AN EXPLORATION OF COMPONENTS AFFECTING AND LIMITING POLICYMAKING OPTIONS IN LOCAL WATER AGENCIES: PHASE II

by

Duane W. Hill and R. L. Meek

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Fort Collins, Colorado

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ABSTRACT

AN EXPLORATION OF COMPONENTS AFFECTING AND LIMITING POLICYMAKING OPTIONS IN LOCAL WATER AGENCIES: PHASE II

The perceptions, attitudes, orientations, and interaction patterns of water user publics are significant elements in local water systems. In an effort to locate at least one firm parameter of water systems, this research examines the attitudes, interaction, and other behavior of randomized samples of users of five local water agencies. Private and public agencies and rural and urban areas are included in the samples. The findings indicate that traditional, common sense classifications, such as private-public dichotomies or socio-economic classifications, have far less effect on public attitudes toward water agencies than do volume, type, and content of communication. Systematic differences, however, are present between urban and rural users. Rural users tend to exhibit somewhat more positive images of water management and higher levels of satisfaction than do urban users.

The data further indicate considerable, but not complete, independence of water systems from more general political systems. The linkages between systems are limited and occur only at selected points. Water system attitudes and behavior, however, are mutually associated in systematic and regular patterns across the samples. Communications about water with one's peers and the water management influence the water system strongly. The manner and form of influence or constraining effect may vary considerably, but a large amount of influence is consistently present. Generally, high peer discussion trafficks negative images of an agency, but images improve with each added increment of contact with management. Essentially, water systems have very low public visibility which impedes their capacity to sustain themselves.

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CHAPTER I

THE PROBLEM AND ITS SETTING

Introduction

The system through which water resources are developed, allocated, and utilized in the United States is being placed under extreme stress. A multiplicity of related factors have contributed to the development of the increased demands which are being placed upon the water resource system. Among these are: (1) increased demands for potable water for domestic use by a rapidly growing population; (2) substantial shifts in population concentrations including urbanization and migration to water-short areas of the Western United States; (3) expansions of industrial uses of water, particularly for the production of electric power; (4) intensification of irrigation practices in the agricultural sector; and (5) increased leisure time which has expanded the desire for the availability of water resources for recreational purposes. Concurrently, the available supply of usable water is being reduced by such factors as dangerous over-drafts on ground water reserves in a number of areas and significant increases in the problem of water pollution.[1] These pressures have resulted in an intensification in the search for technical alternatives which will increase the supply and quality of water including drastic changes in the physical location of water resources through inter-regional transfers, the development of means through which water

supplies can be more economically distributed and utilized in water-short areas, a renewed interest in water resource planning, and increased competition among different users and areas for available water supplies.[2]

The water management system is expected to respond effectively to this stress by developing and maintaining suitable supplies of high quality, low cost water and distributing it to the areas in which it is needed. The set of decision-making structures available for this task are highly complex, diffuse, fragmented, and frequently outdated. Nevertheless, these structures must adapt or be adapted to rapidly changing environmental conditions if adequate supplies of usable water are to be made available to meet pressing present and future needs. The necessary adaptations in structural forms and substantive policy are made most difficult as decision-makers find their alternatives and options restricted by a number of factors over which they have at best only limited control. These include: (1) a restrictive and sometimes archaic legal system; (2) deficiencies in available technological information; (3) severely limited financial resources; (4) administrative inertia; (5) fragmented communications systems; (6) limited public awareness and concern; (7) resistence to change by those with a vested interest in the current system of allocation; and (8) hostile public attitudes which generate non-support from the clients of agencies and the public-at-large. Each of these factors acts as a set of constraints upon the range of decisions that are feasible and viable for the individual agency and the system as a whole. All of these factors must be taken

into account in the design of effective plans and policies developed to resolve major water problems.

The most immediate and visable segment of the water resource system is the local water agency. These agencies are charged with the primary responsibility of providing adequate supplies of low cost, high quality water directly to users. Any shortages in the quantity or quality of water and any major increases in user costs tend to be construed as a failure of the relevant local agency. Attempts to increase the supply of high quality water in an area are generally effectuated through a local water agency. Therefore, these local agencies stand in a strategic position in the water resource system and policies and plans that fail to take their needs and problems into account have little chance of effectively meeting societal goals.[3]

The function of water delivery, in the American system, is carried out by thousands of local water agencies. These agencies exhibit very diverse patterns of service, administration, organization, resources, public accountability, rate structures, legal powers and jurisdiction, and integration into the larger water resource system. They also vary greatly as to the number and type of user served and as to the size of the geographic area to which they provide service. Generally, the policy-making options of these agencies are restricted by a number of external factors. These external constraints can be usefully categorized into three general types. These are: (1) the resources--technological, financial, human, organizational and natural--that are available; (2) the regulatory requirements and public policy positions of relevant

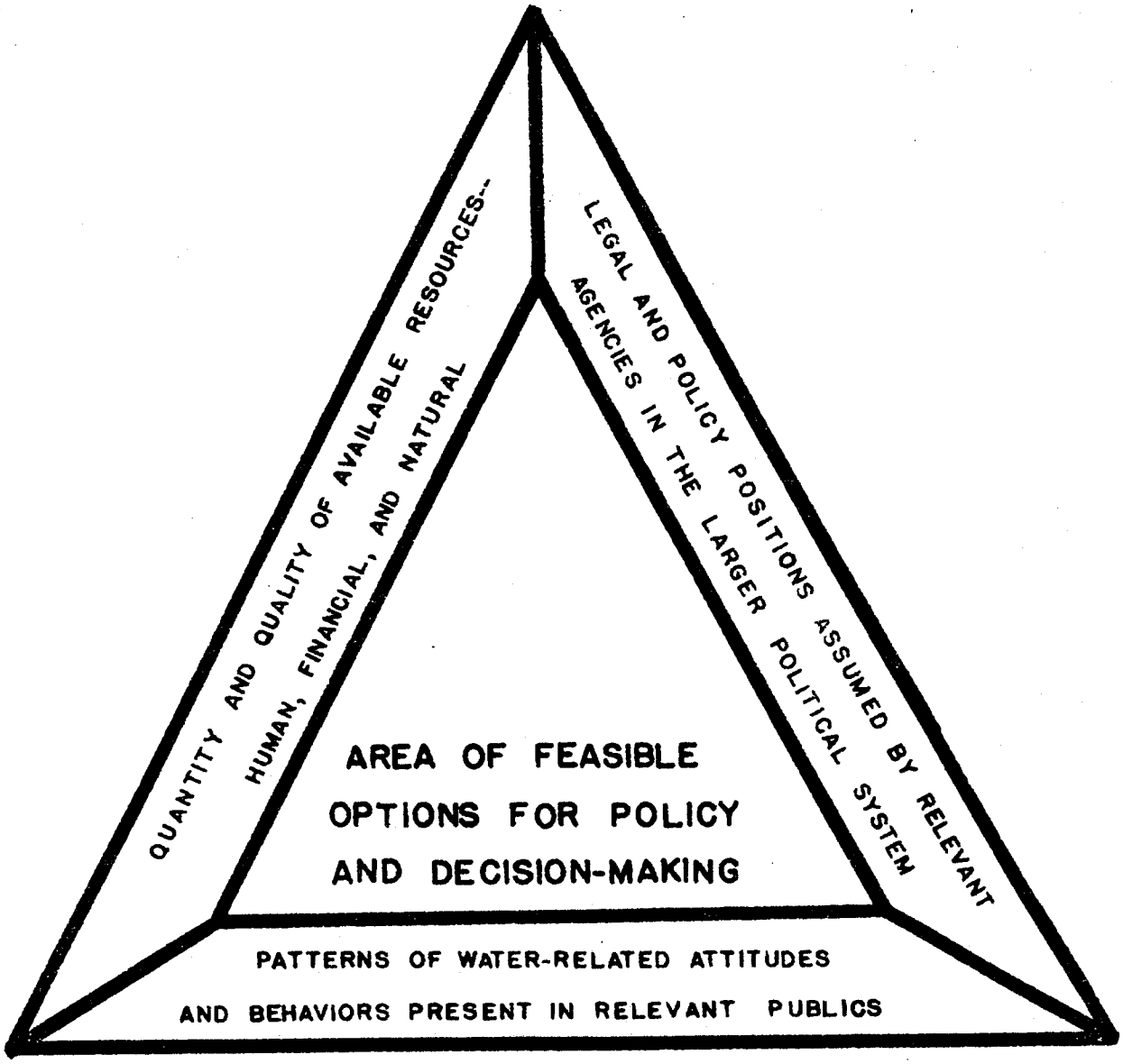
local, state, and national governmental agencies; and (3) the attitudes, behaviors, and patterns of support that are present in the relevant publics of the community that the agency serves and in the society as a whole. These constraints upon the decision-making behavior of local water agencies are presented in the form of a diagram in Figure 1, Page 5.

As depicted in Figure 1, the area of feasible options available to the local water agency is bounded by three types of constraints. Any policies or decisions made by the agency must take these constraints into account. The agency activities must be fitted within the range of tolerance provided by these constraints or the management must find ways and means to press back these constraints. If a policy is to be effective, the legal context and the public policies of relevant governmental agencies must authorize or at least must not deny the power to select the desired activity. Frequently, the activity is possible only if positive support by these agencies is available in the form of loans, grants, and/or technical assistance. Many activities which the local water management may perceive to be necessary may only be possible if changes can be made in the legal and policy positions of certain other public agencies. Likewise, any potential policy must be made within the limits of the resources that are or can be made available to the local agency. A condition of achieving organizational goals is frequently a search for new resources such as a new source of water supply, technological information, new management skills, or new sources of revenue or capital. Many otherwise preferred options must be discarded because

Figure 1

Policy-Making Options of Local Water Agencies:

Types of Constraints



of the unavailability of the necessary resources. This problem is intensified by the fragmentation of the water delivery system into a very large number of relatively small agencies with severely limited access to needed resources. Finally, the distribution of public attitudes and behaviors toward the agency form a barrier to the effective realization of organizational goals.

The array of options available to the agency is conditioned by the expectations and demands of relevant publics. The agency can only administer effectively those programs that are reasonably acceptable to clients and the community and frequently the viability of options is determined by the degree of positive support for them that is present in the effected publics. Options that require bond elections, substantial changes in rate structures, voluntary rationing, and expansions of service areas are major examples of policies that require broad positive support by the agency's public.

Focus of Study

This study examines the policy-making options of local domestic water agencies from the perspective of user attitudes, values, and behaviors. The analysis is based upon data collected from users of five separate local water agencies distributed throughout a rapidly urbanizing segment of the Eastern Slope of the Rocky Mountains in the water-short area of the Western United States. The data were collected through the administration of systematic interview schedules to randomized samples of users of each of the agencies selected. A total

of 1183 interviews were completed. The agencies selected for analysis were chosen to represent a broad range of typical circumstances of local water agencies. Among those considered are: (1) rural, urban, and transitional populations; (2) public and private agencies; (3) variations in size of service area; (4) variations in number of users; and (5) variations in organizational structures. The major demographic, political, and social characteristics of the service areas will be described in Chapter II of this study.

The major objective of this research is to characterize local water publics and their relevant social systems (identify public system parameters). A primary set of research goals designed to fulfill this major objective are: (1) to identify the distribution of water relevant attitudes and behaviors of water users in local water agencies; (2) to specify the content of these attitudes and the patterns of relevant behavior; and (3) to relate systematically these factors to the policy-making behavior of the local water agency. Major attention is given to those attitudes and patterns of behavior that may tend to restrict and/or broaden the policy-making options of the local water agencies. Conversely, the impact of the activities of the agencies on the development of attitudes and patterns of behavior will be measured. The measures utilized actually identify the perceptions of agency behavior held by users rather than being direct measures of such behavior. It is the perception of a phenomenon that is deemed most significant in the process of attitude formation and attendent behavioral changes rather than "real" behavior as judged by an external "objective" observer.[4] The patterns of interaction between user attitudes and perceived agency behavior represents the major research interest in this study. The hypothesized relationships

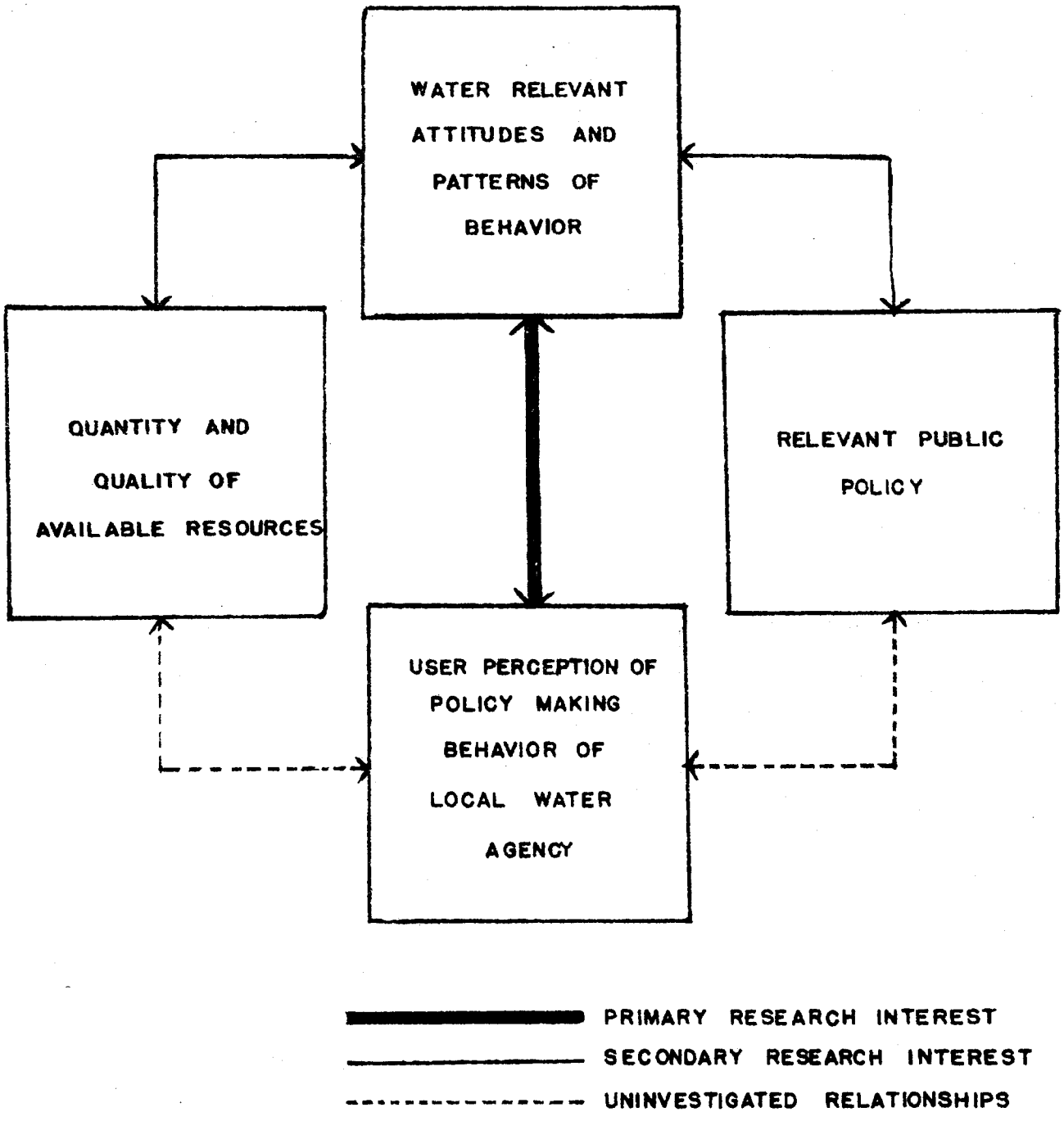
between policy-making behavior and external constraints are presented in schematic form in Figure 2, page 9.

A secondary set of research goals seeks to identify and specify the major configurations of attitudes toward significant issues of public policy in the field of water resources and the patterns of support for the development of different types of resources relevant to the needs that are present in local water agencies. These attitudes influence the ways in which the user relates himself to the local water management directly, and they indirectly condition the larger policy context within which agency decision-making must go forward. Changes that may be required in public policy to broaden or restructure the policy-making options of local agencies are significantly related to the attitudinal stances of relevant portions of the public. Therefore, the attitudes frequently operate as constraints upon the range of public policy decisions that are possible and these decisions often form the area of tolerance within which the activities of local agencies must operate. Attitudes toward the appropriateness, importance, and significance of different types of resources such as skilled management, expertise, training, re-use of water, and taxation also have a substantial impact upon the options available to the local water system. Thus, public attitudes serve as constraints not only on the agency directly but they also shape the nature and impact of other constraints upon decision-making. The direct effect of available resources and substantive public policy are important determinants of the activities of local agencies but the direct effects of these factors are beyond the scope of this study. These constraints are identified and examined only as they relate to agency behavior through the structure of water relevant

Figure 2

Patterns of Interactions Among

Constraints on Policy Making Options



attitudes and behaviors that are present in the public system.

