

October 1967

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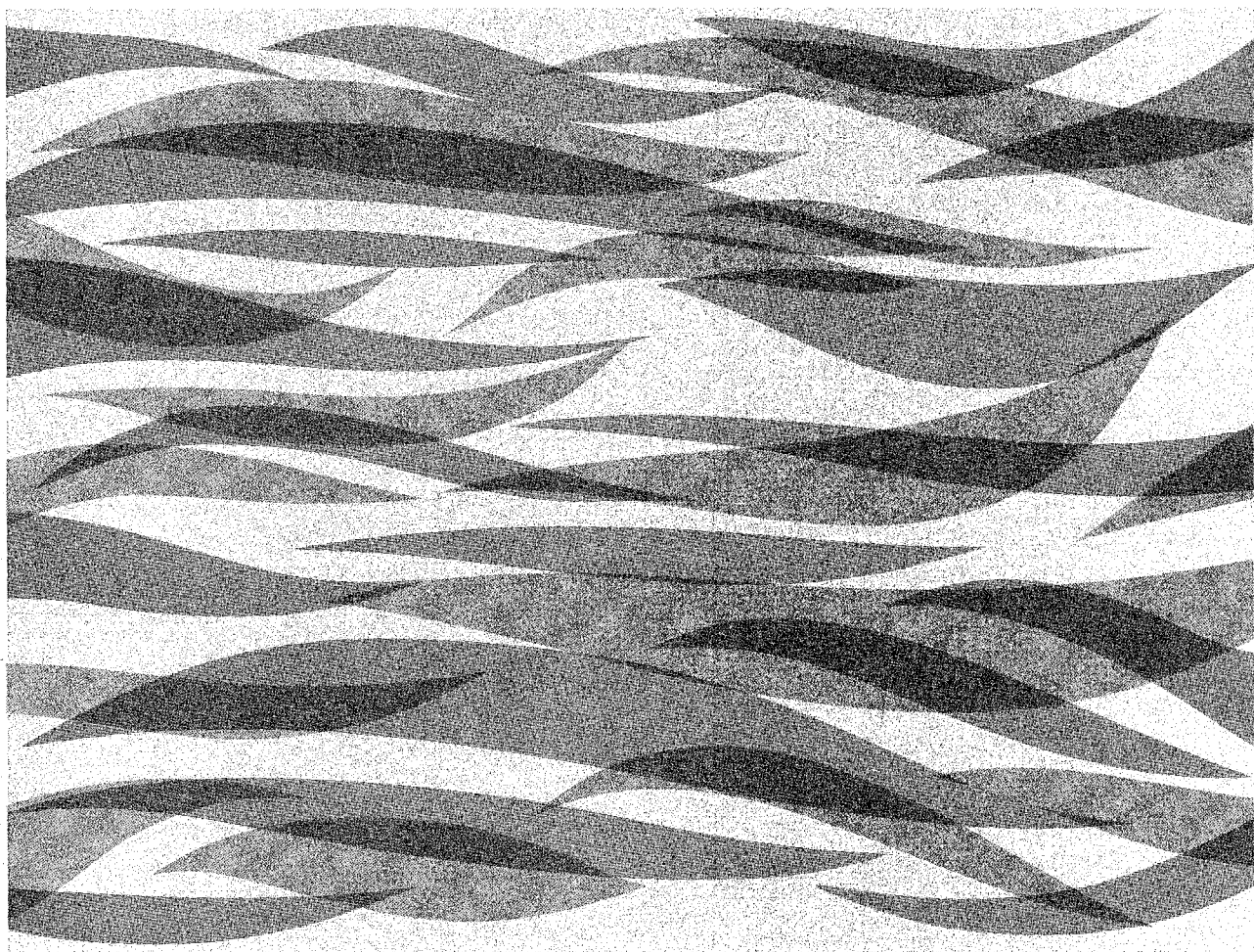
Recommended Citation

Kasperson, Roger E., "Political Organization and the Planning of Water Resource Development in the Farmington Valley : a Preliminary Profile" (1967). *Special Reports*. 38.
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Report No. 5

October 1967



INSTITUTE OF WATER RESOURCES
The University of Connecticut

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OF WATER RESOURCE DEVELOPMENT IN THE
FARMINGTON VALLEY — A Preliminary Profile

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ROGER E. KASPERSON
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The work on which this report is based was supported in part by funds provided by the United States Department of the Interior, Office of Water Resources Research, as authorized under the Water Resources Act of 1964, P. L. 88-379. The author wishes to acknowledge his indebtedness to George Downey, Research Associate for the project.

POLITICAL ORGANIZATION AND THE PLANNING OF WATER RESOURCE DEVELOPMENT IN THE FARMINGTON VALLEY: A PRELIMINARY PROFILE

ROGER E. KASPERSON*
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Past research has devoted a considerable amount of attention to the problems of political organization in the management and development of natural resources.¹ Generally, such research has called attention to a severe problem of political fragmentation and a division of functional responsibility among a large number of governmental bodies and agencies. At the operational level, this has all too often produced overlapping responsibilities, duplication of effort, conflicting policies, and inadequate communication among water resource agencies. Frequent recommendations have called for the integration of responsibilities into a single agency which would consider the multiple uses and problems of resource management.²

The purpose of this study is to examine critically the pattern of governmental organization and the process of planning in one river basin—the Farmington Valley, which contains the largest of the tributaries to the lower Connecticut River. Specifically, the present study seeks to analyze the validity of the hypotheses suggested in prior studies as to the problems of governmental organization, the role of water resource interest groups (as represented by the Farmington River Watershed Association), and local attitudes toward the public interest. The concern, then, is with the role which each plays in the management of resources in the Farmington Valley and the contribution each makes to serving and implementing the public interest, however that may be defined.³

Finally, during the author's affiliation with The University of Connecticut, a technical study of the

valley was under way by the Travelers Research Center, supported and financed by the Farmington River Watershed Association and the Connecticut Water Resources Commission. The appearance of this plan in February 1965, provided the opportunity to make a study of a study. In other words, research could investigate the methods by which a plan is formulated; the roles assumed by individuals, institutions, and agencies; and the attitudes toward the plan among various interested agency personnel and among members of the general public.

