view that the federal government should not assume a

[100] 68 STAT. 302 (1954).

[101] See, *e.g.*, Flood Control Act of 1944, 58 STAT. 890, as amended, 16 U.S.C. §825s (1952); Tennessee Valley Authority Act, 48 STAT. 65 (1933), 16 U.S.C. §831k (1952).

[102] Statement of Power Policy, *supra* note 80.

[103] See U. S. BUREAU OF THE BUDGET, THE BUDGET OF THE U. S. GOVERNMENT FOR THE FISCAL YEAR ENDING JUNE 30, 1958, at M-54 (1957).

[104] Statement of Power Policy, *supra* note 80.

responsibility for meeting the power needs of that area. On the other hand, its support of issuance of revenue bonds by the TVA to finance power development to meet future needs in the Valley suggests a belief that the federal government must continue to assume a utility responsibility in that area.

2. *Policy Recommended by Study Groups*

The Advisory Committee does not examine federal responsibility for hydroelectric power activities, but the other four reports devote considerable attention to this issue. The Cooke Commission and the Survey Commission recognize that the federal government has a major responsibility for the development of hydroelectric power resources. The Cooke Commission is most explicit on this point, observing that,[105]

> Full development of the Nation's undeveloped water power resources, as an integral part of comprehensive basin programs, should be considered a major Federal responsibility, to be exercised in such a way as to assure ample supplies of hydroelectric energy well in advance of expanding regional and national needs.

Both commissions, however, would permit the licensing of nonfederal interests under conditions which they believe would assure protection of the public interest. For example, the Survey Commission states that[106]

> Non-federal interests, both public and private, should be licensed to develop water power sites when, in the opinion of the agency responsible for the unified river plan, their proposals are harmonious with multi-purpose development, management, and use of the river and the power is marketed in the public interest.

The Second Hoover Commission, taking a different tack, proposes ". . . that private enterprise be offered the opportunity to provide the capital for the electrical component of multiple-purpose dams and dispose of the power through their own systems. . . ."[107] The Task Force report, too, includes a series of far-reaching recommendations which would minimize federal activity in the power field. First, it proposes that the federal government ". . . invite and be receptive to proposals from non-federal interests, public or private, to purchase or lease all Federal electric power facilities not needed for the conduct of Government business. . . ." Secondly, it recommends that when power development is undertaken, ". . . generating facilities be built by others than the Federal Government. . . ." And finally, it states "that, where it is now or may in the future become unavoidable in terms of fair returns that the Federal Government construct electric generating facilities, . . . the facilities be leased to a non-Federal entity . . ."; and where this is impracticable ". . . the power be disposed of at the generating station or at the nearest practicable point thereto."[108]

Views on federal responsibility for construction of transmission lines parallel views on federal responsibility for construction and operation of generating facilities. Both the Cooke Commission and the Survey Commission consider that federal agencies

[105] 1 COOKE COMM'N REPORT 16.
[106] SURVEY COMM'N REPORT 19.
[107] 1 SECOND HOOVER COMM'N REPORT 122.
[108] 1 TASK FORCE REPORT 95-96.

should have authority to build transmission lines. However, both agree that private power facilities should be utilized where it is advantageous to do so. The Cooke Commission states the problem as follows:[109]

> . . . Federal arrangements for marketing power should where possible take full advantage of private power facilities, provided the contracts preserve the preferential rights of public bodies and cooperatives to a share of the power, or its equivalent, at the lowest possible rates.

Both the Second Hoover Commission[110] and the Task Force,[111] however, unequivocally oppose federal construction of transmission lines.

Similarly, on the fuel-generation issue, the Cooke Commission[112] and the Survey Commission[113] would permit federal construction and operation of such facilities, and the Second Hoover Comission[114] and the Task Force[115] oppose such action.

The Survey Commission, the Second Hoover Commission, and the Advisory Committee fail to discuss federal responsibility for meeting the power needs of an area. The Cooke Commission, however, states that[116]

> Where the Federal government assumes a major responsibility for the power supply to distribution systems, this should be recognized as a utility responsibility, requiring the construction of new generating capacity, whether hydroelectric or steam electric, well in advance of expanding needs.

But the Task Force directly opposes this view stating that federal agencies should not ". . . make contracts for the sale of Federal power which have, or might have, the effect of causing the agency to undertake a public utility obligation to any area or region. . . ."[117]

C. Repayment of Power Costs

There is full agreement among the five reports that the federal investment in power facilities should be repaid with interest. Present practice conforms, in general, with this policy. The power policy statement of the Department of the Interior provides that[118]

> Rate schedules will be prepared on a basis which will provide for the cost of producing and transmitting the energy and will return the capital investment in generation and transmission facilities together with interest in not more than 50 years.