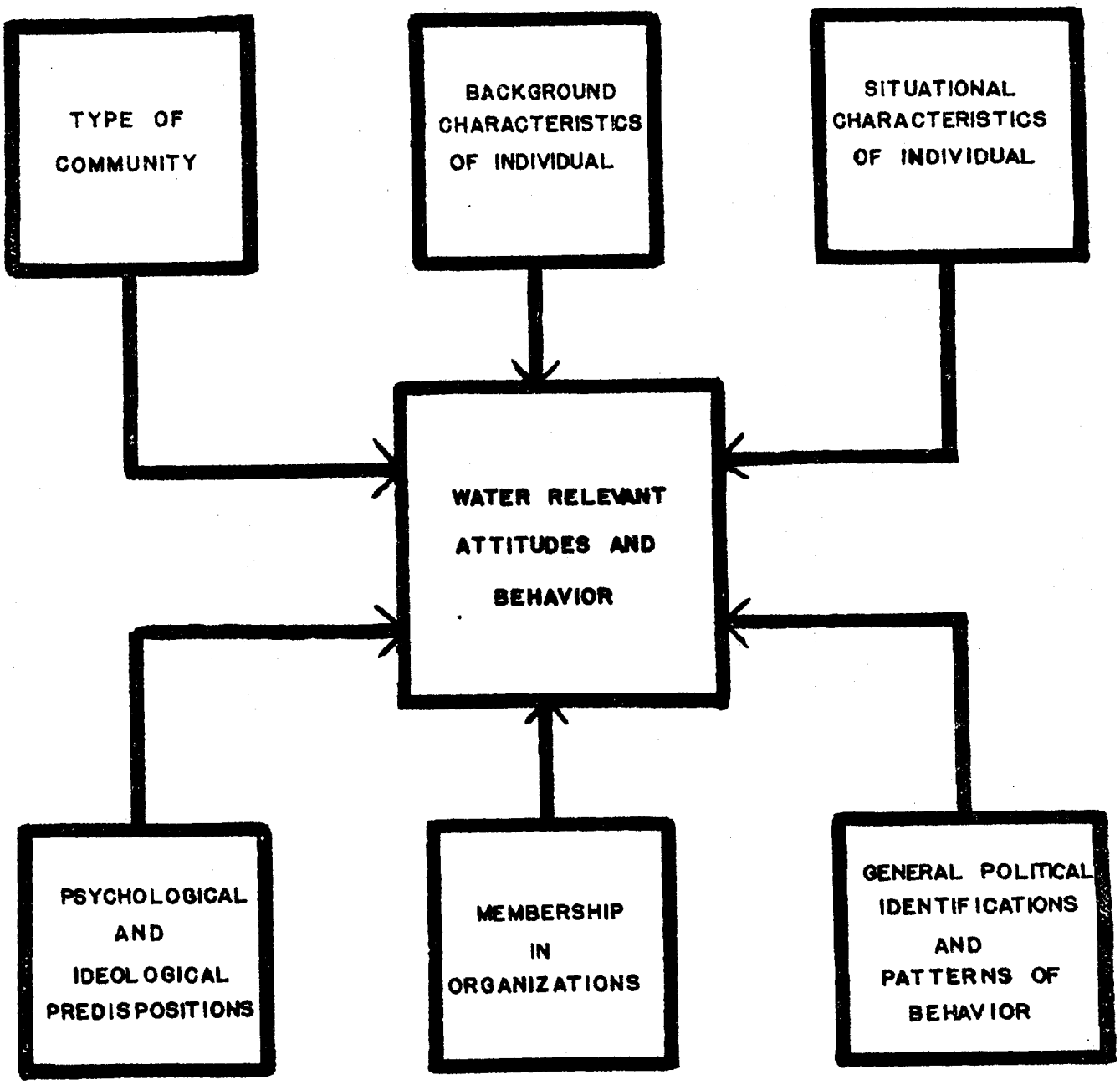
A third set of research goals pursues the measurement of the effect of general social, political, psychological, ideological, and situational factors upon the development of water relevant attitudes and behaviors. Two set of these factors are analyzed. These are: (1) a set of social background and situational characteristics, and (2) a set of ideological, psychological, and behavioral characteristics. The variables utilized and the hypothesized linkages among these variables are presented in schematic form in Figure 3, page 11. Likewise, a number of situational factors are examined as independent variables for their influence on the distribution and content of water related attitudes. These include: (1) the type of community, the intensity of community identification, and the individuals evaluation of the community; (2) the significant background characteristics of the individual including education, family background, and social and geographic mobility; and (3) socio-economic factors such as occupation, income, sex, and age. These factors are utilized to determine the impact of each of the individual characteristics and the effect of typical combinations of characteristics upon the development of water relevant attitudes and behaviors.

A fourth set of goals pertains to the research group's commitment to its sponsor to develop new measures and refine existing instruments for measuring public attitudes and behavior which can be used for specifying parameters of public water systems and measuring linkages among variables in such systems. Therefore, the patterns of interaction which link water relevant attitudes and behaviors to more general political, psychological attitudes and other forms of social behavior are also investigated. The primary concern here is with the explanation of the

Figure 3

Hypothesized Influences on the Development of

Water Relevant Attitudes and Behavior



impact that these general factors have upon the emergence of patterns of water relevant attitudes and the effect of these attitudes upon political behavior that is relevant to the decisional processes of local water agencies. Three separate sets of these general dimensions are analyzed. They are: (1) general ideological, political and psychological dimensions; (2) membership in organizations and identification with social grouping; and (3) political identifications, general patterns of political participation, and perceptions of the political process. Although water relevant attitudes and behaviors have an impact upon these dimensions, the primary emphasis is upon the effect of such dimensions as sociability, political cynicism, political efficacy, attitude toward change, activity measures, etc. upon water relevant attitudes and behavior. Specific designs, hypotheses, and tests of expected linkages within public systems are presented throughout the report.

Summary

The water resource system is coming under increasing stress, the reduction of which requires the development of effective plans and policies by water management. The local water agency stands in a strategic position in the water resource system and is, therefore, an object of critical concern. This study analyzes and characterizes public systems seeking to specify the water relevant elements within such systems, to determine how they are linked internally, and to suggest how they may shape the policy-making

options of local domestic water agencies.

CHAPTER II

THE COMMUNITIES

The primary purpose of this chapter is to develop a profile of the communities illustrating the more significant social, political, and economic characteristics of the users of the water agencies which are included in the samples. These data are drawn from the interviews with water agency customers which form the data base for this study. The profile developed serves as point of departure from which these general community characteristics can be related to the patterns of water related attitudes and behaviors which will be described in subsequent chapters.

All of the customers of the five domestic water agencies are included in the universe from which the samples were selected. The five agencies have service areas which are located in a rapidly urbanizing area on the Eastern Slope of the Rocky Mountains in Colorado and all are within the watershed of the South Platte River. The agencies, service areas, and users are generally representative of the diverse types of agencies and populations which are present in the region. Although five agencies are included in the study, the data were collected in four separate sample surveys and each of these will be used as an independent unit of analysis in this chapter. [1] A total of 1183 interviews were conducted. The samples were selected by using randomized sampling designs so as to assure that they would be representative of the populations from which they were drawn.

Each of the communities is defined by the boundaries of the relevant water service areas. These service areas do not fit neatly into the patterns of characteristics usually used in the definition of communities and they frequently cut across other community and legal jurisdictional boundaries. The only characteristic which links each together as a coherent unit is that the residents of each receive their domestic water supplies from a common source. Therefore, each community is actually a single purpose political system which is created by the interaction of the users and agencies around the problem of allocation of water resources for domestic consumption.[2] Each of the communities has been assigned a pseudonym which will be used throughout this study. These are Happy Valley, Rocky Ridge, Euphoria, and Farmland.

General Community Characteristics

Happy Valley. This community includes the service area of a rural water district which is located on the periphery of a rapidly growing small city of some 30,000 residents. The area has traditionally been rural in nature, but it has experienced substantial suburban development in recent years. At the time the sample was collected, a large majority of the residents were engaged in nonagricultural pursuits. The area is representative of many transitional communities in the region in which rapid change from rural to suburban patterns is taking place. The community contained slightly more than 700 households at the time the sample was drawn and persons from 132 of these households were interviewed.

Rocky Ridge. This community is a complex of three separate housing areas which receive their domestic water supply from a single municipal

water system. Service is provided by the only incorporated city among the three housing areas at the time the sample was selected. The entire area is located on the fringe of a major metropolitan area which provides most of the employment for the residents of the area. More than 10,000 households (of which over 7,500 were in an alien service area) were served by the municipal water agency at the time this sample was taken. A total of 429 interviews were conducted with water users in this area. Although the entire service area is treated as a single community for the purposes of the general descriptions included in this chapter, independent samples were drawn in each of the housing areas and they will be subjected to some independent analysis in subsequent chapters.

Euphoria. This community is made up of the persons within the service area of a large private mutual water company. At the time the sample was drawn, the area did not include any incorporated city and the primary local governmental services were provided by the government of the surrounding county. The community is located in the same metropolitan area of which Rocky Ridge is a part, and from which the water company receives its water supply. The area had a population of over 100,000 persons at the time the sample was drawn and 390 interviews were conducted with water users in this area.

Farmland. This sample is drawn from a combined community covering two contigious rural water service areas. The basic similarity of the social characteristics of the populations of these areas justifies treating them as a single community in this preliminary description. However, independent samples were taken in each of the service areas and the sub-samples will be subjected to independent analysis in subsequent chapters. Farmland covers a vast area of low population density

and is characterized by relatively large irrigated farms. The entire area contains some 300 square miles and the combined agencies provide domestic water service to approximately 1,200 households. One of the agencies is a private mutual water company and the other is a public water district. A total of 232 interviews were conducted with the water users in this area.

The analysis that follows describes the communities from the perspective of a number of social, political, and economic characteristics present in the communities. The identification of the distributions of these characteristics among the communities allows for the development of a profile of the communities that can be used as a base upon which subsequent analysis will be built. The characteristics that are described are those that have generally been found to be differentially related to significant patterns of political attitudes and behavior in studies of political behavior in the United States. A major concern of this study is to determine to what extent similar relationships can be identified between these variables and water relevant attitudes and patterns of behavior toward local water agencies and to evaluate the impact of these relationships upon the policy making options of these agencies as perceived by the users.

Social and Economic Characteristics

The first set of characteristics to be described constitute measures of the socio-economic status of the persons residing in the communities. The differential distribution of these characteristics between the communities are salient features for community classification. The dimensions used to classify the socio-economic configurations

are: age, education, income, and occupational class. These variables, individually and in combination, frequently are significantly related to political attitudes and patterns of political behavior. It is hypothesized that they may shape water related attitudes and behaviors.[3]

Age. The sample design limited the interviews to persons of 21 years and over. Therefore, the data describe the age distribution of adult populations rather than entire communities. The age distribution found in each of the samples is presented in Table 1. Rocky Ridge was verified as containing few persons between ages 21 and 30 and was found to contain a high incidence of women heads of households with small children. The paucity of youth in Farmland is a function of its rural character.

Table 1

Distribution of the Population
by Age and Community:
In Percentages

Community	Under 25	25-34	35-44	45-54	55-64	Over 65	Total*
Farmland	2.5	15.0	25.0	26.2	19.3	11.6	99.6 (N = 126)
Happy Valley	12.8	31.8	27.2	12.1	7.5	8.3	99.7 (N = 115)
Euphoria	8.8	18.7	25.3	23.7	11.4	11.7	99.6 (N = 383)
Rocky Ridge	1.4	8.3	42.0	34.9	10.2	3.0	99.8 (N = 421)

*Totals vary from 100% due to rounding and no answers are removed from the calculations

Significant variations in the age distributions of the communities emerge from the data. The residents of Happy Valley are significantly younger than those of the other communities. The average age of the Happy Valley sample is approximately 40 years and over 70% of the respondents were under 45 years of age. The mean age of the samples from the two suburban communities, Euphoria and Rocky Ridge, is around 45 years. However, the Euphoria sample shows a broader dispersion of persons in all age groups while the Rocky Ridge respondents are concentrated between the ages of 35 and 55 with more than 75% of the sample fitting this pattern. The Farmland sample is substantially older in average age than the other communities with an average age of almost 50 years and with almost 60% of the respondents over the age of 45 years.

Education. The levels of educational attainment are presented in Table 2.

Table 2

Distribution of the Population by Education and Community: In Percentages

Community	8th Grade	Some High School	High School	Some College	College Graduate	Other*	Total
Farmland	24.6	16.0	34.1	10.3	6.9	7.6	99.5 (N = 231)**
Happy Valley	12.1	9.0	34.8	18.1	9.8	15.8	99.6 (N = 132)
Euphoria	9.3	7.0	29.8	17.6	22.8	13.1	99.6 (N = 385)
Rocky Ridge	3.5	21.3	41.4	16.1	8.1	9.0	99.4 (N = 427)

*Includes Business and Trade School as well as specialized training beyond college.

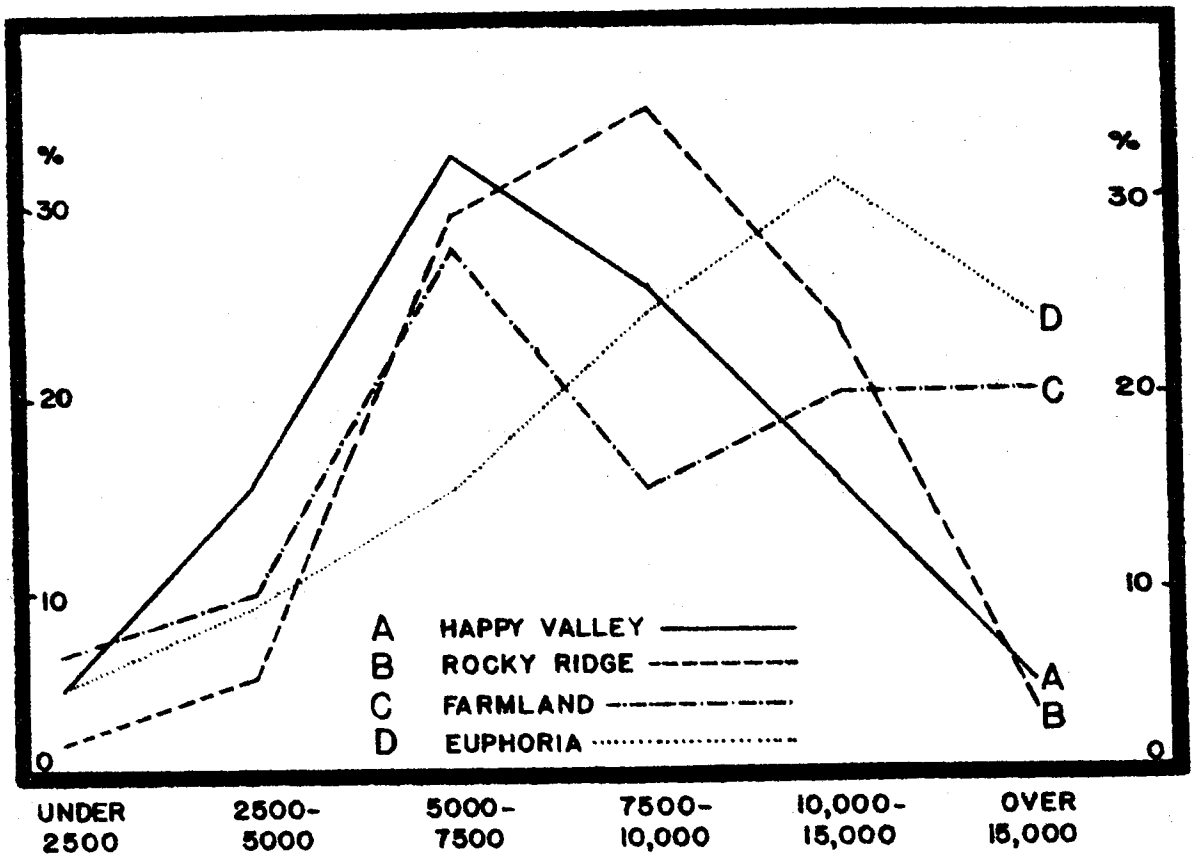
**Totals vary from 100% due to rounding and no answers are removed from the calculations.

These data indicate that there are a number of similarities and differences among the communities. The largest group of respondents in each of the samples are high school graduates. Farmland has the lowest level of educational attainment with almost 25% having completed only the eighth grade and nearly 75% having received a high school education or less. Rocky Ridge shows the second lowest level of educational attainment with almost 65% having a high school education or less. Almost 45% of the residents of Happy Valley have some education beyond high school. The respondents from Euphoria evidence a substantially higher level of educational attainment than the other communities. Almost 55% have had educational experiences beyond high school and nearly one-quarter are college graduates.

Income. The patterns of income in the communities are depicted in Figure 4, page 21. The respondents from Happy Valley have the lowest average income with the modal type having an income between $5000 and $7500. The Rocky Ridge sample has the next lowest average income with the largest group being in the $7500 to $10,000 category. The Farmland sample shows the most complex pattern of income distributions of any of the communities. The distribution is bi-modal in form with substantial proportions having relatively low incomes between $5000 and $7500 and with even a larger number having incomes of over $10,000 a year.[6] The highest average incomes are found in Euphoria with more than 50% of the sample reporting incomes of over $10,000.

Figure 4

Income Distribution by Community:
In Percentages



Occupational Class. The distribution of the respondents by occupational class is presented in Table 3. Housewives are classified here by the occupational status of the breadwinner of the family. Farmland is predominantly populated by farmers with nearly 70% of the respondents in this occupation. Rocky Ridge has a majority of its members in middle class pursuits with nearly an equal number of persons falling into the upper and lower occupational classes. Happy Valley has over 40% of its residents working in upper class professions and almost a quarter in

the middle class. It is the only community other than Farmland with any substantial number of farmers represented in the sample. Euphoria is the community with the largest proportion of residents in upper class occupations and the bulk of the remainder fall into middle class positions. Euphoria and Happy Valley are both upper to middle class communities and Rocky Ridge is predominately a middle class community. Farmland is a community in which agricultural occupations dominate the employment patterns.