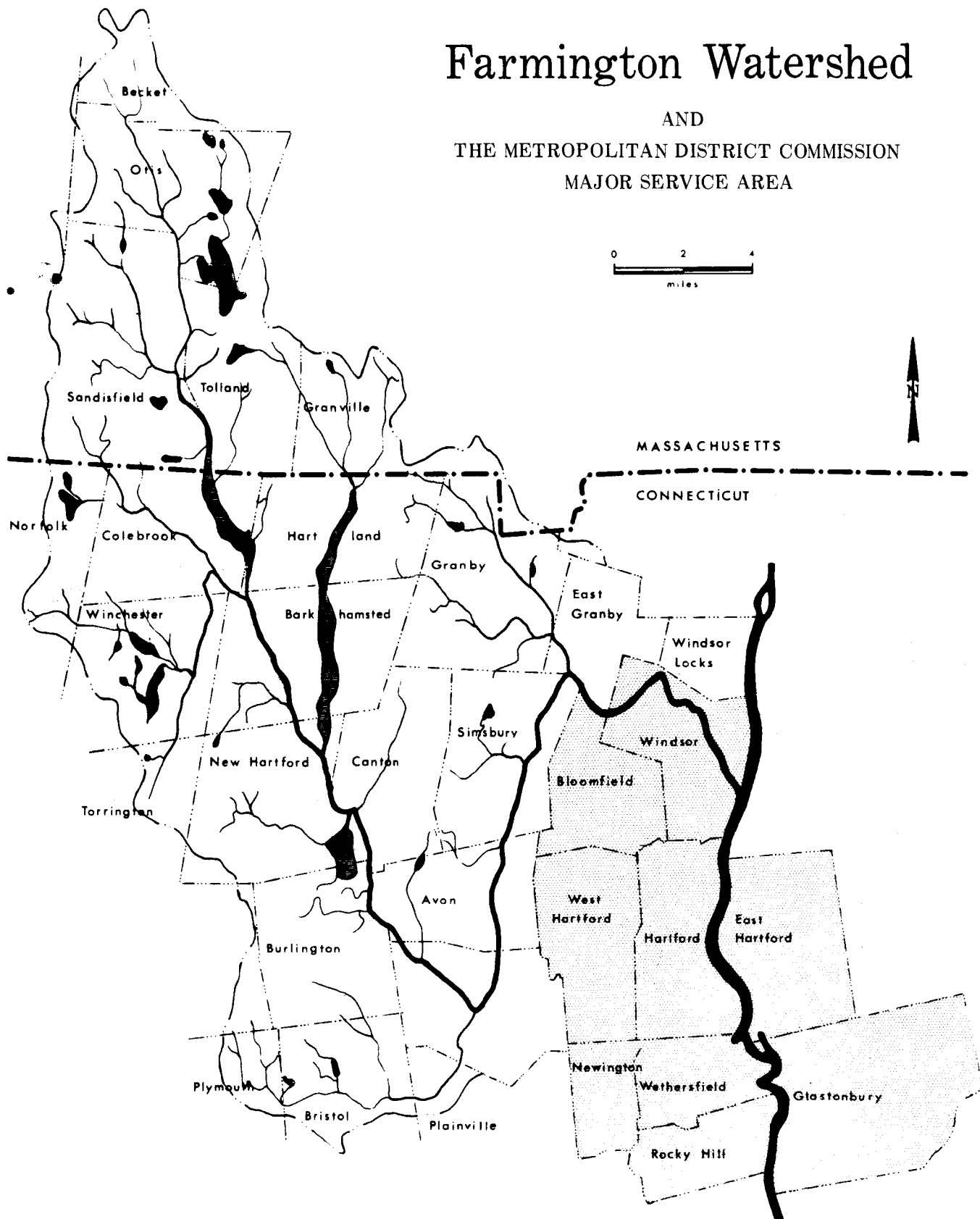
DATA SOURCES

A number of sources provided information and data for the study. Open-ended interviews, averaging about one hour in length, were conducted with twelve of the 22 governmental agencies or organizations concerned with resource management in the Farmington Valley. Questionnaires (see the Appendix) mailed to all 709 members of the Farmington River Watershed Association yielded a return rate of 45 percent,⁴ very high for such questionnaires. These interviews and questionnaires provide most of the information for the present report. Also, 383 interviews—stratified according to user characteristics and distance from the river—taken among the general public provide additional information. Finally, public officials representing most of the towns in the valley were also interviewed. These sources, together with published reports and other documents, form a useful collection of data and information from the various govern-

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Farmington Watershed

AND
THE METROPOLITAN DISTRICT COMMISSION
MAJOR SERVICE AREA



mental levels involved with the question of water resources in the Farmington Valley.