With a few exceptions, federal power facilities appear to meet these general requirements, although there is considerable dispute as to what costs should be allocated to power and what interest rates should apply. On the other hand, a major disagreement centers on the question of payments in lieu of taxes, which is discussed in the paragraphs which immediately follow.

[109] 1 COOKE COMM'N REPORT 16. *Cf.* SURVEY COMM'N REPORT 19.
[110] 1 SECOND HOOVER COMM'N REPORT 113.
[111] 1 TASK FORCE REPORT 96.
[112] 1 COOKE COMM'N REPORT 16.
[113] SURVEY COMM'N REPORT 19.
[114] 1 SECOND HOOVER COMM'N REPORT 112.
[115] 1 TASK FORCE REPORT 96.
[116] 1 COOKE COMM'N REPORT 16.
[117] 1 TASK FORCE REPORT 96.
[118] Statement of Power Policy, *supra* note 80.

1. *Present Practice*

With the exception of the Tennessee Valley Authority, federal water resources agencies do not, as a general rule, make payments in lieu of taxes. The TVA pays in lieu of taxes to states in its service area an amount equal to five per cent of its revenues from all sales of power, excepting sales to agencies of the federal government.[119]

2. *Policy Recommended by Study Groups*

All five reports agree that payments in lieu of taxes are appropriate. Differences focus upon the principles which should determine the amount of such payments to state and local agencies, and whether payments in lieu of federal taxes are warranted. The Cooke Commission recommends that payments to state and local governments ". . . should not exceed those [taxes] previously paid for properties taken over."[120] The Survey Commission suggests that ". . . Federal contributions should take into consideration the extent of actual loss, the effect of Federal ownership on the services of state and local governments, and the local benefits from Federal ownership."[121] Neither report recommends payments in lieu of federal taxes. On the other hand, the majority of the Second Hoover Commission[122] and its Task Force[123] advocate payments in lieu of taxes which would equal the amount that would be paid by a nongovernmental producer as taxes to local, state, and federal governments. The Advisory Committee suggests that[124]

> . . . revenue producing water resources projects should be considered in the same category as other Government business enterprises and that when general legislation is enacted, requiring such Federal activities to make payments in lieu of taxes, water resources projects be included on the same basis as other similar enterprises.

D. Power Policy Issues

It is in this field that the differences among the study groups are the most sharply defined. It is this aspect of water resources policy which has been subject to the most heated political debate. The argument has centered on the question of whether it is appropriate for the federal government to participate actively in the development of the nation's hydroelectric power resources. Power policy issues are concerned with three basic questions—namely:

1. Is it appropriate for the federal government to utilize its position in the development of water resources to promote the widespread use of electricity?
2. To what extent should public development of power be used as a means of regulating and stimulating the power industry to provide good service?
3. How can the water and power resources of the nation be developed to maximize the economic returns to the nation?

The first issue involves the question of whether it is socially desirable for the

[119] See TVA ANN. REP. 39 (1955).
[120] 1 COOKE COMM'N REPORT 84.
[121] SURVEY COMM'N REPORT 16.
[122] 1 SECOND HOOVER COMM'N REPORT 111.
[123] 1 TASK FORCE REPORT 106.
[124] ADVISORY COMM. REPORT 34.

federal government to promote the widespread use of electric energy and whether the preference clause is the best means for attaining such an objective. On this point, the study groups differ sharply, the Cooke Commission and the Survey Commission supporting the preference clause, and the Second Hoover Commission and the Task Force opposing it.

The second issue involves the question of whether state and federal regulatory machinery constitutes an adequate method of assuring operation of the public power industry in conformity with the public interest. The Cooke Commission views the mixture of public and private power as ". . . the system which has given force to regulation of private power corporations. . . ."[125] On the other hand, the Second Hoover Commission and the Task Force believe that regulation insures protection of the public interest. A study which seeks to establish the effect federal power development and marketing has had upon promoting the use of electricity and to estimate its impact upon the functioning of the power industry might help illuminate issues which are charged with much emotion.

In considering the third issue, the question of economic efficiency, one must begin with the physical and economic characteristics of hydroelectric power. Such power may be produced through "run-of-river" power plants, without impoundments; or it may be produced through reservoirs which concentrate the fall or "head" at one location, even out the supply of water for plant production through periods of low stream flow, and permit the retention of the energy potential in stored water when power is not needed. In general, initial investment costs for hydroelectric power are high compared with the investment costs for fuel-generating facilities, whereas operating and maintenance costs are lower. A major advantage of hydroelectric power based on reservoirs is that power can be turned off and on almost instantaneously without energy loss, whereas fuel-generating facilities require a fairly extensive period for heating of boilers. This makes hydroelectric power particularly valuable for stand-by purposes to meet emergency situations and to handle peak loads in energy demand.