Table 3

Distribution of the Population by Occupational Class and Community: In Percentages

Community	Upper Class	Middle Class	Lower Class	Farmers	Total
Farmland	12.3	5.9	12.3	69.2	99.7 (N = 218)*
Happy Valley	42.9	24.7	16.5	15.7	99.8 (N = 121)
Euphoria	49.2	35.1	14.6	1.0	99.9 (N = 390)
Rocky Ridge	25.1	51.9	22.2	.5	99.7 (N = 421)

*Totals vary from 100% due to rounding and no answers removed from the calculations.

The socio-economic characteristics of the communities in summary are: (1) Happy Valley is a transitional community which has come to be dominated by young upper class professionals which have relatively high education but who have not achieved high income levels. There is a residual component of farmers in the community reflecting the incomplete shift of the community from rural to suburban patterns.

(2) Rocky Ridge is composed of persons who tend to be concentrated in middle class occupations, have moderate levels of education, have lower to moderate incomes, and fall largely in the middle age category. (3) Euphoria is a community whose residents are concentrated in upper class professions and have higher incomes and higher levels of education than do users in the other communities. (4) Farmland is a community in which farming is the predominate occupation and whose residents tend to be of generally low educational attainment. The respondents from Farmland are, on the average, clearly older than those from the other communities. Substantial portions of the farmland respondents fall into both lower and upper income categories and the community evidences greater variations in income levels than do the other communities.

Community Identifications

The political behavior of individuals is shaped by the ways in which they relate themselves to the community in which they reside. The length of time they have lived in the community, the degree to which they find the community compatible with their background, and the degree to which they are satisfied with the community all have an impact on the ways in which they relate themselves to public questions of significance to the community. These factors may be shaped to some extent by their level of satisfaction with the water service; conversely, attitudes and patterns of behavior which are relevant to water management may be formed by these more general considerations. A number of relatively indirect indicators of satisfaction with the communities are used to

describe the similarities and differences among the communities in this basic profile.

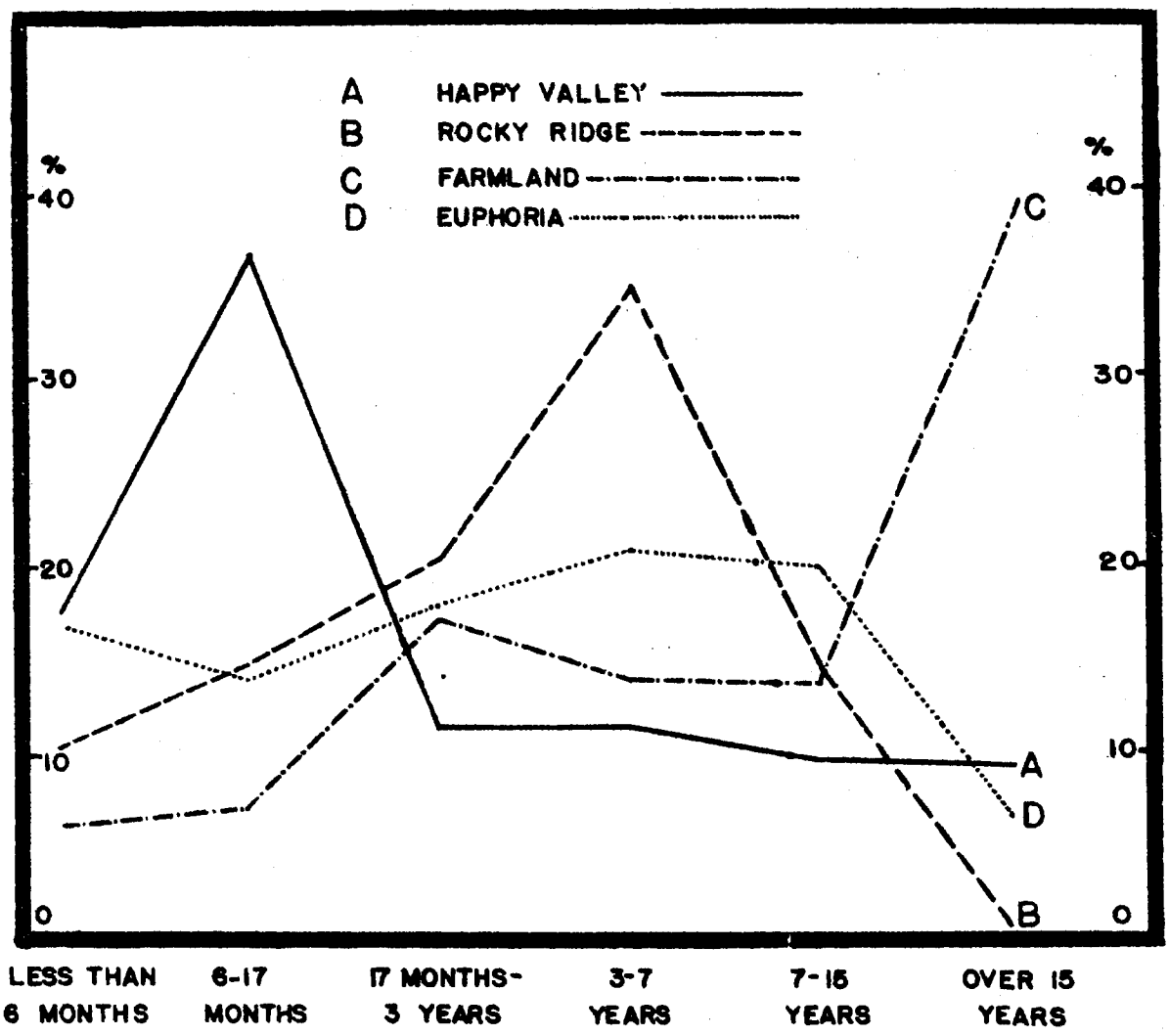
Length of Residence. The length of time a person has lived in a community influences his identification with that community, and likewise, the patterns of residence stability shape both the degree to which persons coalesce into a viable community and the extent and type of communications that are likely to develop. Happy Valley is generally marked by a very short period of average residence, with a majority having lived in the community for less than 18 months. Rocky Ridge evidences a pattern of residence which is more stable than that of Happy Valley. The majority of the respondents had lived in the community from 18 months to 7 years. Euphoria residents show the most diverse pattern of residence with substantial numbers of persons falling into all categories but with the largest numbers falling between 3 and 15 years. The most stable pattern of residence is found in Farmland with over 40% having lived in the community for more than 15 years. The distributions of the populations by length of residence are graphically depicted in Figure 5, page 25.

Community of Origin. The attitudinal structure and the life style of an individual is shaped by the immediate environment which he experiences during his period of maturation. The type of community in which the individual grew to maturity may influence the ways in which he relates to and interacts in the community of current residence. The Farmland sample shows a set of persons who have a quite common type of community as their place of origin. Over 80% of the respondents lived in small towns or rural areas during their formative

years. Similarly, the residents of Happy Valley most typically came from either small towns or rural areas. The bulk of the remainder list small cities as the place of early residence.

Figure 5

Length of Residence
of the Population by Community:
In Percentages



The two suburbs evidence a quite different pattern. The modal community of origin for the residents of Euphoria was the small city with the next larger number coming from large cities. Rocky Ridge

residents are the most divided, with the largest number indicating an origin in large cities and the next largest number coming from small towns and rural regions. The communities of origin of the sample populations tend to reflect the kind of community in which the persons presently reside. However, a disproportionate number of persons in all the communities spent their early years in small towns and rural areas. The patterns of distribution of the populations by place of origin are depicted in Figure 6, page 27.

Community Evaluations. Perhaps the most significant factor in the individual's identification with a community and its problems flows from his evaluation of the community as a place to live. The highest level of community satisfaction is found in Farmland, with nearly 70% of the respondents believing that it is an excellent community and only 1% feeling it is not a good place to live. Almost all of the Happy Valley residents feel that the community is an excellent or a fairly good place to live. The majority find it to be an excellent community.

The perceptions of the residents of Euphoria are very similar to those of Happy Valley. A slightly larger percentage find their community to be "excellent" and "not good" than was true for Happy Valley. The data from Rocky Ridge indicates a substantially lower level of community satisfaction than any of the other communities. The majority of residents find that it is only a fairly good community to live in, but a substantial number find it to be an excellent community; and again, only a very small percentage find it to be "not good." The patterns of community satisfaction are presented in Figure 7, page 28.

Figure 6

Community of Origin or
Population by Community:
In Percentages

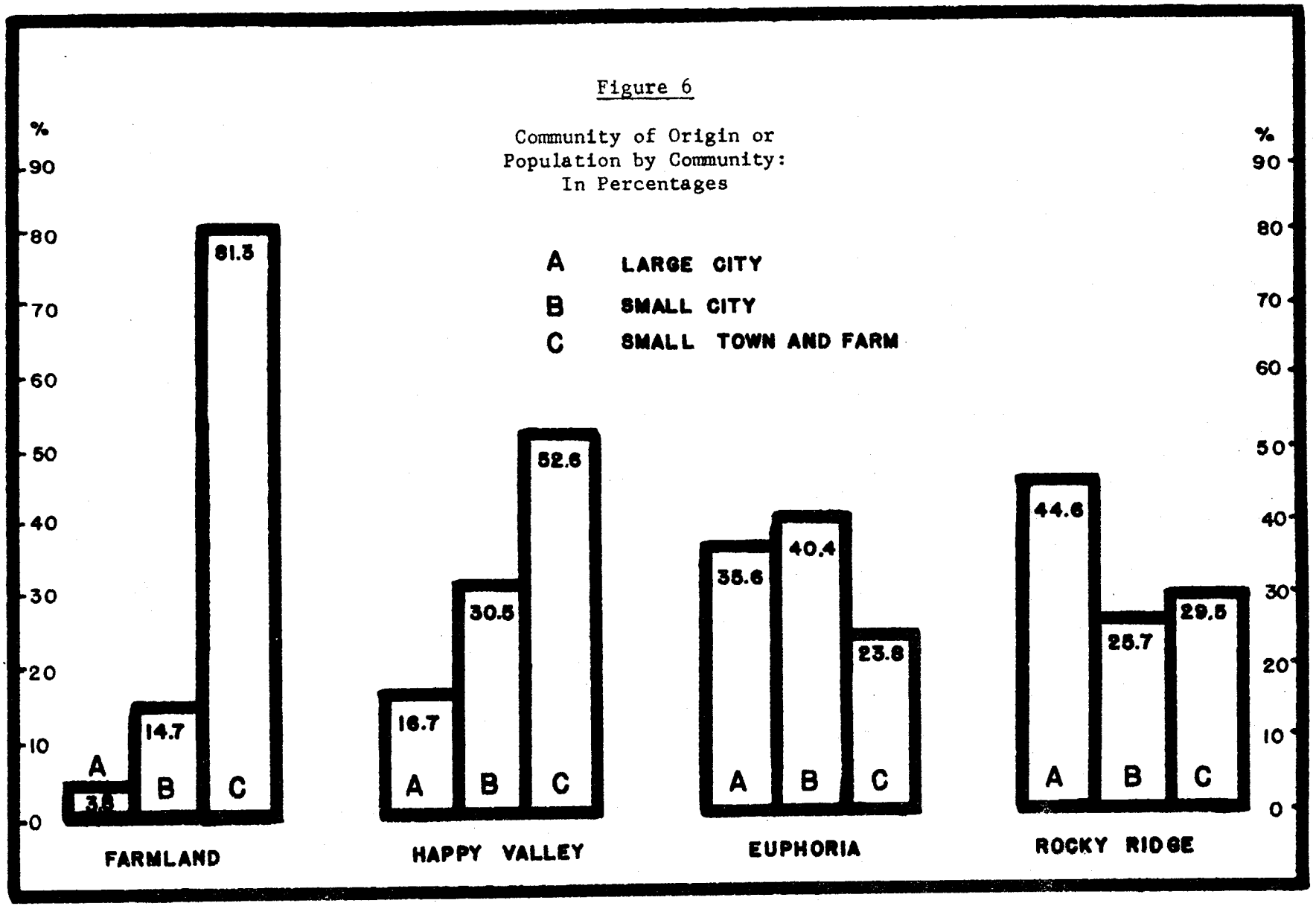
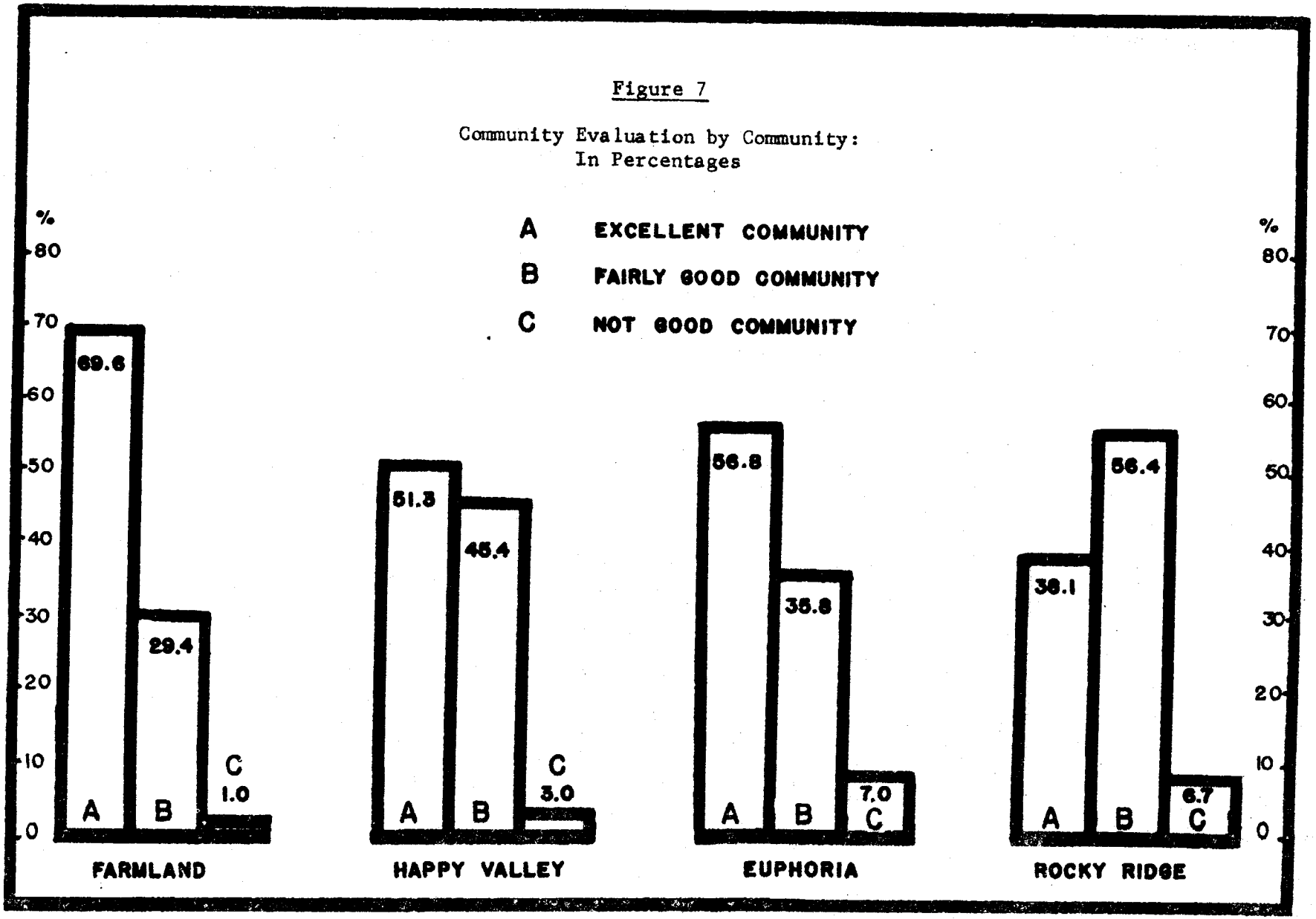