INTRODUCTION TO THE BASIN

The Farmington River, with a drainage area of 602 square miles, is the lowest major tributary of the Connecticut River. Although 75 percent of the basin lies wholly in the State of Connecticut, the remaining one-fourth includes the headwaters of the Farmington River and lies in Massachusetts (see the accompanying map). The political boundary which divides the basin between two states remains one of the major facts of life for planning in the valley, even in a time given to pious statements on the benefits of interstate cooperation. The area of the basin is further subdivided into eighteen Connecticut and five Massachusetts towns, each of which has important responsibilities for any major planning efforts in the watershed area. The cooperation among these communities and their close interrelationship with governmental and planning agencies are critical to resource management schemes.

The functions of the valley are by no means restricted to its own area. In addition to serving as a major supply source for a number of valley cities and towns, the Farmington River also provides water for the Hartford metropolitan area. In 1965, a total of 500,000 persons obtained their water from Valley sources, most of it supplied through the Metropolitan District Commission facilities. The valley's population is expected to double by 1980 and triple by the year 2000. In view of population increases in the Hartford metropolitan area, there may be as many as 1.5 million users of the Farmington water supply by the end of the next 50 years. In addition, per-capita water consumption will probably increase. Hence, there is presently a need for careful planning and utilization of existing water resources.

Increase in valley population and the spread of urbanization out from the Hartford population cluster, combined with an increase in the time and affluence which make for more leisure, will inevitably place heavy demands upon recreational facilities. It might well be argued that present recreation is already impeded by the use restrictions placed upon water supply sources, by pollution along stretches of the river, by the development of many areas for private uses, and by inaccessibility or inadequate facilities. Planning for increased recreational opportunities and facilities clearly represents one of the more difficult areas for resource development in the coming years.

Not all aspects of water resources in the Farmington Valley have, however, been so beneficial. The valley has a record of flooding with major occurrences on the average of every six years. Moreover, flooding over the last 40 years has occurred in widely scattered months, so that protection must be provided throughout the year. The flood of 1938 left damage estimated at \$2,000,000, whereas the 1955 floods resulted in 31 deaths and an estimated \$72,000,000 in damage.⁵ Obviously, future plans must incorporate adequate flood protection throughout the valley.

THE FARMINGTON PLAN OF 1965

Financed jointly by the Farmington River Watershed Association and the Connecticut Water Resources Commission, the Travelers Research Center, under study director Dr. Paul Bock, undertook in 1963 the responsibility of preparing a plan for the Farmington Valley. The purpose of the plan was "to determine the optimum water resources system for the Farmington Valley" and how each element (dam, zoning regulation, fish-lift, etc.) would have to be designed or detailed as a separate project before it could be implemented. Development of the plan involved a six-step procedure, summarized as follows: (1) The Center appraised the present water resources system, including an inventory of the distribution, quantity, and quality of present valley waters. (2) An examination of population and water use trends permitted a projection of water needs to the years 1965, 1985, and 2015. (3) Next, the study formulated alternative systems (each including a set of reservoirs, water use facilities, regulations, and operating procedures) for meeting the projected needs. (4) Using established records of precipitation and stream-flow, each alternative was then tested by computer simulation. (5) An economic evaluation of the relative costs and benefits attempted to identify the optimum management system. (6) Finally, findings suggested recommendations for a schedule, administration, and financial means for implementation.

Within the context of these procedures, agencies and the general public participated at several points. Governmental agencies concerned with resource management in the Farmington Valley were contacted early in the study for data collection purposes. *The Farmington River Watershed Association Newsletter* kept the general public informed and invited people to submit suggestions or concepts for testing. At the conclusion of the study, three conferences were held with local officials, agency representatives, and professional

personnel. At a later stage, an open meeting provided the general public with ample opportunity to air its views.

The recommendations of the plan embraced a wide range of needs. First, the plan supported the completion of several structural innovations already in process or authorized: The Corps of Engineers Colebrook River Dam and the authorized Sucker Brook and Clam River projects. Second, the plan advocated purchase of riparian rights to supply water to hydropower plants and divert these waters for other purposes. Third, efforts to improve recreation would include the controversial suggestion to allow a full range of recreation on Barkhamsted Reservoir; the construction of public recreation facilities at Barkhamsted, Compensating, Otis, and Colebrook reservoirs and at Highland Lake; the building of a fishway at Rainbow Dam; and, the charging of adequate fees for public recreation facilities on all major reservoirs. Fourth, the plan called for pressing a wide variety of pollution abatement programs. Fifth, efforts to improve scenic beauty included saving key wetlands, open spaces, and natural areas and augmenting low stream flows. Sixth, flood control recommendations called for an expansion of flood plain zoning, encroachment lines, flood warning systems, and flood proofing. Finally, the plan proposed the consideration of a single-agency, multi-view, managerial responsibility for the planning and implementation of water resource development plans.

ORGANIZATIONAL STRUCTURE OF RESOURCE MANAGEMENT

The list of agencies concerned with resource management in the Farmington Valley points up the problem of the proliferation of responsibility. *Federal agencies* include The United States Geological Survey, the United States Public Health Service, the U. S. Army Corps of Engineers, the Soil Conservation Service, the United States Fish and Wildlife Service, the National Park Service, the United States Department of Agriculture, the Federal Power Commission, and the United States Weather Bureau. *Regional interstate agencies* include the New England Water Pollution Control Commission, the Connecticut River Watershed Council, and the Connecticut River Valley Flood Control Commission. *State agencies* involved are the Connecticut and Massachusetts Water Resources Commissions, the Connecticut Department of Agriculture and Natural Resources, the Connecticut and Massachusetts Departments of Public Health, the Connecticut Board of Fisheries and Game, the Connecticut Development Commission, and the Connecticut

Flood Control and Water Policy Commission. *Regional intrastate agencies* include the Capitol Region Planning Agency and the Water Bureau of the Metropolitan District Commission. *Basin-wide organizations* are the Farmington River Watershed Association and the Farmington River Valley Flood Control Commission. Finally, there is the quilt-work of *local civil divisions* (i.e., 23 towns and cities), each of which has a strong role in the public management of resources, and also the numerous *resource interest groups* (e.g., fish and game clubs, sportsmen's clubs, etc.).