The costs of potential hydroelectric power in a given stream can be minimized (a) by including power as one purpose in a multiple-purpose reservoir, and (b) by designing a system of reservoirs in a river basin to operate in coordination with one another in such a manner as to maximize the amount of power which can be produced from a given stream. It should be emphasized that the other purposes of a multiple-purpose system involve nonmarketable benefits, such as flood control, recreation opportunities, etc. Also, it is significant that important power benefits from a given reservoir may stem from the production of power at another downstream power site.

In short, economic efficiency dictates that (a) except where falling water is the primary source of energy, it should be so integrated with fuel-generating facilities as to serve the requirements of emergency and peak-load demands; (b) hydroelectric

[125] I COOKE COMM'N REPORT 228.

power be produced through multiple-purpose projects; and (c) projects be designed for coordinated operation in a system which will maximize use of available water supplies in power production, subject to limitations imposed by other purposes.[126] The TVA system probably comes closer than any other to meeting these requirements at the present time. However, the TVA approach involves large-scale federal investment in fuel-generating facilities, and it is doubtful whether such extensive federal investment can be expected in other areas. One alternative might be the "partnership" concept. A second alternative is the "giant power" concept advocated by Leland Olds, former Chairman of the Federal Power Commission.[127] Other alternatives may warrant consideration.

In seeking a resolution of the power controversy, the policy-maker is confronted with the task of reconciling economic and noneconomic objectives. His task is one of securing acceptance of an institutional arrangement whereby the economies of system operation of multiple-purpose projects having nonmarketable benefits can be integrated with fuel-generating facilities, while attaining the social objectives which a democratic society decides should be a product of federal water resources development.

V

MUNICIPAL AND INDUSTRIAL WATER SUPPLY

As water use for all purposes increases, it is often found that municipal and industrial needs can be fulfilled most economically through multiple-purpose storage reservoirs. Since the federal government has assumed a major role in the construction of such reservoirs, the demand is growing for federal consideration of municipal and industrial water supply needs in making river basin plans. It is widely accepted that municipal and industrial water use will grow rapidly in the years ahead. Three of the study group reports,[128] projections of needs by federal agencies, and other estimates confirm this conclusion. The prospective growth in demand and the attention being given these needs by federal agencies indicate that national water resources policy must take into account this phase of water resources development.

A. Objective of Municipal and Industrial Water Supply Development

For the most part, there has been little debate about the objectives of municipal and industrial water supply development; the generally-accepted goal is the provision of supplies to meet immediate and future needs of cities and industries. Nevertheless, one finds occasional reference to the development of such supplies in advance of demand as a means of stimulating industrial growth in a particular area. This was, of course, an important consideration in the development of supplies for

[126] The foregoing statement is based upon JOHN V. KRUTILLA AND OTTO ECKSTEIN, MULTIPLE PURPOSE RIVER DEVELOPMENT: STUDIES IN APPLIED ECONOMIC ANALYSIS (to be published).

[127] See testimony of Leland Olds in *Hearings before a Subcommittee of the Committee on Interstate and Foreign Commerce of the Senate on S. 2643*, 84th Cong., 2d Sess. 317-47 (1956).

[128] 1 COOKE COMM'N REPORT 184, SECOND HOOVER COMM'N REPORT 5, and the ADVISORY COMM. REPORT 5.

Los Angeles. However, until recently this has not been an issue of federal water resources policy.

The issues considered herein are as follows:

1. What part should the federal government play in estimating needs, preparing plans and constructing facilities to meet those needs?
2. To what extent should the federal government bear costs allocated to municipal and industrial water supply?

B. Federal Responsibility for Municipal and Industrial Water Supply Development

1. *Present Practice*

Existing federal policy on this issue is in a state of flux. Basic reclamation law[129] and flood control legislation[130] permit the inclusion of municipal and industrial water supply storage in federal reservoirs, provided that such an arrangement does not interfere with the other recognized federal purposes of the projects, such as flood control, navigation, and irrigation. However, the present trend is away from these limitations. The Hope-Aiken Act permits inclusion of municipal and industrial water supply storage in projects constructed under that act without such a limitation. The act authorizing the Colorado River Storage Project makes specific exception to the limitations imposed by reclamation law.[131] And the vetoed Omnibus Flood Control and Rivers and Harbors Act of 1956 sought to define policy applicable to municipal and industrial water supply storage in reservoirs constructed by the Corps of Engineers so as to lift the limitation in flood-control law.[132]