Figure 7

Community Evaluation by Community:
In Percentages



Political Characteristics

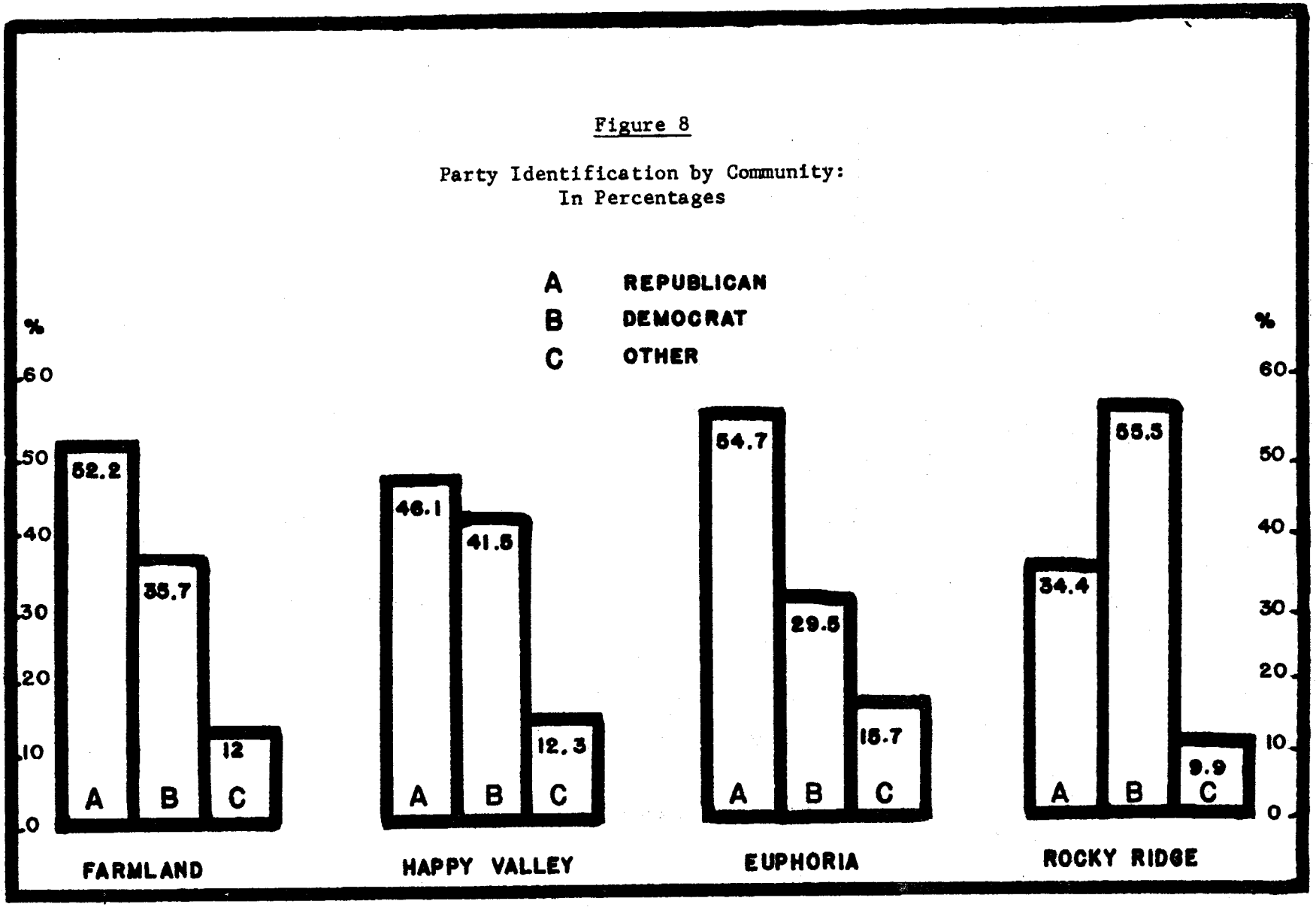
The patterns of political party identification, the orientations of individuals toward political affairs, and the level of interest in political questions are indicators of the ways in which the members of a community relate themselves to the political system.[5] These factors constitute some of the more significant forces which influence the patterns of political behavior in a community. The following analysis describes the distribution of some salient measures of political orientations and identifications that are found in the four communities.

Political Party Identification. One of the most significant factors influencing patterns of general political participation and the direction of political choices is the political party identifications of the persons that make up the community. This factor may also have a significant relationship to the patterns of behavior individuals develop vis-a-vis local water agencies. Two of the communities in the sample, Farmland and Euphoria, have a majority who identify with the Republican party. Euphoria has fewer Democrats and more Independents than does Farmland. Happy Valley is a community in which there is a virtual balance between the two major political parties. Rocky Ridge is the only community in the sample which has a majority of the residents reporting an identification with the Democratic party. These patterns of political party identifications are depicted in Figure 8, page 30.

Political Participation. One of the most salient issues in the study of political attitudes is the measurement of the propensity of the

Figure 8

Party Identification by Community:
In Percentages

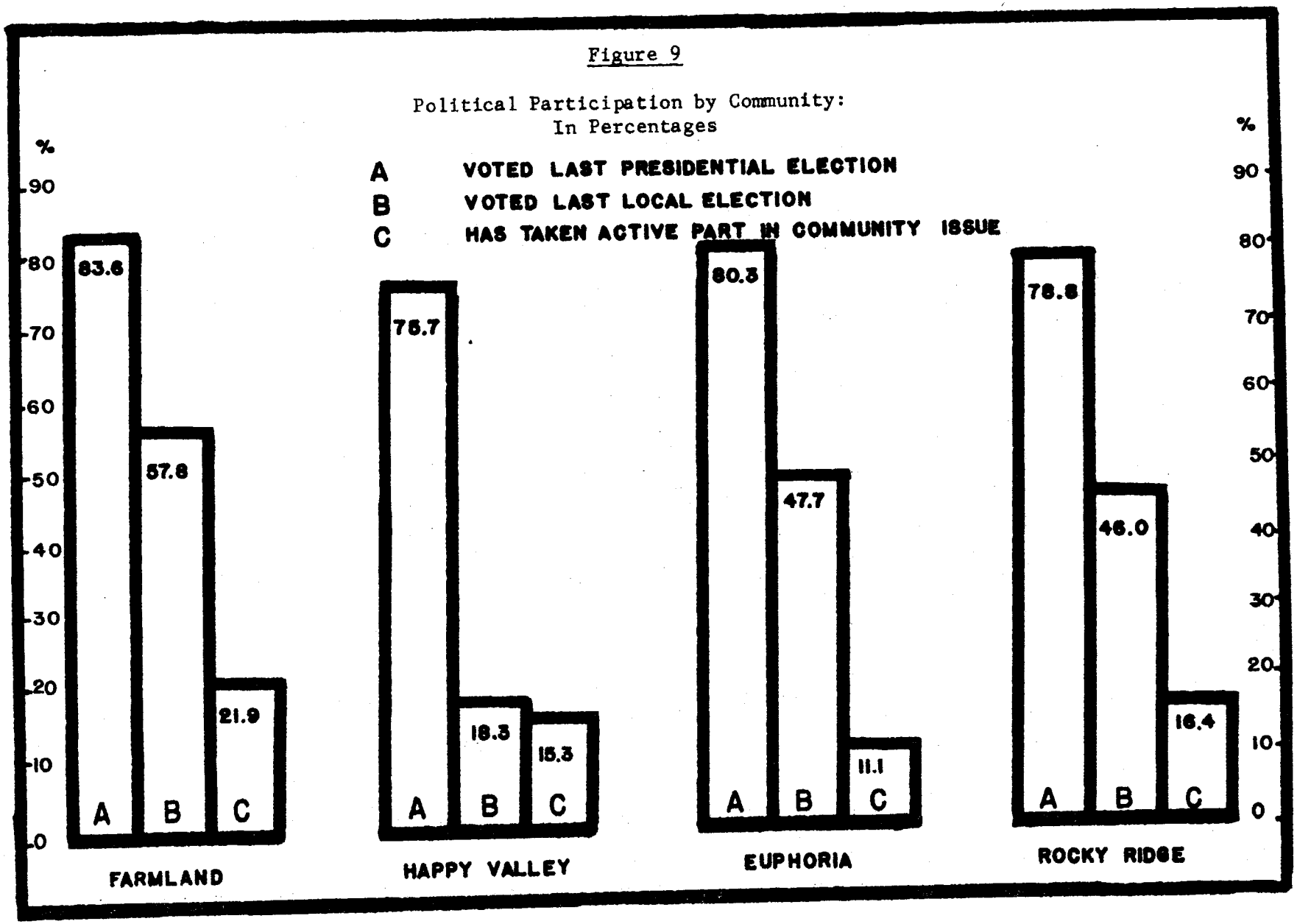


person to act politically in a manner that gives effect to the attitudes he holds. The voting record of the individual is an indicator of this relation. The voting records of persons in the four communities are presented in Figure 9, page 32. The data indicate that the residents of Farmland generally have the greatest propensity to vote and be active in political issues. A very high proportion of the Farmland sample report that they voted in the last national and local elections and a substantial number have taken an active role in some community issue. The residents of Euphoria show a similar high propensity to vote, but they are very unlikely to have taken part in a local community issue. The residents of Happy Valley and Rocky Ridge evidence very similar patterns of presidential voting and of participation in local issues, but the residents of Happy Valley show a much lower record of voting in local elections. All of the communities have a very high rate of reported voting in presidential elections. All of the communities except Happy Valley have moderate levels of voting in local elections, and all communities evidence a low propensity of the residents to assume active roles in community issues.

Interest in Politics. The level of interest that a person has in political affairs is an important indication of the level of political communication and political participation that will develop. The residents of all the communities evidence a moderate level of interest in politics. The highest level of political interest is found in Happy Valley with Farmland, Euphoria, and Rocky Ridge following in descending order. Three of the communities are marked by a significant pattern. In these communities, the residents report that they have greater interest in water matters than they do in general political questions. In each

Figure 9

Political Participation by Community:
In Percentages

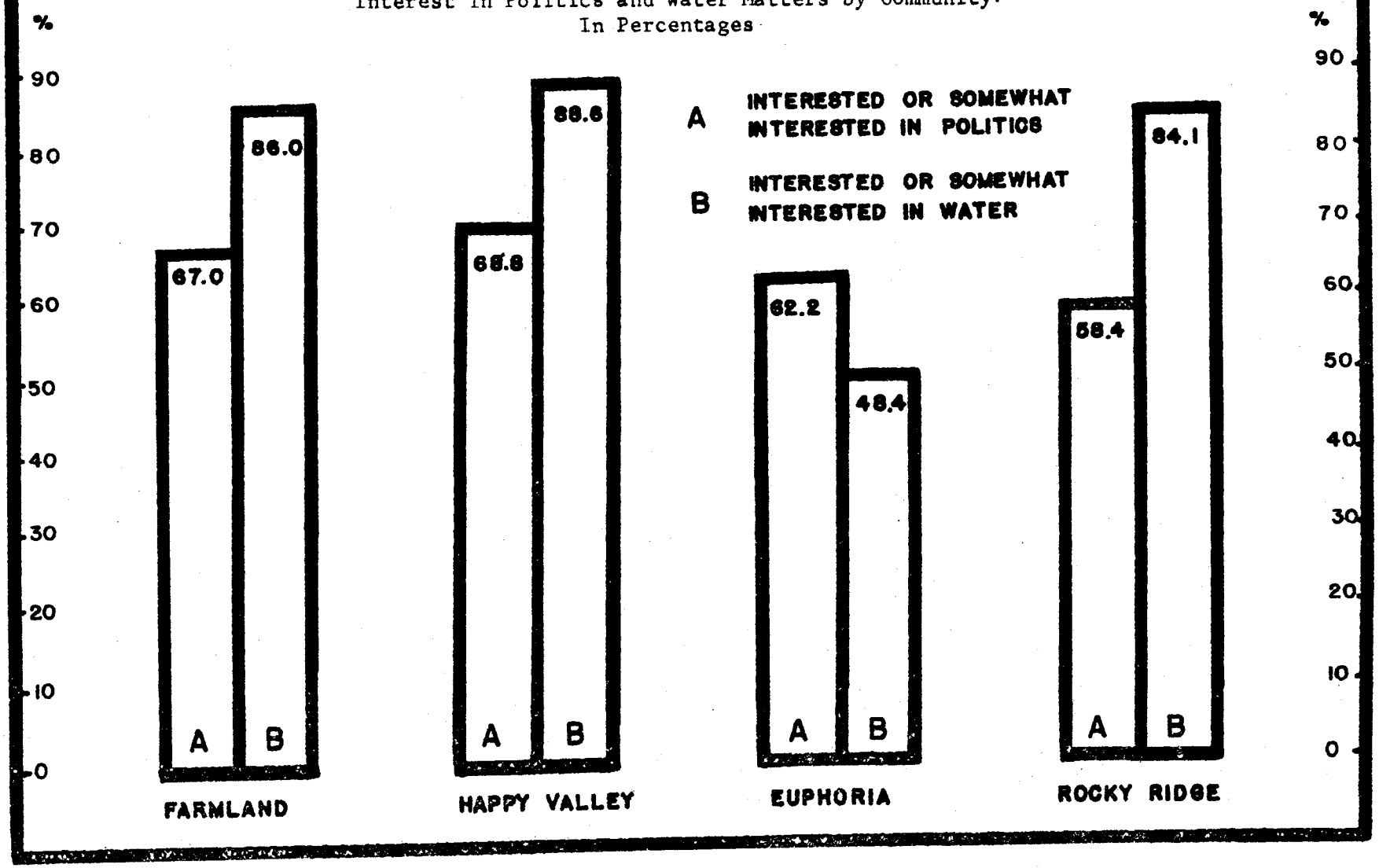


of these communities more than 80% of the residents report an interest in local water matters. Conversely, in Euphoria a majority of residents report a lack of interest in such matters. These data are presented in Figure 10, page 34.

The political characteristics of the communities in summary are: (1) Happy Valley exhibits a pattern in which there is a near balance between the two major political parties and a relatively high interest in politics and a high level of interest in water. The residents of the community exhibit the lowest propensity to vote in presidential and community elections and they evidence a low level of involvement in local community issues. (2) Farmland residents more frequently identify with the Republican rather than the Democratic party and they report a high level of interest in both politics and water issues. Of the communities considered, they evidenced the greatest propensity to vote and participate in politics at all levels. (3) Euphoria residents show a strong preference for the Republican party but a relatively low level of interest in politics and comparatively, a very low interest in water. They have a relatively high voting record in presidential elections, a moderate propensity to vote in local elections, and a very low involvement in community issues. (4) Rocky Ridge respondents tend to identify with the Democratic party and evidence a very low interest in politics but a high interest in water issues. They possess a relatively high voting record in presidential elections and moderate levels of involvement in the community.

Figure 10

Interest in Politics and Water Matters by Community:
In Percentages



Summary

This chapter characterizes the communities through the development of social, economic, and political profiles of the residents. In summary, the communities can be characterized as follows: (1) Happy Valley is a transitional community rapidly changing from a rural to suburban pattern. The residents are predominately young, well educated members of upper class professions with relatively low incomes. They are generally newcomers to the community having come from small towns and rural areas and are moderately satisfied with the community. They are moderately interested in politics and quite interested in water. They are nearly equally divided between the two major political parties and evidence a relatively high propensity to vote in presidential elections but a very low level of participation in community politics. (2) Farmland is a rural community populated by farmers. The residents tend to be older long time residents of the community with relatively low education and with substantial numbers falling into the low and the high income groups. They generally originated in rural communities and are very satisfied with their present community. They tend to identify with the Republican party and are quite interested in politics and water. They evidence the highest level of political participation of the communities studied. (3) Euphoria is a suburban community characterized by well educated, high income, middle-aged members of the upper professional class. The residents are distributed broadly in terms of length of residence, generally having originated in small or large cities, and are quite satisfied with the community in which they live. Politically, they are predominantly Republican, moderately interested in politics and

relatively uninterested in water matters. They are quite likely to participate in national elections but show a low propensity to participate in community affairs. (4) Rocky Ridge is a suburban community which is basically populated by young to middle aged high school graduates of a moderate income level who are concentrated in middle class occupational groups. The most frequent length of residence is from 3-7 years. More than any of the other communities, the residents cite large cities as a place of origin and are the least satisfied with there present community of residence of the communities studied. They generally identify with the Democratic party and express low interest in politics and a high concern for water matters. They show a moderate level of participation in electoral politics.

CHAPTER III

PUBLIC ATTITUDES AND LOCAL WATER AGENCIES

User attitudes toward the performance of the local water agency and toward policies that shape the performance of the agency operate as significant constraints upon the selection of policy options by the local agency and other relevant public agencies. The choice of policy-making options by agency officials must take relevant user attitudes, values, and perceptions into account if agency goals are to be effectively realized and if public support is to be maintained. A number of attitudes that are directly related to the evaluation of agency performance and selected policy options will be explicated in this chapter and these attitudes will be related to a number of socio-political dimensions throughout the remainder of this study.

The distribution of a number of water-related attitudes and perceptions within the communities covered by this study are presented. Four related categories of attitudes are examined. These are: (1) The general user perception of the significance of water matters. The primary measure that is utilized is the level of interest in water matters claimed by the respondents. (2) The general evaluation of the activities of the relevant water officials and agencies. The major concern is the distribution of positive and negative judgments as to how effectively the water officials are serving their users. (3) The general attitudes of users toward selected policy options that directly affect the operation of the local water agency. The measures include attitudes toward changes internal to the agency and changes in the relationships between the agency and its

political environment. (4) Attitudes toward selected water policies that are related to the availability of water in the region as a whole and are only indirectly related to the activities of the local water agency.

The distributions of water relevant attitudes are analyzed as they are related to different types of water agencies and in different types of communities. The data presented are divided into six samples as described in Chapter II, pages 15-17. Three of the communities, i.e., Happy Valley, Farmland I, and Farmland II are predominantly rural communities. Happy Valley is a transitional community that has been subject to substantial urban intrusion, but the community is served by a rural domestic water agency and is most appropriately categorized as a rural community for the analysis of attitudes toward agency performance. Happy Valley and Farmland I are served by rural domestic water districts which are organized as special districts with taxing powers and public responsibilities. Farmland II is served by a private mutual water company. All of the rural agencies were created in the last decade and have quite underdeveloped administrative structures.

Three of the communities, i.e., Rocky Ridge I, Rocky Ridge II, and Euphoria, are suburban areas. Rocky Ridge I and II are served by a municipal water agency which is a department of a municipal corporation. The residents of Rocky Ridge I live within the legal boundaries of the municipality while the residents of Rocky Ridge II live outside these boundaries and have no legal basis to participate in the decisions of the agency. Euphoria is served by a large private mutual water company with a highly developed administrative structure.