Concerning the activity of these organizations in managing the natural resources of the Farmington Valley, it is possible to put forward four hypotheses for testing: (1) The proliferation of governmental agencies has bred overlaps in responsibility and conflicts in policy. (2) There is among these agencies a low degree of interaction and information-sharing, and this is a major obstacle to efficient planning in the valley. (3) Between governmental agencies and local political officials, a low degree of communications tends to thwart a realization of the potential contributions which local communities can offer to planning efforts. (4) These governmental agencies contributed extensively to and now support the Farmington Plan developed by the Travelers Research Center. On the basis of preliminary results, some tentative evaluation may be made of each of these hypotheses.

(1) The evidence from the present study supports the findings of many other researchers on the problems arising from the proliferation of functional and spatial responsibilities over natural resource management. The major difficulty arises from the division of the Farmington Valley between two states. All the way down the line state agencies duplicate functions in handling the water resource problems of one valley. Even within a single state, however, overlappings occur, particularly between the Connecticut Water Resources Commission, functioning as a multiple-use oriented agency, and the various single-purpose agencies, such as the State Department of Public Health, the Connecticut Board of Fisheries and Game, and the U. S. Army Corps of Engineers. More serious, however, are the interagency conflicts over water resources policy. These conflicts are particularly apparent between those agencies which deal chiefly with water supply (i.e., the Metropolitan District Commission, the State Public Health Department) and those which are concerned primarily with recreation (e.g., the National Park Service, the Connecticut Board of Fisheries and Game). In the case of the Farmington

River, these policy conflicts center about the advisability of recreational uses of water supply reservoirs.

(2) Although it has been alleged frequently that the multitude of agencies managing resources suffer from inadequate communications, the findings of the present research do not support such an interpretation. It should be noted, however, that interagency communication is a difficult item to measure, for there are different types of contact (e.g., written, telephone, face-to-face) and, in each message, a variable quality of content which can be difficult to record.⁶ Messages can be classified into such categories as factual, advice-giving, or assistance-seeking. In this study, the agency representative's own estimate served as the measure of both quantity and quality. By ascertaining whether various agencies were well-informed of the position of other agencies upon particular issues, it was possible to test operationally the sharing of knowledge which occurred.

Generally, the research uncovered a fairly impressive state of interagency communication and sharing of knowledge. Agencies such as the Public Health Departments and the State Water Resource Commissions are in nearly continual daily contact. Peripheral agencies reported more occasional contacts, but these were sufficient for adequate information transfer. Table 1, as an example of prevalent information transfer patterns, shows a detailed communication pattern for one water resource agency.

(3) Data concerning the interaction between government agencies and local political officials are less complete. It does appear that those agencies concerned chiefly with supply and quality of water enjoy a high degree of communication with local communities. The Metropolitan District Commission (Hartford) reported, for example, that communication with the member towns was an everyday affair and encompassed a wide variety of issues. The Sanitary Engineering Division of the Massachusetts Department of Public Health estimated its official correspondence with the 351 towns of the state at fifteen letters a day and about 50 telephone calls or face-to-face contacts a day. It is worth noting, however, that these contacts are either regulatory or of the advice-giving type for the agencies and not of the information-seeking category. In other words, it represents largely a one-way flow of information. In addition, other agencies, among them some multiple-resource and recreation agencies, had contacts of a more sporadic nature with local levels of the political hierarchy.

(4) The role of agencies in formulating and supporting the Farmington Plan, as developed by the Travelers Research Center, varied widely. Most agency representatives questioned indicated that they were involved extensively in the early part of the plan (i.e., in the data-gathering stage) but only very intermittently in the latter part (i.e., the evaluation and recommendation stages). To be accurate, however, they were in fact given ample opportunity to react to a tentative version of the plan's reports.

Although evaluation of the calibre and validity of the plan was, on the whole, quite favorable, some reservations did emerge. Several agency representatives pointed out that, perhaps because of the limitation of time and funds, the data-gathering effort did betray certain flaws. First, the study drew heavily from existing studies and information; it added very little in the way of original data. In some cases, existing data were not updated adequately for the purposes of the study. Several interviewees noted errors in the discussion of the sources of pollution. Others saw limitations in the estimate of the potentiality of the Connecticut River for recreational uses. One critic countered that, considering the political pressures and issues involved in evaluation, least-cost criteria may not be the most appropriate means of evaluation. Another questioned the use of straight line projections of past population trends to estimate future population levels.