In general, it has been the policy of the federal agencies to expect local interests to estimate demands for these purposes. Then, upon request, the federal agencies would provide the storage in multiple-purpose federal reservoirs. In recent years, however, both the Corps of Engineers and the Bureau of Reclamation have taken a growing interest in this phase of water resources development. On the Canadian River, in Texas, the Bureau of Reclamation projected demands and designed a reservoir and distribution system to serve a number of towns in the Panhandle area. At the present time, the Bureau is engaged in a large-scale planning program for the Gulf Coast area of Texas, where municipal and industrial water constitutes a major purpose of the system. In a number of other areas, too, the Bureau is estimating needs and formulating plans which recognize municipal and industrial water supply development as a principal objective of its work. At the same time, in most areas in the seventeen western states, the Bureau treats this activity as incidental to irrigation development. The situation in the Corps of Engineers is somewhat similar. In the Delaware River basin, the Corps is sponsoring studies of future demand for

[129] 41 STAT. 451 (1920) 43 U.S.C. §521 (1952).

[130] Flood Control Act of 1936, as amended, 50 STAT. 515 (1937), 61 STAT. 501 (1947), 33 U.S.C. §701h (1952).

[131] Colorado River Storage Project Act, 70 STAT. 107, 43 U.S.C. §620c (Supp. III, 1956).

[132] H.R. 12080, 84th Cong., 2d Sess. §206 (1956). The new omnibus bill, as it passed the Senate, would lift the limitations applicable to both the Corps of Engineers and the Bureau of Reclamation. See S. 497, 85th Cong., 1st Sess. §206 (1957).

municipal and industrial water, in recognition that this purpose constitutes a primary objective of water resources development in the area. Yet, throughout most of the country, it does not undertake such studies, and municipal and industrial water supply is treated as incidental to flood control, navigation, and other accepted federal functions.

Available information from the Department of Agriculture indicates that storage for these purposes is included in upstream reservoirs only when specifically requested by local interests and on the basis of the requirements as estimated by the local users.

2. *Policy Recommended by Study Groups*

The Cooke Commission,[133] the Second Hoover Commission,[134] and the Task Force[135] state specifically that the provision of municipal and industrial water supply should be a local responsibility. This also appears to be the view of the other two groups.[136] Nevertheless, all five reports recognize that the federal government cannot avoid some involvement in municipal and industrial water supply development. Thus, the Cooke Commission points out that "the growing needs of communities for water supply should . . . be considered in connection with the planning of all comprehensive basin programs."[137] Even the Task Force, which in general takes the narrowest view of federal responsibilities, recognizes that the federal government may supply water for such purposes ". . . as an incident to multiple purpose projects in which the Federal government participates primarily for flood control, navigation or irrigation."[138]

C. Repayment of Municipal and Industrial Water Supply Development Costs

1. *Present Practice*

Existing law gives considerable latitude to the Secretary of the Army[139] and the Secretary of the Interior[140] in determining the amount of reimbursement for the cost of municipal and industrial water supply facilities built by the Corps of Engineers and the Bureau of Reclamation. But the Watershed Protection and Flood Prevention Act, as amended, provides for full reimbursement of municipal and industrial storage costs, including interest;[141] and it is the stated policy of the federal agencies to require full repayment of such costs. For example, Budget Bureau Circular A-47 provides that ". . . the total financial costs to be allocated to this purpose will be fully reimbursed by the States, local governments, districts, or persons served."[142] Discussions with agency officials confirm the view that this policy is generally applied in practice by the federal agencies. Yet, a change in this policy may be impending.

[133] 1 COOKE COMM'N REPORT 15.
[134] 1 SECOND HOOVER COMM'N REPORT 29.
[135] 1 TASK FORCE REPORT 224.
[136] See SURVEY COMM'N REPORT 16; ADVISORY COMM. REPORT 35.
[137] 1 COOKE COMM'N REPORT 15.
[138] 1 TASK FORCE REPORT 224.
[139] 50 STAT. 515 (1937), as amended, 61 STAT. 501 (1947), 33 U.S.C. §701h (1952).
[140] Reclamation Project Act of 1939, 53 STAT. 1193, as amended, 43 U.S.C. §485h(c) (1952).
[141] 68 STAT. 667 (1954), as amended, 70 STAT. 1088, 1090, 16 U.S.C. §§1004(2), 1006a (Supp. III, 1956).
[142] U. S. Bureau of the Budget, Circular A-47, dated Dec. 31, 1952.