Samples were drawn from widely different types of communities served by different types of water agencies. Two communities are served

by rural water districts, two are served by a municipal water agency, and two are served by private mutual water companies. This distribution allows for the comparison of attitudes toward water agencies in a diverse set of communities and in relation to a number of types of water agencies. The significance of these dimensions will be evaluated in subsequent sections of this study.

Interest in Water Matters

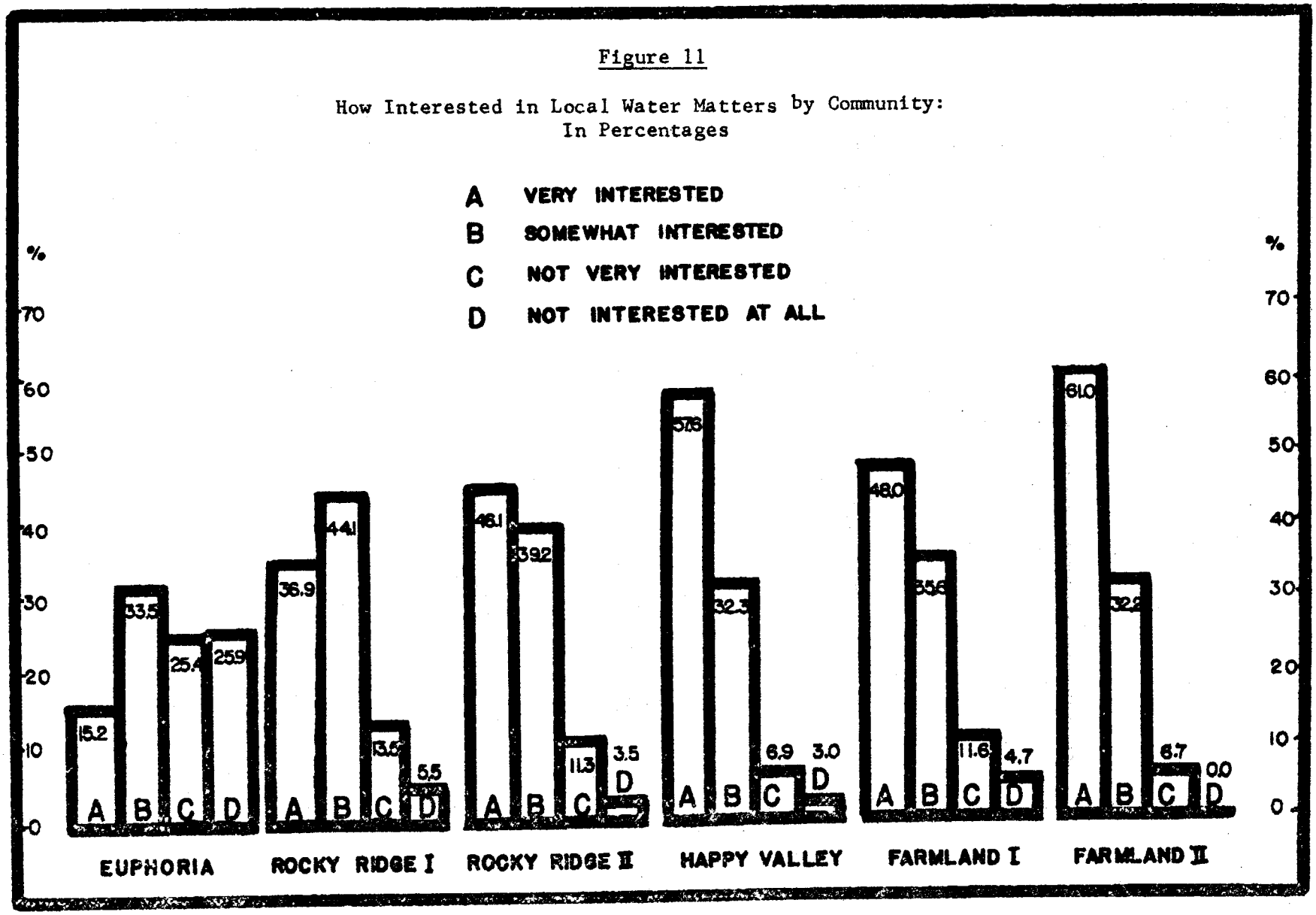
The data presented in Figure 11, page 40, indicate substantial interest in local water matters. The most intense interest is found in the rural communities. A majority of the respondents in Happy Valley and Farmland II claim to be very interested with roughly one-third indicating that they are somewhat interested. The residents of Farmland I show a slightly lower level of interest than is found in the other rural communities. The residents of Rocky Ridge II indicate the most intense interest in water matters of the urban communities examined. A somewhat lower level of interest is found in Rocky Ridge I. However, the data indicate that the residents of both these communities maintain a substantial interest in water matters. Euphoria is the only community in the sample that evidences very low interest in local water matters. A majority of the residents of the community report that they have little interest in water matters. Generally, the respondents in this study indicate substantial interest in water matters with rural communities showing stronger interest than the urban.

Evaluation of Agency and Official Performance

Agency Performance. One of the more significant evaluations of the performance of the agency is the perception by the users as to how

Figure 11

How Interested in Local Water Matters by Community:
In Percentages

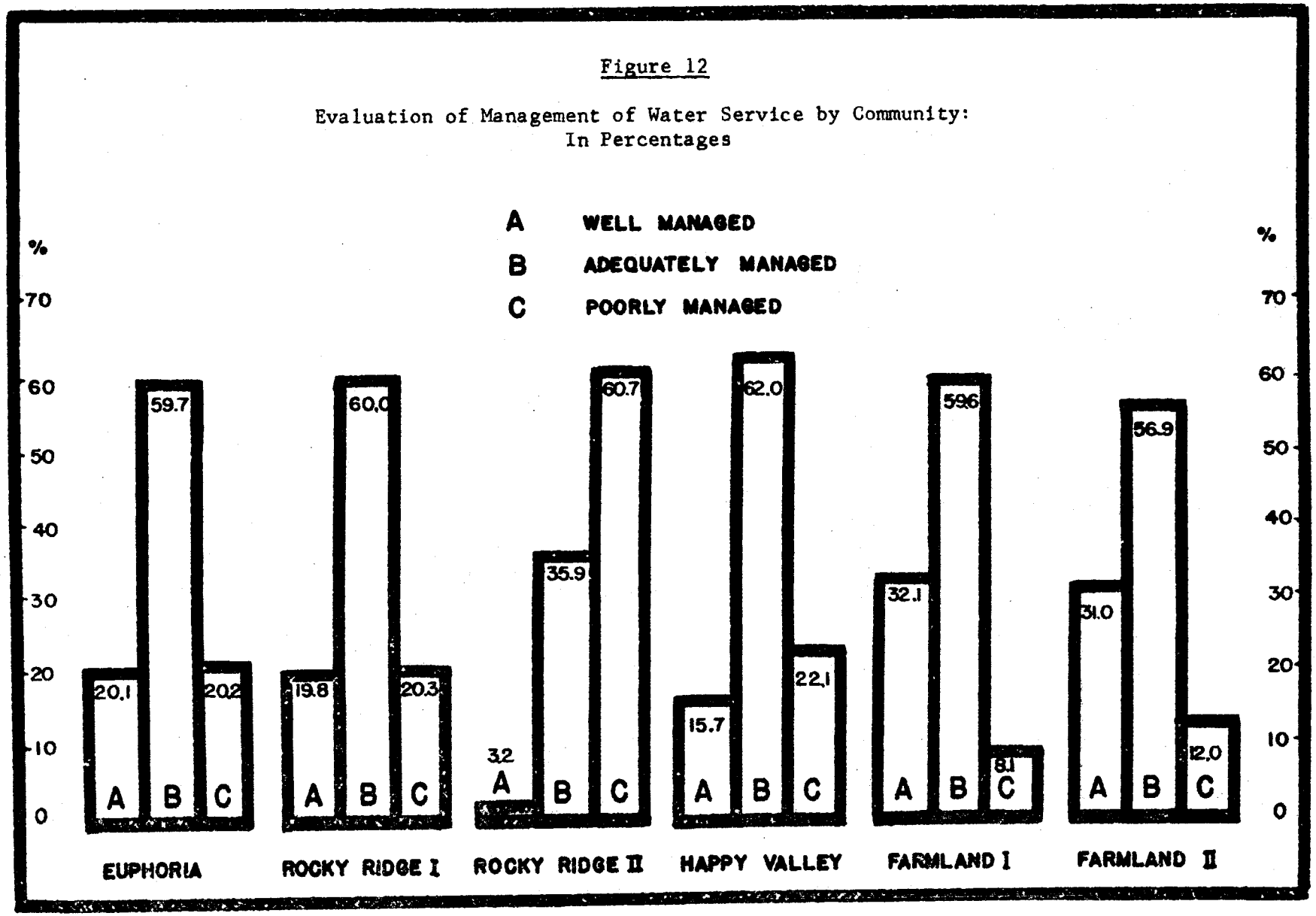


well the agency is managed. Generally, the data presented in Figure 12, page 42 indicate that the users of the agencies included in this study believe that their water agency is adequately managed. A majority of respondents in five of the six communities indicate that they believe that the agency is adequately managed. The highest evaluations are found in Farmland I and II in which nearly one-third of the respondents report that they believe that the agency is well managed and approximately 60 percent indicate that the agency is adequately managed. Relatively few persons in these communities feel that the agency is poorly managed. The other rural community, Happy Valley, evidences a somewhat different pattern of attitudes. Again, some 60 percent of the respondents indicate that the agency is adequately managed, but substantially more persons feel that it is poorly managed than well managed. The number of respondents reporting poor management in Happy Valley is substantially greater than in the other rural communities.

Two of the urban communities, Rocky Ridge I and Euphoria, evidence a similar pattern of attitudes to those found in the rural communities. Approximately 60 percent of the respondents in these two communities believe that relevant agency is adequately managed. In each community roughly one-fifth of the respondents believe that the agency is well managed and about one-fifth believe that it is poorly managed. The strongest negative view of management is found in Rocky Ridge II. Here approximately 60 percent of the users believe that the agency is poorly managed and only slightly more than one-third believe that it is adequately managed. This pattern may be a function of an agency whose service and control are alien to the community.

Figure 12

Evaluation of Management of Water Service by Community:
In Percentages

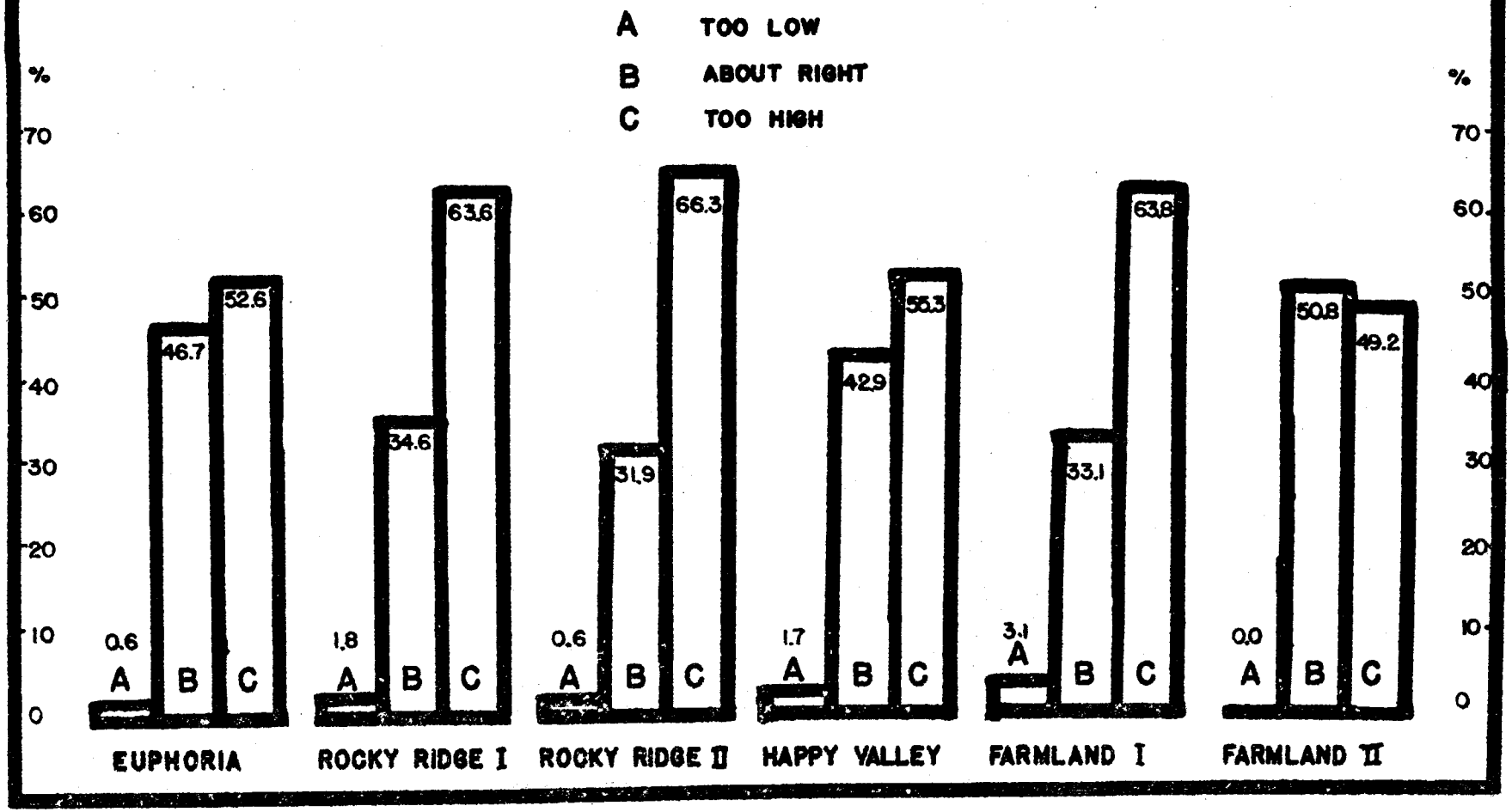


The data contain evidence of a consistent pattern of evaluation. Generally, the users of the agencies feel that the agencies are adequately managed. The only major departure from the pattern is found in Rocky Ridge II which is served by an agency outside the control of the users and the evaluation of the management by these users is very negative.

One of the significant measures of the evaluation of the service provided by the agency is the satisfaction with the rates charged by the agency. There is not a significant number of users in any of the communities that believe that the rates charged by the local water agency are too low. In all of the communities, except Farmland II, the majority of users indicate that they feel that the rates charged are too high. The data presented in Figure 13, page 44 indicate that approximately two-thirds of the users in Rocky Ridge I and II, and Farmland I indicate that the rates charged are too high. A slight majority of the users in Euphoria and Happy Valley believe that the rates are too high with over 40 percent indicating they believe the rates to be about right. In Farmland II a majority of the respondents indicate that the rates are about right with almost as many respondents indicating that their rates are too high. The data indicate a general dissatisfaction with the water rates found in the communities. There is little evidence of general public support for increasing water rates and there is some indication that there is at least potential pressure for the lowering of the costs of water service in all of the communities. There seems to be no substantial evidence of differences between the rural and the urban communities, but there is slight evidence of greater satisfaction with the rate structure of the private agencies than is the case with the public agencies.

Figure 13

How Do You Feel About Present Water Rates by Community:
In Percentages



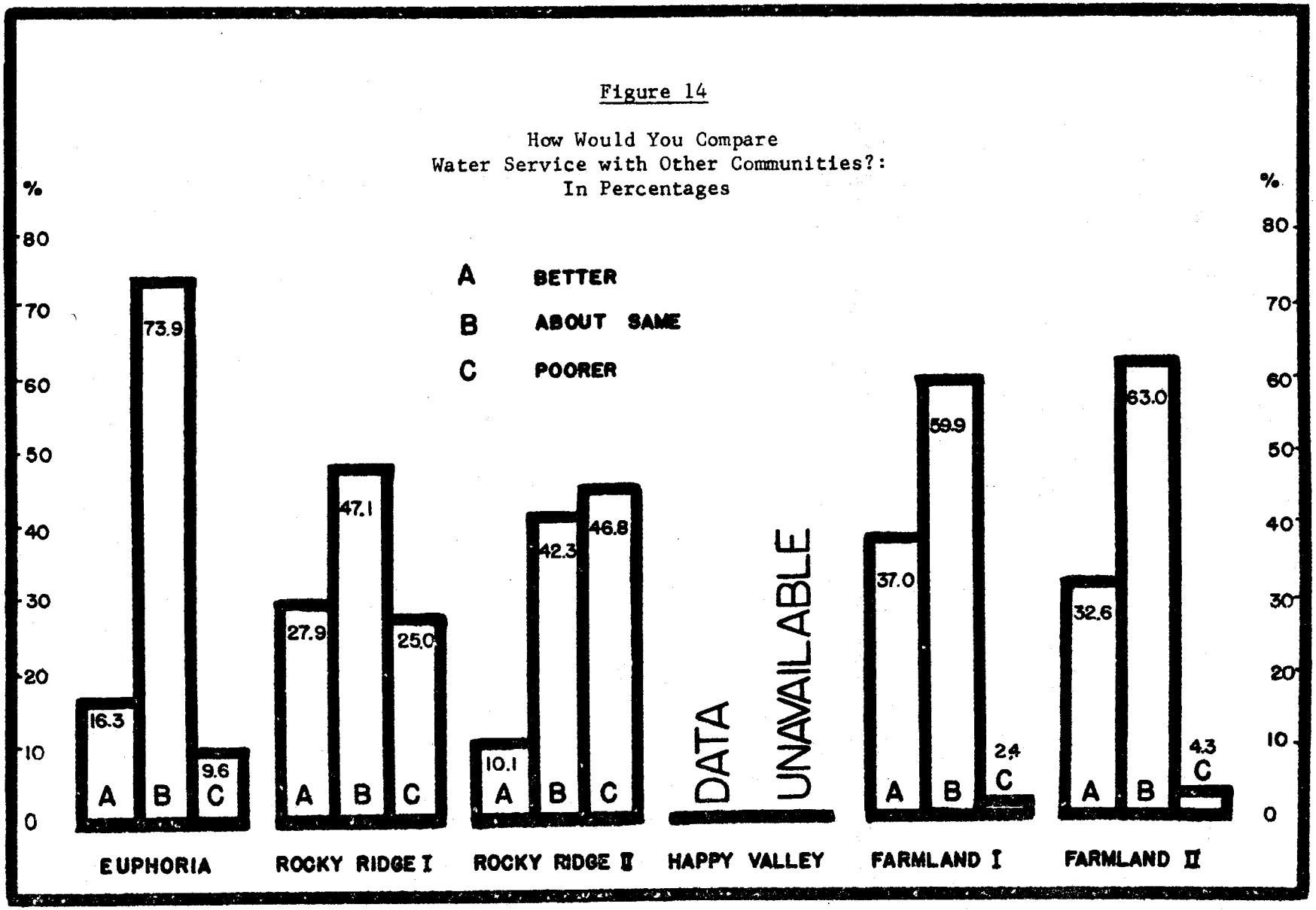
The final measure of agency performance to be presented relates to the evaluation of the users of the service of their water agency as compared with other communities. The users of three of the communities agree that their water service is about the same as other communities. These communities are Farmland I and II, and Euphoria. The two rural communities differ from Euphoria in that approximately one-third of the respondents indicate that their water service is better than other communities. A smaller percentage of Euphoria users evidence such a positive evaluation. Only an insignificant number of users in these three communities believe that their water service is worse than other communities. Therefore, the data indicate substantial user satisfaction with the water service.