As the research team at the Travelers Research Center clearly anticipated, adverse reaction concentrated on the more controversial of the recommendations. A representative from the Connecticut Public Health Department said pointedly: "All uses really conflict." Agencies concerned with water supply voiced strong opposition to the recommendation for recreational use of water supply reservoirs. A representative from the Metropolitan District Commission contended: "It is a premature suggestion. We don't know enough yet about viruses. There is, for example, a higher degree of incidence of hepatitis in the Midwest." Even members of the Sportsmen's Club of Hartford objected to a "full range of recreation" on Barkhamsted Reservoir, on the grounds that it would allow for high-speed boating and water skiing, activities which in their opinion would detract from fishing and swimming in the reservoir. It is in this kind of area that attitudes among the general public could play an important role in defining the public interest. The most general criticism may be the most telling, however. Many interviewees in a wide rep-

resentation of agencies feared, as expressed in the words of one interviewee, that "unless a viable course for implementing the recommendations is established, the study will be simply an addition to the ever-growing library of tinted tomes which are created to accomplish something but which, in reality, rarely do."

THE FARMINGTON RIVER WATERSHED ASSOCIATION: A PROFILE

The Farmington River Watershed Association is an interesting object of study, for a number of reasons, not the least of which is the organization's position as one of the most vigorous and successful of its kind in northeastern United States. Established in 1953, it had in 1955 a total membership of only 48 paid members and a total working budget of \$206.00. By 1965, the membership had increased to 709 members and the budget to over \$12,000.00. The major push came in 1958 with the appointment of Sydney Howe as full-time executive director.

Equally significant as a testimonial to the vigor and effectiveness of the association are the achievements for which it has been responsible. Perhaps the organization's major effort has been in the field of water quality, where both Sydney Howe and his successor Harold Peters have administered a vigorous program of pollution abatement in the many towns located in the valley. Considerable attention has centered on the installation of sewage treatment plants and the elimination of industrial wastes. The directors have worked intensively for pollution control in each community.

A major achievement occurred in 1964 when, after a prolonged campaign by FRWA, the Army Corps of Engineers retreated from a double-purpose (flood control and water supply) design for the Colebrook Dam and agreed to incorporate into its plans additional use considerations. The result was the eventual construction of three dams, each including an extra 1.6 billion gallons of water for wildlife and recreation purposes and for augmentation of low river flows.

Certainly, one of the more valuable functions of the association has been as an agent of communication and information. By lectures, the FRWA film, nature trails, a quarterly (now bimonthly) newsletter and an annual report, and the mass media, the association has presented conservation information to a wide spectrum of the valley's inhabitants. Moreover, it has been an effective answering service for an almost unlimited variety of conservation inquiries from interested citizens. The as-

sociation's activities earned for it in 1964 the White Memorial Foundation award for its "imaginative approach and tangible contributions to the problems of flood control, preservation of open space, wildlife management, stream pollution, nature education, pesticide control, recreation and stream-flow stabilization."

Undoubtedly, the crowning achievement of the association, however, was its successful campaign for a comprehensive study of resource development in the Farmington Valley. FRWA managed to raise \$19,000 through two separate grants: \$15,000 from the Hartford Foundation for Public Giving and \$4,000 from the Ensign-Bickford Foundation. The General Assembly of the State of Connecticut then agreed to allocate, via the State Water Resources Commission, a \$45,000 contribution. The resultant study provides both the Farmington Valley and appropriate governmental agencies with guidelines for future management and development.

Analysis of Membership: Relatively little is known about resource interest groups, their linkages with the general public, and their role in the planning process. The geographical distribution of FRWA members is interesting in its own right. The overwhelming proportion of the 709 members are drawn from towns in the Connecticut Valley: Avon (65), Bristol (31), Farmington (108), Simsbury (99), West Hartford (42), West Simsbury (31), Windsor (31), and Winsted (31). The only large concentration of members outside of the valley is in Hartford, the mailing address of 53 members. It is most disturbing that although 25 percent of the Farmington Valley lies in Massachusetts, only two of 709 members represent that state. Moreover, none of the Massachusetts towns belonged to the association during most of its history, and only two towns are presently members.

In Connecticut, the membership comprises a strong representation of towns, industries, and private organizations. Table 2 indicates composition. The large number of industries is a useful segment financially since contributions by firms are often greater than those by individual members and because of the need to deal with industries as a source of water pollution. The absence of a larger number of communities is, however, a limitation which it is important to overcome. The infrastructure provided by the series of garden, fish-and-game, and conservation clubs is a very valuable addition in that such clubs contribute substantially to a network of information flow and political participation.

Members of the FRWA show long periods of

residence in the Farmington Valley (Table 3). Fully 46 percent of all members responding have lived in the valley for more than twenty years. This is scarcely surprising since degree of commitment to community and area problems is clearly related to the individual's sense of community identification and membership in a particular social fabric. The distribution of membership also suggests that group to which recruiting efforts might bear the most fruit.

What are the mechanisms by which individuals first learn about a resource interest group such as FRWA? Table 4 perhaps offers some clues. The results recorded in Table 4 are an eloquent testimony to the efficacy of interpersonal communication in motivating participation on the part of other individuals. In fact, 39 percent of all respondents learned of the association through a member of the organization—evidently, the best publicity and recruitment media are the members themselves. Another 21 percent first heard of FRWA through a friend. Mass media, by comparison, proved relatively inefficient in this case.

Table 5 contains some suggestions for individual motivation. It would appear that people, for the most part, do not join such an organization because of specific grievances. Rather, responses to this question (i.e., Why did you first join the FRWA?) indicate a general concern for conservation and development of the valley. This may even reflect a general ideological orientation to natural resource questions. Responses to a question asking what the FRWA should do that it does not do now bear out this statement. 132 persons (39 percent) did not even reply to the question, and 21 percent of those who did reply indicated that they were satisfied with the present program. The remainder (Table 6) were distributed among a wide variety of suggestions, the most important of which (13 percent) advocated the prodding to action of agencies and towns.