First, there are instances where the federal government has provided "low-flow regulation" without cost to the beneficiaries. In some cases, the principal beneficiaries are the towns downstream from the regulating reservoirs, which have thereby a stable source of water supply available in the regulated stream flow. An example is Fall River Reservoir, on a tributary of the Verdigris River, in Kansas. This reservoir was authorized for flood control and low-flow regulation on a nonreimbursable basis. The actual purpose which the reservoir serves is illustrated by a statement in a recent report of the U. S. Geological Survey, as follows:[143]

> Fall River Reservoir *that supplies towns on Fall River* is expected to be empty by April unless there is substantial relief. (Italics supplied.)

The vetoed Omnibus Flood Control and Rivers and Harbors Bill of 1956 would also have authorized low-flow regulation on a nonreimbursable basis;[144] and General Itschner, the Chief of Engineers, has stated that he expects the 85th Congress to enact such legislation.[145] If the Fall River pattern should result, the federal government would, in effect, be providing municipal and industrial water on a nonreimbursable basis.

A second facet of this problem relates to the financing of municipal and industrial water supply costs before demand has materialized or local interests are in a position to bear such costs. The vetoed Omnibus Flood Control and Rivers and Harbors Bill of 1956 would have authorized a system of projects in Oklahoma and Arkansas justified, in large measure, on the basis of water supply benefits.[146] However, the demand for the water supply has not materialized. If these projects are authorized and built, would the interest on the construction investment which would accumulate while demand was developing be a charge against the eventual water users, or would this be a cost to the federal government? Also, if the demand never materializes, would the federal government bear the total cost?

2. *Policy Recommended by Study Groups*

The five study group reports do not analyze the aspects of reimbursement policy discussed above. However, with the exception of the Second Hoover Commission, which omits discussion of the issue, they agree that the full costs allocated to municipal and industrial water, including interest on the investment, should be borne by local public or private interests.[147]

[143] U. S. Geological Survey, Dep't of the Interior, Water Resources Review. Dec. 1956, p. 2.

[144] H.R. 12080, 84th Cong., 2d Sess. §205 (1956).

[145] Remarks by Major General Itschner, Chief of Engineers, U. S. Army, before the Arkansas Basin Development Association, at Sequoyah State Park, Oklahoma, Oct. 29, 1956. Such a provision is included in the new omnibus bill which has passed the Senate. See S. 497, 85th Cong., 1st Sess. §205 (1957).

[146] H.R. 12080, 84th Cong., 2d Sess. §203 (1956). These are the seven reservoirs above Millwood Reservoir on Little River referred to in this bill. S. 497, 85th Cong., 1st Sess. (1957) would also authorize these reservoirs.

[147] See 1 COOKE COMM'N REPORT 12-13; SURVEY COMM'N REPORT 16; 1 TASK FORCE REPORT 224; ADVISORY COMM. REPORT 31.

D. Municipal and Industrial Water Supply Policy Issues

The municipal and industrial water supply function casts in sharp relief the policy issues involved in dealing with those aspects of water resources development which traditionally are local, state, and private responsibilities. Economic efficiency in water resources development requires that municipal and industrial needs be taken into account in the design of river basin systems. Assuming this premise, should federal agencies estimate future requirements, or should construction plans be based upon the estimates of local public and private interests? If the latter course is strictly followed, it must be recognized that occasions will arise when local bodies will be either uninterested or unequipped to make sound estimates. If the federal government estimates the demand and appraises the value of supplies provided, it must examine alternate sources of supply, appraise other possible demands upon those supplies, and estimate costs of delivery from possible sources of supply to the city or industry. In short, the federal government will be as deeply involved in municipal and industrial water supply as it is in irrigation and flood control.

A closely related question is posed by the possible federal role in the construction of canals and pipelines from the source of supply to the city or industry. Economic efficiency in water resources development does not necessitate federal participation in this activity. However, cities report difficulty in financing public works, and federal financing is a convenient alternative. Thus, the Housing and Home Finance Administrator is authorized to loan funds for planning public works, including municipal and industrial water supplies, and it is also authorized to loan funds, with priority to small communities, to construct such facilities.[148] A number of projects planned by the Bureau of Reclamation also have raised the question of whether the Bureau should build the delivery facilities as well as the storage.[149] Finally, Senator Lyndon Johnson has introduced legislation which would authorize the federal government, through the Corps of Engineers, to make loans to finance municipal and industrial water delivery facilities.[150] Accordingly, the federal government is moving in the direction of a more active role in this traditionally local activity, in part because economic efficiency requires that all water supply needs be taken into account in multiple-purpose planning, but also because of the difficulties (whether real or assumed) confronting local units of government in financing such development.