The users in both Rocky Ridge samples indicate substantially less satisfaction with their water service. Fewer persons in these communities believe that their water service is about the same as other communities and greater numbers believe that is is poorer. The largest number of persons in Rocky Ridge II believe that their water service is worse than other communities. Proportionately more persons believe their water service to be better than other communities in Rocky Ridge I than in Rocky Ridge II. The data is presented in Figure 14, page 46. No data is available for Happy Valley.

Generally, the respondents in all of the communities feel that the agencies are adequately managed, the rates are too high, and the water service is similar to other communities. The greatest levels of dissatisfaction are found in Rocky Ridge samples with residents of Rocky Ridge II evidencing the most extreme dissatisfaction. The lowest intensity of feeling is found in Euphoria and the strongest support for the agencies appears to be present in Farmland I and II.

Figure 14

How Would You Compare
Water Service with Other Communities?:
In Percentages



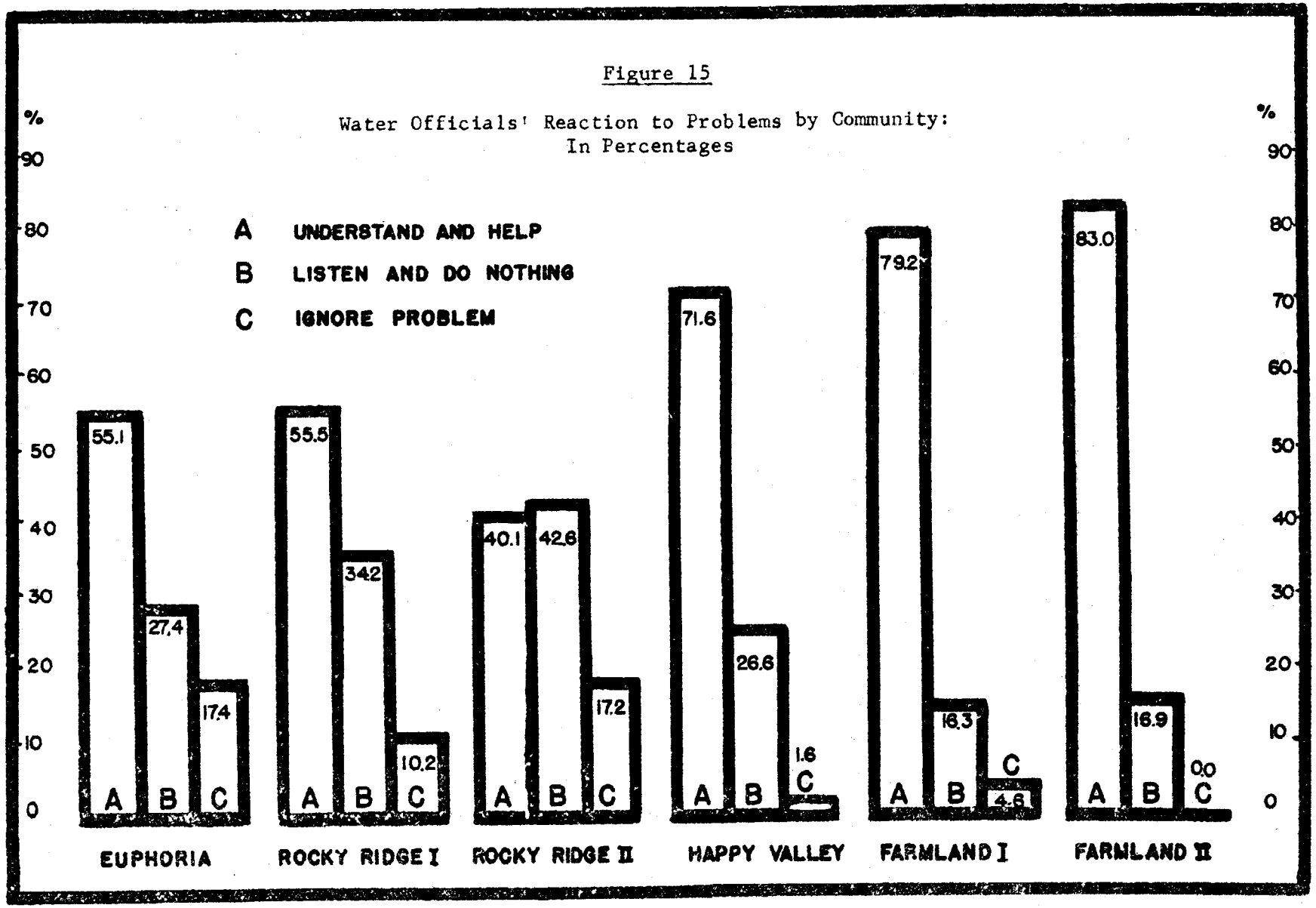
Evaluation of Water Officials. The evaluation of the general performance of the agency is related to, but not identical to, the evaluation of the activities of the officials of the agency. The present analysis is focussed upon the perception by users of the effectiveness of water officials in the performance of their official roles. The primary issue to be examined is the responsiveness of the water officials to the desires of the users and the public at large.

The data presented in Figure 15, page 48 identify the perceptions of the users as to the amount of sympathy water officials evidence toward user problems. The vast majority of persons in the three rural communities believe that the water officials would be sympathetic to their problems and would attempt to help solve these problems. An insignificant proportion of persons in these communities believe that the officials would simply ignore their problem. The data indicate that the bulk of the users of these three agencies perceive they are assured of a sympathetic hearing from water officials.

The three urban communities are marked by a lower level of confidence on the part of users that water officials would attempt to deal effectively with their problems. In two of the communities, Euphoria and Rocky Ridge I, a majority of users do expect such a sympathetic reaction to their problems. Only in Rocky Ridge II do we find that a majority of the users believe that the water officials would make no effort to solve their problems. Significant numbers in each of the urban communities believe that the officials would either do nothing or would ignore their problems. The data clearly indicate that residents of the rural communities have a much more positive evaluation of the level of concern of water officials than do the users in the urban communities.

Figure 15

Water Officials' Reaction to Problems by Community:
In Percentages



The perception of users as to the primary reference group of the water officials fall into a similar distribution. The data are presented in Figure 16, page 50. The largest number of persons in the three rural communities believe that the officials follow the direction of behavior preferred by the citizens at large. The broadest perception of agency response to citizen needs is found in Farmland II. The other two communities are more marked by a perception that the water officials react to the desires of either themselves or important persons in the community. The majority of the residents of Happy Valley indicate that they feel a lack of responsiveness to citizen needs.

The respondents from the urban communities are more likely to feel that the officials are unresponsive to citizen needs than are the users in the rural communities. The expectation of public responsiveness is most pronounced in Euphoria. The residents of both Rocky Ridge communities indicate that they do not find officials are responsive to citizen needs. The largest proportion of respondents from these two communities believe that the water officials are not responsive to anyone except themselves.

The data indicate that the bulk of persons in the rural communities see the water officials to be responsive to the needs of the citizen. Conversely, the respondents from urban communities are more likely to perceive that the water officials are unresponsive to their needs. The users of private agencies in both the rural and urban sectors are more likely to perceive responsiveness to citizen needs than are the users of public agencies.

The data presented in Table 4, page 51 contain evaluations of agency and official performance along a number of dimensions. The emphasis in

Figure 16

Direction of Behavior of Water Officials
by Community:
In Percentages

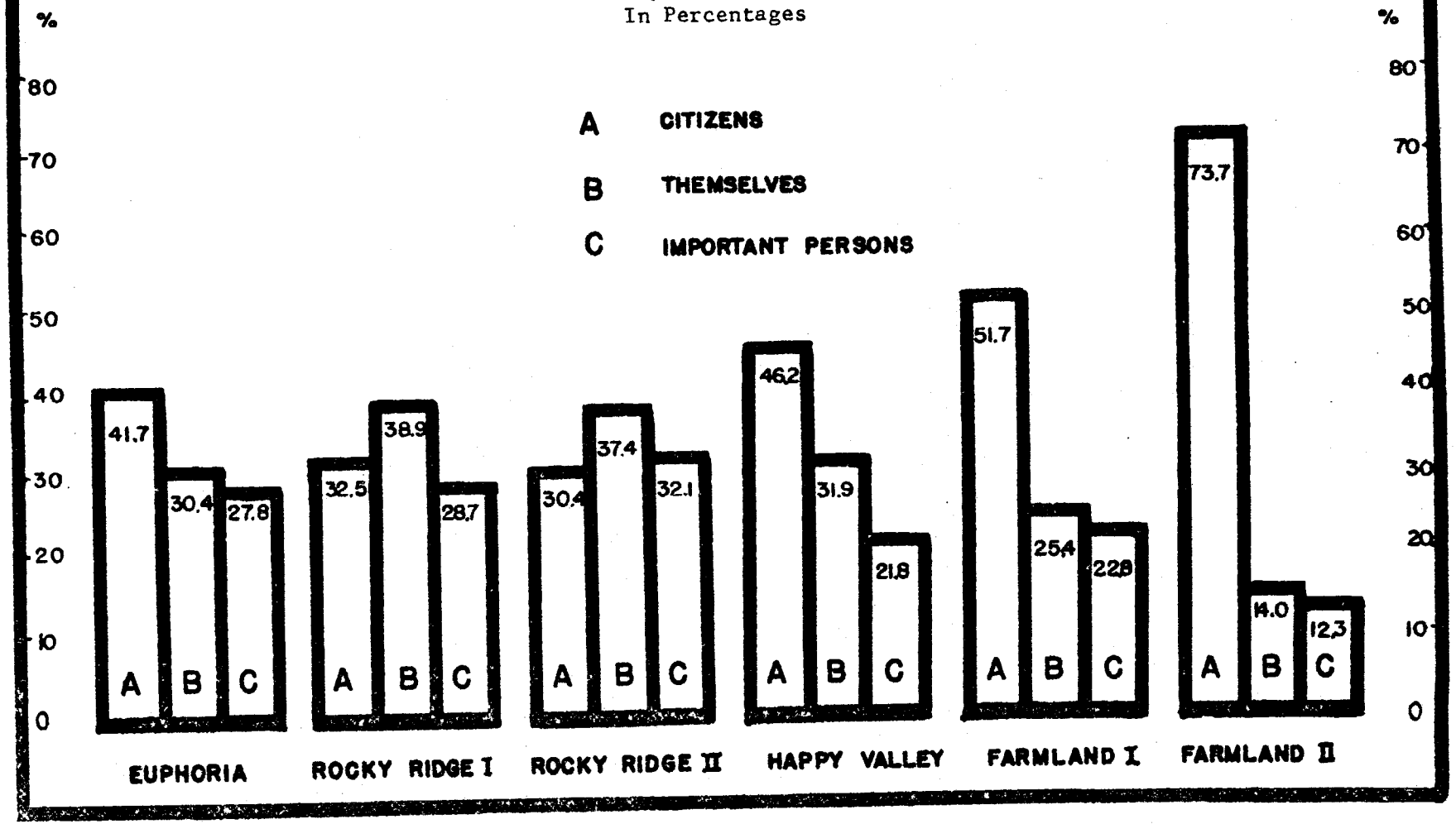


Table 4

Evaluation of Agency Performance
by Community

	PERCENTAGE OF POSITIVE RESPONSE					
	Euphoria	Rocky Ridge I	Rocky Ridge II	Happy Valley	Farm-land I	Farm-land II
People who use water are better able to decide about water than are water officials.	42.4	20.6	35.2	30.7	50.3	52.5
Water officials don't care how much I pay for water.	48.0	50.0	63.3	42.5	43.5	23.3
The Board pays a lot of attention to average water user.	56.2	60.4	46.7	61.4	71.8	78.9
The way water decisions are made can be described as a democratic process.	67.2	65.4	45.5	73.6	75.9	88.2
The way that water decisions are made is fair and equitable.	66.0	59.5	34.7	72.6	79.9	81.0
The ideas on which this water service was established are outmoded and should be changed.	42.0	50.5	62.0	26.7	29.9	28.9
There are many water officials doing a lousy job and should be replaced.	43.5	59.6	62.9	36.5	48.0	44.3

this data is the responsiveness of the agency and agency officials to the needs of the users. The data indicate a general positive evaluation of both the agencies and the water officials.

There is relatively general support for the superior ability of water officials to decide about water matters. Only in the two clearly rural samples do a majority of respondents believe that they are better able to make such decisions than are the water officials. In these two communities only a slight majority take this position. The respondents from the Rocky Ridge samples, who are most dissatisfied with their water system, clearly indicate that they are not better able to make decisions than are the water officials.

A majority of the respondents in all of the water service areas, except Rocky Ridge, believe that water officials do care how much they pay for water services. Generally, the rural users believe more strongly that their water officials are concerned about costs than do the users in the urban areas. The strongest feelings of lack of concern are found in Rocky Ridge II.

A majority of respondents in all of the communities, except Rocky Ridge II, believe that the board members pay a lot of attention to the water users. The respondents from the rural communities more frequently agree with this proposition. The respondents from Rocky Ridge II have a negative view of the responsiveness of their water officials. Similarly, the majority of respondents in all of the communities, except Rocky Ridge II, believe that the way that water decisions are made is democratic and is fair and equitable. The respondents from Rocky Ridge II indicate a very different pattern from the other communities. They believe that the water officials are unresponsive

to the users, that the process through which decisions are reached is undemocratic and is not fair and equitable. The positive evaluations of the respondents from rural areas is substantially broader on all of these dimensions than those found in the urban areas.

The majority of respondents in all of the water service areas, except Rocky Ridge, reject the proposition that the ideas upon which the water service area was established are outmoded and should be changed. The strongest rejection of this proposition is found in the rural areas. The general dissatisfaction of the Rocky Ridge user is again reflected in this dimension with the strongest negative view being taken by the residents of Rocky Ridge II.

Although there is substantial support for the proposition that many water officials are doing a lousy job and should be replaced, in all of the communities, only in Rocky Ridge is there a majority who take this position. There is no clear pattern of variation between the rural and urban communities in regard to this proposition.

The data indicate in general that there is greater satisfaction with water officials and their responsiveness to user needs and desires in the rural communities. Urban users are generally less convinced of the responsiveness of water officials and are less satisfied with their water service agency. The users from Rocky Ridge II show by far the most negative orientation toward water officials and the activities of the water agency. Private agencies have somewhat stronger public support than public agencies.

Attitudes Toward Alternative Policies

Organizational alternative. The attitudes of the users toward a

number of alternative means of dealing with problems of the local water agencies are presented in Table 5, page 55. The extent of agreement by the users with each of the alternatives is presented. These alternatives deal with changes internal to the agency, external control of the agency, and alternative means of increasing the funding of the agency.

The users were asked if they would support either the increase of personnel in the water office or the increase in the salaries of the water officials. A majority of the respondents in five of the six communities indicate that they would not support the increase of personnel in the water office. Happy Valley is the only exception to this pattern. There are no significant differences between the attitudes of respondents from urban and rural areas. However, the margin in all of the communities between those that would support and those that would reject such an alternative is relatively small.

There is considerably more support for an increase in the salaries of the water officials. A majority of the users of five of the six communities agree that salaries should be increased. Only the residents of Rocky Ridge II do not fit into this pattern. The strongest support for this alternative is found in the rural communities. The users of rural agencies evidence substantially greater support for increasing water official salaries than do the users of the urban agencies.

The respondents in all of the communities indicate agreement that there should be a state law to keep rates from getting too high. The strongest support for this alternative is found in Rocky Ridge II. There is no significant difference between rural and urban support for this alternative. The users of private agencies show slightly less support for state regulation than is shown by the users of public agencies.