Members as Activists: Data gathered in the study indicate that FRWA members are also involved in other forms of activity centered upon water problems. Table 7 reveals that 45 percent of all respondents had engaged in some other activity and that approximately half of these were involved in activities requiring a major commitment (i.e., gladiatorial activities).⁷ This supports the present author's earlier findings, in investigating a water resource dispute in Massachusetts⁸, that individuals once involved tend to engage in multiple rather than single political activities. Moreover, the very low rates of participation in such issues among the

general public must be kept in mind in order to view these characteristics in proper perspective.

Attitudes Toward the Farmington Plan: On the whole, members of the FRWA were cognizant of the Farmington Plan. 248 of the 340 (73 percent) indicated that they had heard of it. Ordinarily, this might be a nearly unbelievable degree of familiarity, but in this specific instance it is not surprising. The FRWA has stressed the plan at all its meetings, had distributed to members an attractive pamphlet summarizing the plan, and had included progress reports in its newsletters. In addition, the mass media had also publicized the plan widely. Given such an intensity of effort, a saturation of communication linkages, and highly-motivated segments of the population, it may well be more astounding to account for the *uninformed* residual of 26 percent, one out of every four members, who had not even *heard* of the plan. Is there a portion of the population which will always be impervious to such communication efforts?

Among those who had heard of the plan, the overwhelming proportion strongly supported it (Table 8). In fact, of 196 replying to a question soliciting their opinion of the plan, none opposed it and only ten labeled it unrealistic. That 43 percent of the respondents did not choose to answer the question may reflect either a lack of general knowledge or a lack of concern on their part.

Members' Views of the Public Interest: Analysis of the questionnaire may also provide some insight into local attitudes regarding the public interest. While these reactions may not reflect accurately prevalent attitudes among the population at large (this will be the subject of subsequent evaluation), they will provide some clues as to the opinions held by the more motivated segment of the general public. First, the Travelers' plan presented to the public two alternative sources for future water supply needs—either the Connecticut River (the cheaper source) or several new reservoirs in the Farmington Valley (the more expensive). It was widely believed that the poor quality of Connecticut River water would assure an emotional rejection by the public of this alternative. Such an expectation might hold true for the population as a whole. It was clearly not the case among FRWA members (Table 9), who, by a margin of nearly 3 to 2, favored development of the Connecticut River to meet future supply needs.

The respondents' suggestions for improving local recreational areas appear in Table 10. Again, the large number of members (36 percent) failing to answer or to offer suggestions is disappointing. Of

those who did offer recommendations, the greater proportion cited pollution as the chief problem. This is somewhat curious since water quality is not one of the more critical problems in recreational development and may represent a "spillover" from other questions on the questionnaire. Only a few persons cited the need for improved facilities, better access, and maintaining water levels. This fact may suggest that for the membership as a whole experience with these particular problems has been very limited.

Another aspect of recreational development concerns the controversial recommendation by the Travelers' plan for the recreational uses of water supply reservoirs. FRWA members, asked their opinions of the desirability of both boating and swimming on reservoirs, produced the results recorded in Tables 11 and 12. The contrast in opinion is most interesting. The high proportion (68 percent) favoring boating uses would probably surpass the hopes of the most optimistic of recreation enthusiasts. Attitudes toward swimming, however, are not so uniformly favorable. For this variable, opinion was much more evenly divided, with 48 percent supporting the proposal and 42 percent opposing it. Moreover, the intensity of opposition (not gauged in this survey) would probably be a serious obstacle. As one swimming opponent expressed it: "I don't like to drink bathwater!" Or, as another introspective respondent admitted: "I'm opposed because the psychological factor is very difficult for me to overcome." The author would venture a hypothesis that among the population as a whole, public opinion would be even more opposed to this recommendation.

The survey concluded with a general open-end question as to what qualities making up the "character" of the Farmington Valley the respondent would like to see preserved. Table 13 indicates the results. The quality cited most frequently involves the preservation of rural landscape and life and may reflect a desire to preserve the valley in the form which the respondent originally encountered. Any such permanence will be increasingly difficult to retain in the face of population growth and the spread of urbanization out from the Hartford metropolitan area. Other than this variable, attitudes focussed rather evenly on open space, pure water surfaces, and natural beauty.

CONCLUSIONS

The foregoing analysis presents some preliminary findings concerning the characteristics and roles of two principal parties in water resource management and planning in the Farmington Valley: key governmental agencies and the Farmington River Watershed Association. Further computer analysis will unearth more detailed relationships among the variables suggested in this discussion. Subsequent findings will also concentrate on the comparable results for the 383 interviews taken among the general public. From this data analysis, it will be possible to relate the planning and managerial process in the Farmington Valley to the more general theoretical discussion of major political, organizational, and behavioral issues—to how men think about and how political systems utilize their natural resources.

NOTES

¹ For example, see Roscoe C. Martin *et al*, *River Basin Administration and the Delaware* (Syracuse: Syracuse University Press, 1960); Charles McKinley, *Uncle Sam in the Pacific Northwest* (Berkeley: University of California Press, 1952); William F. Leuchtenburg, *Flood Control Politics* (Cambridge: Harvard University Press, 1953); Roscoe C. Martin, *Water for New York* (Syracuse: Syracuse University Press, 1960); Dean E. Mann, *The Politics of Water in Arizona* (Tucson: University of Arizona Press, 1963); C. E. Kindsvater (ed.), *Organization and Methodology of River Basin Planning* (Atlanta: Water Resources Center, Georgia Institute of Technology, 1964).