The third question is that of repayment of costs. Will municipal and industrial water supply development be added to the list of federally-subsidized water resources development functions? If low-flow regulation is provided on a nonreimbursable basis, it will be difficult to avoid such a policy. What would be the rationale for such subsidies, and how would they be administered by the various water resources development agencies so as to assure a consistent policy among them?

[148] 69 STAT. 643 (1955), 42 U.S.C. §1492 (Supp. III, 1956).
[149] *E.g.*, the Canadian River Project.
[150] S. 1190, 85th Cong., 1st Sess. (1957).

In brief, it appears that the federal government is entering in a substantial way the municipal and industrial water supply field, an activity traditionally considered to be a state and local responsibility. The ramifications of such action and the policy issues involved have not been examined by the five study groups. It is a field of vital concern to every community, every water-using industry, and the general economy. The issues should receive careful attention from policy-makers before precedents are established which are difficult to overcome.

VI

CONCLUDING OBSERVATIONS

The relatively small area of disagreement among the study groups on the major water resources policy issues considered in this analysis is impressive. The only sharp differences which have been identified lie in the power field. In this area, the cleavage among the study groups is so great and so long-standing that the possibilities for reconciliation do not appear promising. For the other policies analyzed in this paper, the differences identified are, for the most part, differences of detail rather than of principle. However, it is also pertinent to observe that all study groups did not express themselves on each issue. Furthermore, there are some pronounced differences in emphasis and basic concepts, such as the obvious objective of the Task Force to minimize federal participation in the conduct and financing of water resources activities. Nevertheless, when the specific recommendations are analyzed as they apply to flood management, irrigation, and municipal and industrial water supply, they all visualize approximately the same general objectives and the same federal role in the conduct of these functions.[151]

In considering the foregoing observation, however, one should not minimize the extent of the gulf between the reports of the Cooke Commission and the Survey Commission, on the one hand, and the Hoover Commission and its Task Force, on the other. The differences over power, which are the most clearly defined, are of major significance, because power is an important purpose of most multiple-purpose water resources development systems. To the extent that hydroelectric power development is stymied because of the controversy as to how it should be undertaken, water resources development for other purposes is adversely affected.

There is also one other difference among the reports which is more difficult to define but is, nevertheless, an important one. The Cooke Commission, in particular, visualizes the national water resources development program as a positive, dynamic force in the economic growth of the country, a view which does not appear to be shared to the same extent by the Advisory Committee, the Second Hoover Commission, and the Task Force. This difference is reflected best in the treatment of water

[151] Craine suggests that "apparently the Presidential Advisory Committee focused its major attention on sifting out those things which were acceptable from such earlier studies as the first Hoover Commission report (1949), the President's Water Resources Policy Commission report (1950), and the Report of the Missouri Basin Survey Commission (1953)." Craine, *Natural Resources and Government*, 16 PUB. ADMIN. REV. 212, 215 (1956).

resources development as a stimulus to regional growth. In supporting the position that regional development is an important objective of the national water resources program, the Cooke Commission makes the following significant statement:[152]

> . . . a new regionalism began to develop as an economic revolt against the centralization of industrial and commercial wealth in the older Northern States. It was directed at the tendency to restrict the new regions to a semi-colonial, low per capita income, raw material producing status. The revolt struck at all the institutional arrangements which tended to perpetuate this centralization. Particularly it found in the river basin program a means of developing better balanced rural-industrial economies, which would increase opportunity, hold population and raise general income levels.

Although the Second Hoover Commission and the Advisory Committee take cognizance of the impact water resources development has had upon regional growth, the concept of national water resources development as a dynamic force in the economy is lacking. This difference would have an important bearing upon the kind and magnitude of the national water resources development program.

Nevertheless, in view of the relatively large area of agreement among the study groups, it would seem reasonable to expect an early resolution of many of the issues. But this does not appear to be the case, for a number of reasons. First, important recent trends are contrary to the policies recommended. This is most notable in the area of cost-sharing. The five study groups have recommended that state and local interests bear a greater share of the cost of water resources development. However, recent legislation has moved in the opposite direction. The amendments to the Hope-Aiken Act provide that construction costs for flood-control facilities built under the provisions of the act will be fully nonreimbursable. Flood-damage insurance is to be subsidized. Federal grants are being made to finance the construction of pollution-abatement facilities.[153] And subsidies for irrigation in the thirty-one eastern states, as well as the seventeen western states, are permitted by the amended Hope-Aiken Act. Thus, in spite of much sentiment to the contrary, the long-established trend toward greater federal subsidies for water resources development continues.[154]

Another reason that the water resources policy issues are far from resolution is that they are constantly changing. Although some of the issues have remained the same for many years, important new ones continue to emerge. Many issues which are prominent today were not considered, or were superficially treated, by the study groups. For example, flood-damage insurance receives little attention in the five reports. The issues raised by federal participation in humid-land irrigation are scarcely considered. The rapidly increasing demands for outdoor recreation facilities and municipal and industrial water supplies, the growing seriousness of stream pollution, and the impact of new technology on power development and water use

[152] 1 COOKE COMM'N REPORT 4.