Table 5

Support for Agency Related Policy Options
by Community:
In Percentages

	Euphoria	Rocky Ridge I	Rocky Ridge II	Happy Valley	Farm-land I	Farm-land II
Increase the number of personnel in water office.	48.6	43.9	43.7	57.6	47.2	43.9
Increase salaries of water officials	50.6	56.1	48.6	62.3	58.1	67.8
A state law to keep water rates from getting too high.	68.0	76.9	85.9	71.2	79.0	70.0
Regulation of local water administration by federal government.	42.0	37.2	42.9	23.4	23.2	27.1
Increase water rates to pay off indebted-ness.	42.0	27.0	22.6	37.4	46.7	62.7
Imposing a mill levy to pay off indebted-ness.	51.4	47.7	46.4	43.9	50.6	30.0
Federal government help with water indeb-tedness.	46.5	48.6	47.6	49.2	54.4	57.6

There is significantly less support for federal regulation of the local agency than is present for state regulation. A majority of the respondents from all of the communities reject this alternative. There is substantially lower support for federal regulation in the rural communities than is present in the urban communities. There is relatively little variation within either the urban or rural community groupings but there is a substantial difference between urban and rural types.

One of the problems that is faced by all of the agencies is the means of paying off the indebtedness of the agency. Three alternatives were presented to the users, i.e., an increase in rates, an increase in taxes, or federal aid. In five of the six communities the raising of rates was the least preferred alternative. Only in Farmland II do a majority of the respondents perfer this alternative. Generally, the users in rural communities indicate greater agreement with this course of action than do the urban respondents. The respondents of five of the six communities are nearly equally divided as to the acceptability of imposing a mill levy. There is a slight tendency to reject this alternative. The strongest rate of rejection of a tax levy is found in Farmland II. Finally, the most frequently preferred alternative is to seek federal aid. The strongest support for this alternative is found in the rural communities. The populations in all the communities are fairly evenly divided on this issue.

The data indicate that there is weak support for the increase of water personnel and somewhat greater support for an improvement in the salaries received by water officials. There is strong support for a state law to control rates but very weak support for federal regulation of the local agency. Federal aid is the most preferred way to deal

with indebtedness, a tax levy gains somewhat less support, and a rate increase is the least preferred alternative. Quite interestingly, the strongest support for federal aid is found in rural communities even though respondents from these communities indicate a greater propensity to reject federal regulation.

Planning alternatives. The increased planning of water resources is required if rising demands for water are to be met. The distribution of public support for increased planning activities is a critical influence upon the development of effective planning activities. The respondents in all of the communities give substantial support to increased community planning to assure adequate water supplies. The attitudes toward increased planning are reported in Table 6, page 58. The strongest support for increased planning comes from the urban community, Rocky Ridge II. There is no significant opposition to increased planning in any of the communities. The only evidence of any substantial lack of support for increased planning is found in Euphoria in which over one-third of the respondents indicate a lack of interest in increased planning. There is slightly greater interest in planning in the rural communities than in the urban communities, but the urban communities who are most dissatisfied with their water service indicate somewhat more intense support for planning than is present in the rural communities.

Table 6

Support for Increased Community Planning
to Assure Water Supply
by Community:

In Percentages

	Strongly Approve	Approve	Disapprove	Undecided or Don't Care
Euphoria	20.6	41.2	3.4	34.8
Rocky Ridge I	46.9	36.9	2.7	13.5
Rocky Ridge II	75.3	16.8	1.3	6.6
Happy Valley	43.0	49.2	0.0	7.7
Farmland I	38.3	52.0	1.1	8.3
Farmland II	41.6	51.6	0.0	6.6

The problem of planning was probed more deeply in the Farmland sample. The data indicate that the vast majority of the respondents strongly support increased planning and strongly reject the proposition that planning is not necessary. They generally believe that the users should take a greater role in the planning process and that the activity is too important to be left to water officials alone. However, over 90% of the respondents in these two communities believe that effective planning for future water needs is being conducted within their water service areas. Therefore, the data clearly indicate that the respondents strongly support the idea of planning, that they believe effective planning is going forward, and that even more effort should be given to this activity.

System alternatives. The final set of data to be presented surveys the perceptions of users on the problem of the future availability of water in the area and their attitudes toward different alternatives to protect and to increase the supply of water. Generally, the respondents doubt that there will always be plenty of water in this area and that threats of water loss have been exaggerated. The respondents from rural areas are more likely to believe that a plentiful water supply is threatened than are the respondents from urban areas. However, the data presented in Table 7, page 60 indicate substantial worry in all of the communities about future water supply.

The respondents from all of the communities indicate that the state should protect its water interests first and generally disagree that the state should give up a part of its water to meet the needs of population growth in other parts of the country. The respondents from five of the six communities believe that urban and industrial growth should be regulated to preserve water supplies. Only in Rocky Ridge I which has the largest concentration of working class respondents is a contrary trend evident. Therefore, the data indicate that there is a strong support throughout the area for the conservation of the local water supply and that action should be taken to preserve the water supply from both internal and external threats. The strongest support for this position is found in the rural communities.

Somewhat less support is found for two long range and costly alternatives to enhance local water supplies, i.e., the conversion of salt water and inter-regional water transfers. The strongest support for these alternatives is found in the rural communities. The cost factor appears to be the most substantial basis for rejection of these

Table 7

Evaluation of Future Water Supply Problems
by Community:
In Percentages

	Euphoria	Rocky Ridge I	Rocky Ridge II	Happy Valley	Farm-land I	Farm-land II
Colorado ought to protect its water interests first.	95.1	86.9	94.4	90.6	98.2	100.0
Colorado's urban and industrial growth should be regulated in order to preserve the farmer's water.	68.0	49.5	62.1	68.5	82.7	63.3
If population increases in Arizona demands it, Colorado should give up some of its water.	29.3	32.6	32.1	34.6	13.0	18.6
There will always be plenty of water for us in this part of the country.	42.4	29.5	27.4	22.2	15.1	11.8
Threats of water loss are greatly exaggerated.	36.5	34.9	27.1	16.3	29.3	30.2
Conversion of salt water into fresh water is necessary for preservation of Colorado's water.	44.6	45.0	45.4	47.1	49.0	57.4
Despite the tremendous cost, we ought to think of bringing water from the Columbia River to Colorado.	22.1	30.2	29.2	36.7	43.9	62.0

alternatives. Generally, the respondents appear to prefer the conservation of present water supplies rather than engaging in costly means of gaining new supplies of water.

Summary

The primary purpose of this chapter is to explore the distribution of attitudes and perceptions of water users as they relate to the evaluation of water problems and water agency performance. The dimensions analyzed involve the levels of satisfaction of the users with their water service, their water agencies, and their water officials and the kinds of alternatives to the present state of affairs that they would support.

The data indicate that there is generally a strikingly high level of interest in water matters among the users. The users from the rural communities evidence a greater interest in water matters than do the respondents from the urban communities. There is at least a moderate satisfaction with the way in which the agencies are managed with the bulk of the users believing that adequate management is present. The rural users show greater satisfaction with the water management than do the urban users.

There is general agreement among the users that rates are too high. This is true in both rural and urban communities. The users of private agencies are slightly less likely to believe that rates are too high than are those who receive service from public agencies. The largest number of users tend to believe that their water service is about the same as that in other communities. The rural users have a somewhat more positive evaluation of their water service than is present in the urban communities.

The data indicate a tendency on the part of most users to believe that water officials are responsive to citizen needs and attempt to effectively deal with user problems. There is a general positive evaluation of water officials and the responsiveness of these officials. The strongest positive evaluations are found in the rural areas.

There is moderate to weak support for increasing the number of personnel in the water office and somewhat stronger support for increasing the salaries of water personnel. A somewhat more supportive set of attitudes is present in the rural areas.

There is strong support for a state law to control water rates in all of the communities, but very weak support for federal regulation. The most intense rejection of such regulation is found in the rural communities. There is the substantive support for federal aid to pay off indebtedness. There is somewhat less support for use of a tax levy as a means of paying off indebtedness and very weak support for a rate increase for this purpose. There is a relatively slight difference between urban and rural users on these dimensions.

There is strong support for increased planning and a number of means to conserve and increase water supplies in all of the communities. The strongest support comes from the rural areas.

Generally, the strongest support and most facilitative attitudes are found in the rural areas. There are few systematic differences between attitudes of users of private and public agencies. The differences that are present seem to relate to the perception that pricing policy is the primary means of income for the private agency.

CHAPTER IV

POLITICAL SYSTEMS AND WATER SYSTEMS

Objectives and Techniques

Pursuit of the major objective of this study proved the most rewarding. Efforts to characterize and relate systems surfaced a number of significant regularities across the samples. This has permitted an order of generalization which appears to have considerable utility for both water managers and future researchers.

The data reveal that insofar as the public is concerned, distinct political decision-making systems do exist in the special issue areas of the public domain; and most importantly, they maintain a rather sturdy and regular independence of the more generalized political systems (e.g., state and national systems) at most junctures. It is also evident that the traditional socio-economic-situational variables (e.g., family income, formal education level, etc.) do not possess the power to classify political variables of the local water issue systems that they seemingly possess for more general social and political system variables. Moreover, despite the parochial character of the samples taken for this study (i.e., all samples were drawn from publics of a limited geographic area), the regularities in relationships appear to be sufficiently striking to conclude that more particularized and specialized systems are regularly related to more general systems at specific points. They are related by differing levels or strengths, depending upon the characteristics of the smaller or more particular systems, and also upon how far these links are removed or stretched

from the general system. On the other hand, many general system variables relate to the special water system variables hardly at all. It will also be shown that general system variables relate at some points and not at others and that the strength of relationships fades as one traces them along a line that moves further from the more general system. Community participation, for example, relates more closely to water variables than general participation.

One of the most salient findings of this study, therefore, is the identification of special issue political systems (i.e., a water political system) which maintain lives of their own independent of the more general systems to which they are related at selected points. The elements of the general systems are exogenous to a water political system, however, exerting their influences on it from the outside. In short, the more general political systems are not a part of the water inner-system. As such they can be conceptualized as parameters to it much as the weather outside a building is a parameter of the building's heating system. In brief, the general system operates to give character to the water political system, but remains largely independent of it.

Finally, the team has found the perceptual fields of users in the public realm to be a useful research resource for identifying system elements. Similarly, communications theory has been extremely useful for developing and testing hypotheses concerning linkages and systems flow.

These findings have resulted from a research team's pursuit of this study's ultimate research objective. That objective sought to identify and characterize political systems in the water issue area. A basic feature of such a research pursuit entailed specifications of

parameters of water political systems because subsequent attempts to measure relationships within systems, as well as between them, are dependent upon adequate characterization and description of the systems themselves.

Theoretical Problems and Considerations

Pursuit of the overall objective brought the investigators face to face with the many problems that have impeded the capability of social scientists to explain and/or predict with a high degree of accuracy for decades and even centuries. At the core of this problem is the interactive character of social variables. As stated in the preliminary report to Phase I of this research, the existing mathematical and statistical tools are not adequate for measurement and testing of interactive data. Furthermore, systems for classifying social data are far from being as developed and refined as they are for the hard sciences such as physics and chemistry, for example. Acknowledged difficulties then are: (a) the high degree of interaction and volatility which characterizes social data generally, and (b) the inadequacies associated with the procedures, instruments, and techniques which have been developed for collecting, classifying and analyzing social data.

The theory and findings in the literature of field theorists in perceptual psychology provide the basis for several assumptions which will not be tested directly in the report. First, it is assumed that individuals respond to their physical and cultural environments in terms of the way they perceive them; that is, if a person perceives a group or an event to exist, he will respond to his environment in

ways that allow for its existence, irrespective of what others may or may not perceive. This, in effect, constrains the individual response patterns, although it does not necessarily limit it to a single response in most instances. The field of responses is narrowed and constrained from what would be a random distribution of responses if such constraints or other types did not exist. Therefore, variance from what would be a random distribution of responses should provide at least a rough guage of the constraining effect.[1]

Correlations, communalities, and factor loadings can be conceptualized as measures of constraining effects of one variable on another. Essentially, if variation or change in the characteristic conformation of behavior of Variable A correlates with or is associated with the change or variation in Variable B, time after time, we can tentatively conclude that they are constraining each other to some extent or A is constraining B if A always precedes B in terms of time or some other dimension.

In the case of perception and response, it is rather obvious in terms of systems modeling that response patterns affect perceptions and vice-versa. However, it is definitionally and empirically true, that at any response time, a given perceptual set precedes it. The basic analytical problem is the means one must develop for holding perception constant and free of response effectors at the specific points in time when perception is to be described and measured. An ancillary problem is how to identify the exogenous effectors on the system of relationships between perception and response.[2]

As is characteristic of most social data, the data of this study are, at best, quite gross. They are also curvilinear and many of the

variables interact at a very high rate. Much of the data is not normally distributed; much of it is nominal. Concerted attempts were made to retrieve as much ordinal and interval data as possible, but in the case of interval data, many items are rendered suspect because the intervals actually may not be equal, and the researchers have found no way of making certain that they are equal. Therefore, all data in this report have been treated as if they were nominal, or at best, no more than ordinal. Tests for relationships employ the Tau Gamma (γ) for association and Chi Square (X^2) for level of significance. The Gamma is a variant form of rank correlation for ordinal data which is sensitive to curvilinear data conformations. It provides an estimate of association between two ordinal variables and ranges from a -1.00 to a +1.00. A -1.00 means that high values on one variable are associated with low values on the other variable; a +1.00 means that high values on one are associated with high on the other and low with low; a .00 means that the two variables are unassociated. The X^2 test tells how far the data conformation or distribution varies from the expected or a random (unbiased) distribution of data points for the two variables. Finally, the Gamma has the further virtue of being useful in extracting the influence of a third variable on the relationship between two other variables.[3] In short, the Gamma has utility in measuring the relationship of two variables when they are placed under controls.

The reader should be apprised of the manner in which Gamma, an ordinal symmetric measure, is being used in this stage of research. Consistent use of the Chi Square and Gamma has been employed throughout the report. Gamma is employed primarily to locate trends and

to specify directions in which the data is moving, piling, or ordering. Where a small degree of asymmetry had to be tolerated to avoid sacrifice of information on other counts, checks were run in each case to determine the distortion in the Gamma coefficient so as not to lead anyone to erroneous inferences. After all, not enough is known about the essential characteristics of many types of social variables to give investigators the luxury of knowing how much knowledge is lost or gained when the parameters of some of the data are changed. If large distortions were noted, the data was collapsed with full appreciation of the loss of refinement and sensitivity involved. Most Gamma coefficients, however, are not to be read as providing discretely specific degrees of association or dissociation. Probably no Gamma value should even be so read anyway, since they are no more than estimates in the first place, and are really telling one how the data ranks or piles. The research team has used both the controlled and uncontrolled Gammas as indicators of trends and direction only.

Tests for Potential Socio-Economic Determinants

Socio-economic-situational variables, such as occupational status, family income, and formal education level, have been used extensively by investigators and political advisors in the past as characteristics which classify social attitudes, perceptions, and behavior. On the basis of this reliable ability to classify, it has frequently been assumed, for example, that a significant relationship between income level and voting patterns will enable the investigator to predict voting on the basis of income distribution. In many instances,

such findings have been successful in predicting probable outcomes and have proved useful even to aspiring candidates at election time. The first tests reported here measure the capability of socio-economic variables to classify political participation, political attitudinal, and water system variables.

A series of tests across four samples revealed that education levels demonstrate a pattern of relationships which typify the capabilities of socio-economic-situational dimensions as found in the prior investigations. The results in Table 8, page 70, support the traditional findings in the literature. Education is associated at significant levels with income level (see Item I) as well as other socio-economic variables not shown. A similar pattern exists for the association between education and levels of political participation (see Item II). The Index of General Political Participation measures levels of activity a person reports as having in the general political system (i.e., voting, participation in political organizations, discussion of national and state political issues with friends, peers, co-workers, etc.). The Community Participation Index measures similar levels of activity in local issues and affairs.[4] In this instance, the higher the level of education, the higher the level of participation on both indexes.

Moving to Item III, the education variable shows a significant level of association to measures of general political orientation. The Political Efficacy Scale measures the extent to which an individual feels personally effective in the general political system.[5] The Political Saliency Index measures the extent to which politics and political issues are considered important to the individual vis-a-vis

Table 8

Association of Education with General Political System and Water System Variables (Gamma Value with Significance Levels in Parenthesis)

		Happy Valley	Farmland	Euphoria	Rocky Ridge
General Political System Variables					
I.	Income	.19 (.001)	.15 (.03)	.37 (.001)	.28 (.001)
II.	General Political Participation	ND	.20 (.06)	.23 (.001)	.24 (.01)
	Community Political Participation	ND	.39 (.001)	.24 (.001)	.21 (.01)
III.	Political Efficacy	.18 (.10)	.26 (.005)	.27 (.001)	.30 (.001)
	Political Alertness	ND	.19 (.11)	.21 (.002)	.14 (.23)
	Political Saliency	ND	.33 (.001)	.20 (.001)	.16 (.04)
	Political Interest	.21 (.12)	.27 (.02)	.20 (.001)	.25 (.001)
IV.	Political Cynicism	-.22 (.50)	-.05 (.29)	-.17 (.002)	-.09 (.90)
	Attitude Toward Change	ND	.24 (.07)	.18 (.22)	.10 (.64)
	Attitude Toward Community	-.10 (.81)	.12 (.80)	.18 (.22)	.00 (.006)
	Personal Futility	-.21 (.91)	-.13 (.11)	-.14 (.001)	-.16 (.37)
	Low Tax Attitudes	ND	.07 (.42)	.17 (.22)	ND
Water System Variables**					
V.	Interest in Water	.19 (.98)	-.07 (.27)*	.07 (.01)	.13 (.68)
	Peer Communications	-.07 (.38)	.00 (.55)	.11 (.001)	.18 (.10)
	Communication with Water Management	.05 (.72)	-.07 (.64)	-.02 (.001)	.19 (.001)
	Public's Characterization of Management	.02 (.33)	-.06 (.96)	.03 (.11)	-.08 (.48)
	Perception of Management Response	.29 (.13)	.21 (.09)	.08 (.11)	.08 (.34)
	Efficacy in Water Decision-making System	.31 (.24)	.20 (.44)	-.07 (.14)	.09 (.45)
	Expectations of Management Capabilities	.15 (.53)	.16 (.24)	-.12 (.95)	.01 (.25)

* denotes violation of regular patterns

** see pages 78-79 for definition of Water System Variables. All Water System Variables score low to high.

other social matters.[6] The Political Alertness Index measures the degree to which a person is aware of political issues, the political positions, identifications, and actions of his peers.[7] The Measure of Political Interest defines the degree of intensity to which a person reports being interested in politics and political affairs. Once again, education is positively associated with levels of orientations in the general political system.