² The most exhaustive analysis is the so-called "Hoover Report," United States Commission on the Reorganization of the Executive Branch, *A Report to the Congress* (Washington, D. C.: Government Printing Office, 1949). See also Mister Z, "The Case for a Department of Natural Resources," *Natural Resources Journal*, I (November, 1961), pp. 197-206.

³ For controversy over the nature of public interest, see Norman Wengert, "Resource Development and the Public Interest: A Challenge for Research," *Natural Resources Journal*, I (November, 1961), pp. 207-223. Allen V. Kneese, "Normative Problems in the Evaluation of Water Resources Development Projects," *Southwestern Social Science Quarterly*, XL (1960), 301-313; Arthur Maass, "Benefit-Cost Analysis: Its Relevance to Public Investment Decisions," in *Water Research*, edited by Allen V. Kneese and Stephen C. Smith (Washington, D. C.: Resources for the Future, 1966), pp. 311-328.

⁴ Members eventually completed and returned 340 of the questionnaires.

⁵ The Connecticut Development Commission, *Regional Planning Study: Farmington River Valley Region, 1955-1957* (Hartford: The Commission, 1957).

⁶ A useful study of interaction analysis can be found in Robert M. Bales, "A Set of Categories for the Analysis of Small Group Interaction," *American Sociological Review*, XV (1950), 257-263.

⁷ For a typology of political participation, see Lester W. Milbrath, *Political Participation* (Chicago: Rand McNally, 1965), p. 18.

⁸ Roger E. Kasperson, "Political Behavior and the Decision-Making Process in the Allocation of Water Resources Between Recreational and Municipal Use," p. 29 (Manuscript)

Table 1

Interagency Communication Patterns for the Massachusetts
Department of Public Health, Sanitary Engineering (1965)

Communications With	Patterns of Communication
Massachusetts Water Resources Commission	(a) written—at least once a month (b) telephone—numerous, at least daily (c) face-to-face—2 or 3 times a week
Massachusetts Department of Natural Resources	(a) written—seldom, perhaps not once a month (b) telephone—3 or 4 times a week (c) face-to-face—unofficial meetings once a week Subject areas—(1) wetlands, (2) marine fisheries, (3) inland fisheries
Massachusetts Department of Public Works, Division of Waterways	(a) written—nearly all contact in this form, 2 or 3 messages a week (b) telephone—almost never (c) face-to-face—none Subject areas—structural recommendations, licenses
Massachusetts Department of Agriculture	(a) written—rarely (b) telephone—1 or 2 messages a month (c) face-to-face—perhaps once a month Subject areas—chiefly irrigation
U. S. Department of Public Health (parent organization)	(a) written—official correspondence, 4 or 5 messages a week (b) telephone—1 or 2 messages a week (c) face-to-face—once a week
U. S. Geological Survey	(a) written—once a month (b) telephone—once a month (c) face-to-face—very seldom
Connecticut Water Resources Commission	(a) written—4 or 5 letters a year over special problems (b) telephone—very rare (c) face-to-face—once or twice a year at occa- sional hearings
U. S. Army Corps of Engineers	(a) written—2 or 3 messages a year (b) telephone—rare (c) face-to-face—rare Note: Most contact through the Massachusetts Water Resources Commission
New England Interstate Water Pollution Control Commission	(a) written—once a month (b) telephone—once a week (c) face-to-face—once a month Note: 4 official meetings per year

Table I (continued)

Communications with	Patterns of Communications
Farmington River Watershed Association	(a) written—once a year (b) telephone—none (c) face-to-face—none

Table 2
Composition of Membership in the Farmington River
Watershed Association (1965)
(as of June 11, 1965)

Category	Numbers
(1) Towns	9
(2) Industries	55
(3) Community and Private Organizations	39
(a) Garden clubs	(15)
(b) Fish and Game Clubs	(8)
(c) Schools	(6)
(d) Other clubs	(8)
(e) Private Foundations	(1)
(f) Planning Commissions	(1)
(4) Retail	8
(5) Private Individuals	598
Total	709

Table 3
Length of Residence in the Farmington Valley
by Members of the FRWA (1965)
(N 340)

Years Lived in Valley	Numbers
0 - 5.0	35
5.1 - 10.0	49
10.1 - 20.0	78
More than 20.0	155
Not in Valley or No Answer	23

Table 4
Means by Which Members First Heard about
the FRWA (1965)
(N 340)

Source	Numbers
Newspaper	50
Radio	5
Pamphlet	24
Member of FRWA	133
A Friend	72
Other	49
No answer	7

Table 5
Reasons given by Members for First
Joining the FRWA (1965)
(N 340)

Reason	Numbers
General Conservation Interest	141
Improvement and Protection of Valley	60
Natural beauty preservation	10
Protect water supply and quality	22
Develop recreation	18
Flood protection	11
Other	70
No answer	8

Table 6
Members Views of Services the FRWA Should
Perform Which It Does Not Now Do (1965)
(N 340)

Service	Numbers
Emphasize water quality	30
Prod agencies to action	33
Emphasize fish and wildlife	5
More recreational emphasis	9
Spur towns to action	12
More educational work	26
Miscellaneous	23
Satisfied with present program	70
No reply	132

Table 7
Involvement of FRWA Members in Other
Activities Concerned with Water Problems
(N 340)

1. Engaged in other activities	153
(a) Letter or telephone call to a public official	(37)
(b) Attended a public meeting	(43)
(c) Joined a conservation club	(35)
(d) Other	(38)
2. Did not engage in other activities	169
3. No answer	18