[153] Water Pollution Control Act, 62 STAT. 1158 (1948), as amended, 33 U.S.C. §466d (Supp. III, 1956).

[154] This appears to be contrary to Temple's conclusion that "increased local financial responsibility will be a characteristic of emerging policy." Temple, *Our Evolving National Water Policy*, American Forests, Sept. 1956, pp. 34, 41.

have changed the character and significance of the water resources policy issues associated with these activities. As a consequence, the study group reports are, to some extent, already out of date. This may be attributed in part to the failure of the study groups to consider some of the important issues; but, in part at least, it stems from changed conditions which were not evident until very recently.

Finally, this review suggests that the study group reports do not clarify the objectives of the national water resources development program. The reports recognize and accept economic and social goals, but they fail to define the extent to which economic efficiency and noneconomic considerations should be the basis for determining the kind and magnitude of the water program. Major reliance is placed upon the benefit-cost analysis, which, if properly made, reflects the economic efficiency of the project, but does not take into account social and human values.[155] Yet, a review of existing practice and events leading to federal action in the water resources field clearly demonstrates that certain social objectives were paramount concerns in deciding what the federal role should be. Thus, much of the flood-control legislation was enacted to prevent human suffering stemming from flood disasters; reclamation programs were designed to provide family-farm settlement opportunities; and power was to be marketed to foster the widespread use of electricity.[156] Such goals were and continue to be important because the nature of the federal government's role in the water resources field is determined by the interaction of political forces which reflect social and human values and local and group economic problems, as well as national economic needs. And the matter is further complicated by the fact that projects may receive political support for quite different reasons. Thus, some supporters may have broad humanitarian objectives, while others may be interested only in the direct benefits that will accrue to them. Possibly, then, it is too much to ask that policy objectives be explicitly stated. Nevertheless, if one assumes that policy should reflect the popular will, the first task of the policy-maker is to express what the people wish to accomplish. However, this review seems to indicate that despite much attention and study of water resources policy, the nation remains divided or unclear as to what it is seeking to attain through many of its water resources development programs.

In summary, then, it is evident that although there is much agreement, a stable and consistent national water resources policy is far from attainment. The dynamic nature of the problem and the continuing inability of the Executive and the Congress to establish clearly defined and acceptable objectives suggest that water resources policy issues will remain a subject of debate and controversy for some time to come.

This review also suggests several basic problems inherent in the establishment and administration of national water resources policy. First, it points up the growing

[155] The Cooke Commission gives greater weight to noneconomic considerations than the other four reports.

[156] There is a question of the extent these factors actually motivated federal action, since other factors also played an important part. Nevertheless, federal action was justified to the public, in large measure, on the basis of objectives such as these.

complexity of the water resources policy field. The number of issues which have been cited, the ramifications of each, the somewhat differing views expressed, and the physical, economic, and political information essential to an understanding of the issues underscore the difficulties confronting the policy-maker. The layman who wishes to understand and express himself intelligently upon them faces an even more formidable task, because of the background of information required and the conflicting views which he hears. Under these circumstances, the strength of the special-interest group is enhanced, and the difficulties of the conscientious legislator and administrator in establishing wise policies are increased. Thus, the role of citizen groups and educational and research institutions becomes more important in the attainment of prudent water resources policies.

Second, water resources policy formulation is difficult because it is not just one field of activity; in reality, it is composed of segments of many fields. Since water resources development encompasses navigation, national water resources policy is inextricably intertwined with national transportation policy. Since water resources are important in outdoor recreation, water resources policy is involved in the national recreation policy. Water resources development is also intimately concerned with fish and game, the production of power, public health, the production of food and fibre, and the welfare of farmers. Separate federal programs have been developed for each of these fields. Each is governed by its own set of policies, and each involves special political and economic interests. Water resources policy cuts across all of them, and the policy-maker is confronted with the task of evolving a policy which is valid as it applies to each field as well as to water resources. Many questions, accordingly, arise: Water resources development can increase agricultural production and provide farm settlement opportunities; but in terms of the total federal agricultural program, does water resources development constitute the best means of supplying future requirements for food and fiber? Water resources development may offer the opportunity to provide navigation facilities; but in terms of the national transportation program, is this the best means of meeting an area's transportation needs? Water resources development may offer an opportunity to provide recreation facilities; but in view of national or area recreation needs, does this constitute the best investment of recreation development funds? Problems such as these give an unusual scope and complexity to water resources policy and the administration of water resources development programs.