Table 8
FRWA Members' Opinions of the Farmington Plan (1965)
(N 340)

Strongly support it	20
Generally support it	89
Favor it with reservations	31
Oppose it	0
Consider it unrealistic	10
No opinion	46
No reply	144

Table 9
Preference of FRWA Members among Alternative Sources
For Future Water Supply Needs in the Farmington Valley (1965)
(N 340)

Source	Numbers
Connecticut River (less expensive)	144
New reservoirs in the Farmington Valley	100
Other sources	12
Both	31
Don't know or no preference	22
No reply	31

Table 10
FRWA Members' Suggestions for Improving Local Recreational Areas (1965)
(N 340)

Suggestion	Numbers
More pollution control	97
Provide more areas	54
Better facilities at areas	15

TABLE 10 (continued)

Suggestion	Numbers
Maintain water levels	18
Provide better access	14
Miscellaneous	21
No suggestions	13
No reply	108

Table 11

Attitudes to Boating on Public Water Supply Reservoirs
among FRWA Members (1965)
(N 340)

Should be allowed	111
Should be allowed with restrictions	120
Definitely should not be allowed	80
No opinion or undecided	9
No answer	20

Table 12

Attitudes to Swimming on Public Water Supply Reservoirs
among FRWA Members (1965)
(N 340)

Should be allowed	88
Should be allowed with restrictions	75
Definitely should not be allowed	142
No opinion or undecided	16
No answer	19

Table 13

Qualities of the Farmington Valley FRWA Members
Would Most Like to See Preserved (1965)
(N 340)

Quality	Numbers
Open-space or green areas	53
Rural landscape and life	78
Natural or pure water surfaces	60
Natural beauty and aesthetics	58
Other	26
Don't know	4
No response	61

APPENDIX

Department of Geology and Geography
The University of Connecticut
September 14, 1965

QUESTIONNAIRE TO MEMBERS OF THE FARMINGTON RIVER WATERSHED ASSOCIATION

In cooperation with the Farmington River Watershed Association, The University of Connecticut is conducting a study of the Farmington River Valley. The purpose of this questionnaire is to determine attitudes of members to water resource problems and development. Since names and addresses are not recorded, all responses will remain anonymous. The success of the study depends upon your willingness to complete and return the questionnaire in the postage-paid envelope enclosed. Thank you.

1. City or town of residence _____
2. How many years have you lived in the Farmington River Valley? _____
3. How many years have you been a member of the Farmington River Watershed Association? _____
4. Where did you first hear of the Farmington River Watershed Association?

<input type="checkbox"/> Newspaper	<input type="checkbox"/> Radio	<input type="checkbox"/> Pamphlet
<input type="checkbox"/> A member of FRWA	<input type="checkbox"/> A friend	<input type="checkbox"/> Other (Specify)
5. Why did you join the Farmington River Watershed Association?
6. In your opinion, what useful functions does the Farmington River Watershed Association perform?
7. In your opinion, what services should the Farmington River Watershed Association perform that it does not now do?
8. Were you flooded in the 1955 flood? ☐ Yes ☐ No
If no, was the property you now live on flooded in 1955? ☐ Yes ☐ No
9. Since the flood of 1955, do you feel that adequate protection has been provided in your area against future floods?
☐ Yes ☐ No ☐ Don't Know
10. If you participate in any of the following recreational activities in the Farmington Valley, please check the appropriate types:

<input type="checkbox"/> Swimming	<input type="checkbox"/> Boating	<input type="checkbox"/> Hiking
<input type="checkbox"/> Fishing	<input type="checkbox"/> Hunting	<input type="checkbox"/> Picnicking
11. For these activities, what could be done to improve local recreational areas?

QUESTIONNAIRE (continued)

12. Do you have any problems in your area with water pollution?

☐ Yes ☐ No ☐ Don't know

If yes, is the source of pollution

☐ Sewage? ☐ Industrial Pollution?
☐ Don't know ☐ Other (Specify)

13. What is the source of your water supply?

☐ Well ☐ Municipal ☐ Other

14. Rapid population growth in this area will put severe strains on present water supplies. Experts feel that there are two major alternatives:

(a) water from the Connecticut River—the cheapest source

(b) several new reservoirs in the Farmington Valley—more expensive

Which method would you prefer? _____

Why?

15. Have you heard of the plan for the Farmington Valley developed by Travelers Research Center?

☐ Yes ☐ No

If yes, how familiar would you say you are with the plan?

☐ Very familiar ☐ Familiar ☐ Slight knowledge ☐ No knowledge

What is your opinion of the plan?

16. In your opinion, should boating be allowed on a public water supply reservoir? ☐ Yes ☐ No
Why?

17. In your opinion, should swimming be allowed in a public water supply reservoir? ☐ Yes ☐ No
Why?

18. Who do you think should take the chief responsibility for developing water resources in the Farmington Valley?

☐ Federal Government ☐ State Government ☐ City of Hartford
☐ FRWA ☐ Local towns ☐ Other (Specify)

19. How should this future development be financed?

Questionnaire (continued)

20. Other than FRWA programs, have you ever engaged in any activities concerned with water problems?

☐ Yes ☐ No

If yes, indicate the type:

- ☐ Letters or telephone calls to public officials
- ☐ Attendance at public meetings
- ☐ Membership in conservation clubs
- ☐ Other (Specify) _____

21. What qualities making up the "character" of the Farmington Valley would you most like to see preserved?

22. What is your occupation? _____