Third, water resources policy poses serious problems in intergovernmental relationships. The federal government, because of its superior financial resources, has become active in many fields traditionally considered to be local and state responsibilities. In the field of water resources development, however, certain inherent characteristics of the activity have made it even more difficult for the federal government to avoid assumption of responsibility. Thus, economic efficiency frequently requires that water resources development projects be designed for system operation. But since streams flow across state lines, such systems exceed the jurisdiction of

localities and states; and in as much as special interstate institutions have been difficult to establish, the federal government has offered a logical alternative. This factor, combined with certain constitutional obligations and the superior financial resources of the federal government to meet the large investment requirements of water resources development, has, accordingly, deeply involved the federal government in the water resources field. Since economic efficiency also dictates that water resources development be multiple-purpose in nature, such activities as municipal and industrial water supply, recreation, and pollution abatement, which are normally considered to be state, local, and private responsibilities, must be taken into account in planning federally-sponsored water resources facilities. When a federal agency plans an irrigation project, therefore, it cannot, in the public interest, avoid becoming involved in these activities, too, which are assumed to be nonfederal responsibilities. In short, since water resources development is interstate and multiple-purpose in character, efficiency will not permit a sharp division between federal activities and what has normally been considered state-local-private activities.

The problem is well illustrated by the analysis of the policy issues applicable to municipal and industrial water supply. A similar problem is faced in pollution-abatement, recreation, and fish and wildlife activities. If one assumes that there is merit in continuing to rely primarily upon state, local, and private agencies to conduct these governmental activities, the task for the national policy-maker is to make it possible for the responsibility to be nonfederal, while permitting the state, local, or private entity to avail itself of the economies of multiple-purpose, interstate stream development.

Finally, one is impressed by the burden of responsibility being placed upon federal administrators as a consequence of increased federal subsidization of water resources development. Navigation and flood-control costs are borne almost entirely by the federal government. It is expected that low-flow regulation costs will also be nonreimbursable. Western irrigation, too, involves large-scale subsidies, and some subsidization of eastern irrigation and drainage is permitted by the Hope-Aiken Act. And legislation is pending which would permit substantial allocations of costs to recreation on a nonreimbursable basis.[157] This increased subsidization of water resources development by the federal government raises two issues—namely: (1) Is it appropriate to subsidize, to such a great extent, the direct beneficiaries of water resources development projects at the expense of the general taxpayer? and (2) Can efficiency in water resources development be attained when the direct beneficiaries pay such a small share of the cost? The first issue is a question of equity, and the approach to it is clearly marked. In a democratic society, if the general public, with full knowledge of what it is doing, supports a given action, it is an action to be accepted. The second issue, however, raises a somewhat different question. Theoretically, it is possible to achieve efficiency in attainment of water resources development objectives, even though the federal government bears all the cost. By

[157] See S. 1164, 85th Cong., 1st Sess. §4 (1957).

comparing the estimated accomplishments with the costs in an objective manner, efficient projects can be designed and developed. But are our institutions capable of achieving this goal when many benefits are local and specific, when the task of analysis is so complex, and when responsibility for bearing the cost is diffused over the entire population instead of borne by those who benefit directly?

Much of the burden for meeting this problem rests upon the engineers, scientists, economists, and administrators who plan the projects. Their position merits consideration. First, their tools are, in many ways, inadequate to the task. Estimates of the physical and economic effect of a project depend, in large measure, upon judgment, instead of being calculable with mathematical precision. Many of the values with which they must deal cannot even be expressed in monetary terms, and many that can are subject to a wide margin of error. Second, in rendering the judgments essential to designing and evaluating a project, the analyst is subject to enormous pressures to produce the "right" answer. Special-interest groups may want the project; congressmen may be supporting it; the "interest" of his agency may be served by finding the project justified. Support for the project is sharply focused, because many individuals can identify themselves with the benefits from the project. But, unless other interests are adversely affected, there is little in the way of a counter-force, except the analyst's judgment, because the costs are diffused, and those who benefit have little in the way of costs to offset against the obvious benefits. The burden upon him is great. Operating under such pressures and with so much depending upon his judgment, is it fair to the civil servant to expect him to produce an objective result which best serves the interest of all of the people? This situation gives a special urgency to increasing the precision of the engineering, scientific, and economic analysis involved in designing and evaluating water resources projects. Also, if the public interest is to be served, it places a heavy responsibility upon the public officials and the groups directly interested in a given project to define the objectives of the project clearly and appraise objectively its prospective accomplishments.