Both significance and the level of association begin to fade some when education is posed against general political attitudes (see Item IV). These attitudes include levels of political cynicism[8] which measures the extent to which individuals place trust and faith in their public officials to act in the public interest, to remain above corruptive influences, etc.; a scale of attitudes toward social, political, economic, and cultural change which measures the extent to which persons accept or reject and fear changes from the status quo;[9] a simple question which identifies the respondent's assessment of the community in which they live as a good, a fair, or a bad community in which to reside; a scale of the sense of personal futility[10] which defines the respondent's outlook toward life in general, measuring the depth of hopelessness, pessimism about life's fortunes, anomic tendencies, and feelings of powerlessness over one's destiny; and a scale of tax attitudes[11] which measures the extent to which persons will generally tolerate or oppose taxes. Neither the associations nor their levels of significance are as strong between education and these variables as they are with those presented previously, although Tables 9 and 10 show that the attitudinal dimensions tend to be significantly associated with each other and with the measures of political participation.

Relationships under Item V demonstrate that linkages are even more faded, and in many cases nearly non-existent once the interrelated system of water variables is reached. Associations are not only extremely low, but in all but four or five cases, the significance levels indicate little or no predictive capability with respect to education and the water system variables. Yet, as it will be seen later, the water system variables are interrelated and do relate to certain other political and social dimensions as well.

In summary, the tests indicate that while the expected relationships between socio-economic-situational (S.E.S.) variables and general political system variables are present, the association and significance levels decline substantially when water system variables are tested. Therefore, the data indicate that traditional S.E.S. measures do not provide a very useful means of characterizing water system attitudes and patterns of behavior. The predictive power for S.E.S. variables is weak or non-existent for local water systems.[12]

Interrelationships of General System Attitudes

Variables on Table 9, pages 73 and 74, are all characterized in the previous section and comprise a set of generalized attitudes and orientations toward the individual's political and social environment. All tend to be closely associated at high levels of significance with the exception of "Attitude Toward the Community," which shows little relationship to others in many instances.

A model of political man emerges with the following associated characteristics: high political interest, high political saliency, a low sense of futility, a trusting stance toward the political system

Table 9

Interrelationships of Selected General
Political System Attitudes
(Gamma Values with Significance Levels in Parenthesis)

	Happy Valley	Farmland	Euphoria	Rocky Ridge
Political Efficacy vs.				
Political Interest	.34 (.02)	.21 (.06)	.41 (.001)	.26 (.001)
Political Saliency	ND	.27 (.001)	.39 (.001)	.17 (.04)
Personal Futility	-.28 (.001)	-.43 (.001)	-.48 (.001)	-.37 (.001)
Political Cynicism	-.18 (.09)	-.39 (.001)	-.50 (.001)	-.37 (.001)
Attitude Toward Change	ND	.30 (.001)	.41 (.001)	.32 (.001)
Low Tax Attitudes	ND	-.36 (.001)	-.42 (.001)	ND
Attitude Toward Community	.04 (.23)	-.36 (.001)	.22 (.002)	-.04 (.48)
Political Interest vs.				
Political Saliency	ND	.76 (.001)	.84 (.001)	.68 (.001)
Personal Futility	ND	-.34 (.005)	-.27 (.001)	-.16 (.02)
Political Cynicism	.11 (.31)	-.21 (.13)	-.32 (.001)	-.02 (.51)
Attitude Toward Change	ND	.22 (.01)	.31 (.001)	.24 (.001)
Low Tax Attitudes	ND	-.13 (.03)	-.20 (.001)	ND
Attitude Toward Community	.13 (.006)	-.01 (.45)	.02 (.52)	-.01 (.21)
Political Saliency vs.				
Personal Futility	ND	-.26 (.001)	-.21 (.21)	-.22 (.06)
Political Cynicism	ND	-.13 (.05)	-.30 (.01)	-.07 (.35)
Attitude Toward Change	ND	.22 (.01)	.30 (.001)	.23 (.01)
Low Tax Attitudes	ND	-.18 (.16)	-.22 (.001)	ND
Attitude Toward Community	ND	.12 (.01)	.08 (.35)	.06 (.39)
Personal Futility vs.				
Political Cynicism	.16 (.16)	.38 (.001)	.42 (.001)	.17 (.22)
Attitude Toward Change	ND	-.46 (.001)	-.38 (.001)	-.36 (.001)
Low Tax Attitudes	ND	.39 (.001)	.37 (.001)	ND
Attitude Toward	-.13 (.34)	-.25 (.06)	-.16 (.03)	.06 (.93)*

* denotes violation of regular patterns

C O N T I N U E D

Table 9

Interrelationships of Selected General
Political System Attitudes
(Gamma Values with Significance Levels in Parenthesis)

C O N T I N U E D

	Happy Valley	Farmland	Euphoria	Rocky Ridge
Political Cynicism vs.				
Attitude Toward Change	ND	-.22 (.02)	-.33 (.001)	-.19 (.03)
Low Tax Attitudes	ND	-.28 (.01)	-.42 (.001)	ND
Attitude Toward Community	-.25 (.15)	-.16 (.52)	-.08 (.004)	-.05 (.16)
Attitude Toward Change vs.				
Low Tax Attitudes	ND	.28 (.001)*	-.30 (.001)	ND
Attitude Toward Community	ND	.28 (.05)	.06 (.07)	-.05 (.88)*
Low Tax Attitudes vs.				
Attitude Toward Community	ND	-.16 (.12)	-.02 (.003)	ND

* denotes violation of regular patterns

Legend: Political Efficacy scores low to high efficacy
Political Interest scores low to high interest
Political Saliency scores low to high saliency
Political Futility scores low to high sense of futility
Political Cynicism scores from trusting to cynical
Attitude Toward Change scores opposes to favors change
Low Tax ideology scores from favors to opposes taxes
Attitude Toward Community scores from negative to positive attitude toward the community

and its decision-makers, orientations that are supportive of change, a favorable orientation toward taxes, and a moderately positive tendency to look upon the community with favor. The patterns over the four samples exhibits a regular pattern in a manner that can not be ignored. Is this also the model of the political participant?

Political Participation

Two political participation indexes provide guages of the aggregate amounts of political action in which an individual engages. One index aggregates personal involvement and action at the community level and the other identifies the extent of his involvement in state and national political matters (see page 69 for further definition). Tables 10 and 11 on pages 76 and 77 display the degrees of association which the levels of general and community participation have with the general attitudes and the special water system variables. Data from the first sample, Happy Valley, is not included because several items used in the participation indexes were added after Happy Valley data had been collected and partially analyzed.

Relationships between participation and the general attitude variables are remarkably regular, rational, and strong. It should be noted that the interest, efficacy, and saliency variables are much more strongly associated with both participation indexes than are the other attitudes and orientations. General participation, moreover, shows a higher degree of association than does community participation. However, it is also noteworthy that this tendency for community participation to be more weakly associated with the general attitude syndrome extends over the entire set of general variables. This provides a

Table 10**

Association of General Participation with Selected Attitudes
(Gamma Value with Significance Levels in Parenthesis)

	Farmland	Euphoria	Rocky Ridge
General System Attitudes			
Political Interest	.47 (.001)	.68 (.001)	.83 (.001)
Political Saliency	.59 (.001)	.69 (.001)	.69 (.001)
Political Efficacy	.34 (.001)	.49 (.001)	.25 (.001)
Personal Futility	-.20 (.08)	-.20 (.03)	-.22 (.01)
Political Cynicism	-.18 (.30)	-.28 (.001)	-.02 (.21)
Attitude Toward Change	.06 (.16)	.17 (.14)	.23 (.01)
Low Tax Attitudes	-.26 (.46)	-.39 (.001)	ND
Attitude Toward Community	.24 (.15)	.22 (.18)	.09 (.02)
Water System Variables***			
Interest in Water	-.03 (.68)*	.44 (.001)	.37 (.001)
Peer Communications	.09 (.25)	.42 (.001)	.27 (.001)
Communication With Water Management	.16 (.46)	.34 (.14)	.23 (.001)
Public's Characterization of Water Management	-.04 (.58)	.05 (.36)*	-.04 (.35)
Public's Perception of the Water Management Response	.08 (.01)	.14 (.09)	.05 (.90)
Efficacy in Water Decision-making System	.20 (.24)	.00 (.88)	.17 (.43)
Public Expectations of Water Management Capabilities	-.04 (.35)	-.13 (.13)	-.02 (.11)

* denotes violations of regular patterns

** No comparable participation data is available for Happy Valley

*** see pages 78-79 for definition of Water System Variables. All Water System Variables score low to high.

Table 11**

Association of Community Participation Variables with Selected Attitudes
(Gamma Value with Significance Levels in Parenthesis)

	Farmland	Euphoria	Rocky Ridge
General System Attitudes			
Political Interest	.49 (.001)	.48 (.001)	.43 (.001)
Political Saliency	.48 (.001)	.53 (.001)	.44 (.001)
Political Efficacy	.25 (.02)	.34 (.01)	.22 (.01)
Personal Futility	-.14 (.16)	.10 (.89)*	-.15 (.42)
Political Cynicism	-.13 (.002)	-.27 (.001)	-.12 (.31)
Attitude Toward Change	.10 (.43)	.29 (.001)	.15 (.10)
Low Tax Attitudes	-.13 (.25)	-.24 (.04)	ND
Attitude Toward Community	.14 (.33)	.18 (.14)	.06 (.18)
Water System Variables***			
Interest in Water	.13 (.20)	.36 (.001)	.42 (.001)
Peer Communications	.25 (.03)	.37 (.001)	.37 (.001)
Communication With Water Management	.26 (.05)	.33 (.001)	.40 (.001)
Public's Characterization of Water Management	.16 (.43)	.06 (.12)	-.08 (.56)*
Public's Perception of the Water Management Response	.21 (.04)	.05 (.001)	.09 (.25)
Efficacy in Water Decision making System	.26 (.01)	.05 (.48)	.06 (.45)
Public Expectations of Water Management Capabilities	.10 (.84)*	-.05 (.89)	-.03 (.002)

* denotes violations of regular patterns

** No comparable participation data is available for Happy Valley.

*** see pages 78-79 for definition of Water System Variables. All Water System Variables score low to high.

basis for future modelers to anticipate or hypothesize that such factors as political interest and political saliency comprise rather severe constraints on political participation, especially participation in state and national politics (e.g., voting, listening, reading, attending party meetings, etc.), but the constraining effect will decline as participation becomes more local and parochial in character.

Levels of association and regularities across both tables indicate that the model of political man fits the political participant as hypothesized; and the model for the community participant shows a regularly lower level of associations than that for the general participant. It is fairly clear that attitudes are operating as constraints on participation and vice-versa, possibly depending upon which system is intercepted for measurement and when it is intercepted.

Coming now to the system of interrelated water variables, both Tables 10 and 11 show, with some important exceptions, generally much lower levels of association and significance between participation and water system components than between participation and general system variables. Interest in Water is defined by a single question which identifies the respondent's declared level of interest in water issues and activities. The Peer Communications Index identifies, by means of three items, the extent to which a person communicates about water issues and activities with his peers (friends, neighbors, and co-workers outside the family). The Index of Communication with Water Management identifies the degree to which a person communicates about water matters, issues, and activities with water officials and other types of local non-water officials (e.g., city officials, county officials).

Three indexes characterize the public perceptions of water management and its actions. The Public Characterization Index of Management appraises the general or overall quality of the management system as a serving institution. The Index of Perceived Management Responses identifies how the public expects their water managers and decision-makers to respond to individual and public demands. The Index of Management Capabilities measures the public's perception of the type of competence required to manage water systems and make decisions. This latter index measures a dimension which is at a somewhat more abstract level and is less directly tied to the empirical situation. Finally, Efficacy in Water is measured by an index of several items which indicate the extent to which a person feels he can affect the operations, decisions, and outcomes in the water system.

A direct examination of the Gamma values on Tables 10 and 11 indicates that water variables have little effect on or are affected very little by levels of more general national and community participation. Yet, a determined pattern of relationships emerges from the two urban communities where participation has a significantly high degree of association between political participation and measures of interest in water, peer communications about water, and communication with water management and other local officials. The data also reveal traces or hints of a closer association between community participation and the water variables than between general participation and the same set. Many of the associations with the evaluative and efficacy indexes, however, are so weak and so insignificant that nothing should be concluded other than to raise questions and hypotheses for future investigations.

On Table 10 it also appears that interest in water, peer communications, and management communications are associated with general participation indices in a declining ordinal manner. In a systems context this could mean that peer communications is an intervening variable between interest and communications with management. A subsequent examination in the latter pages of this report of the interrelationships within the water system itself seemingly validates the hypothesis that peer communications do intervene. For example, the probability that interest in politics will affect communications with management goes up if peer communications is high.

In summary, general system and community system participation appears to have little constraining effect on the interrelated water system variables under observation, except in the two urban communities where they show a strong relationship to variables that naturally possess input characteristics for the water system. In Farmland, however, only the communications variables show much strength of association and their levels of association with participation are below the levels for the urban communities. This provides ground for an important hypothesis; namely, that communications variables are formidable links and potential feeder belts between the systems.

Relationships Between General Attitudes and Water System Factors

When the general attitude measures are arrayed against water system variables, a few of the previously noted regularities weaken and tend to disappear, (see Table 12, pages 81 and 82). How the public evaluates and characterizes the overall water agency functions of its management apparently is disassociated from the generalized attitudinal

Table 12

Relationship of General System Attitudes to Water System Attitudes
(Gamma Values with Significance Levels in Parenthesis)

	Political Efficacy	Political Salience	Political Interest	Political Cynicism	Personal Futility	Attitude Toward Change	Low Tax Attitude
Interest in Water							
Happy Valley	.03 (.30)	ND	.28 (.35)	-.07 (.64)	-.23 (.03)	ND	ND
Farmland	.07 (.45)	.16 (.10)	.15 (.17)	-.03 (.15)	-.11 (.01)	.06 (.04)	-.13 (.05)
Euphoria	.21 (.001)*	.34 (.001)	.41 (.001)	-.22 (.001)	-.11 (.46)	.36 (.001)*	-.24 (.001)
Rocky Ridge	-.02 (.16)	.33 (.001)	.34 (.001)	-.02 (.41)	-.21 (.07)	.18 (.17)	ND
Public Expectations of Water Management Capabilities							
Happy Valley	.14 (.28)	ND	.07 (.001)	-.16 (.13)	-.19 (.05)	ND	ND
Farmland	.29 (.04)	.15 (.24)	.22 (.06)	-.26 (.001)	-.19 (.34)	.21 (.20)	-.22 (.24)
Euphoria	-.26 (.001)*	-.02 (.01)*	-.03 (.001)*	.28 (.002)*	.18 (.001)*	-.25 (.001)	.33 (.001)*
Rocky Ridge	.21 (.002)	.08 (.04)	.06 (.34)*	-.27 (.001)	-.22 (.005)	.23 (.008)	ND
Peer Communications							
Happy Valley	.13 (.34)	ND	.18 (.49)	.17 (.24)	-.04 (.37)	ND	ND
Farmland	.05 (.13)	.18 (.01)	.14 (.05)	-.02 (.01)	-.05 (.02)	-.02 (.02)*	-.06 (.95)
Euphoria	.17 (.13)	.24 (.001)	.21 (.02)	.07 (.35)	-.14 (.12)	.23 (.001)*	-.11 (.26)
Rocky Ridge	.16 (.01)	.28 (.001)	.16 (.15)	-.07 (.66)	-.17 (.11)	.08 (.23)	ND
Communication with Water Management							
Happy Valley	-.13 (.22)	ND	-.29 (.36)*	.25 (.18)*	.20 (.42)	ND	ND
Farmland	.14 (.27)	.08 (.27)	.04 (.73)	-.06 (.54)	.01 (.11)	-.11 (.04)*	-.03 (.45)
Euphoria	.03 (.22)	.16 (.06)	.21 (.27)	-.04 (.58)	-.13 (.83)	.03 (.01)	-.07 (.54)
Rocky Ridge	.11 (.06)	.25 (.001)	.20 (.02)	.02 (.21)	-.11 (.32)	.08 (.84)	ND

* denotes violations of regular patterns

C O N T I N U E D

Table 12

Relationship of General System Attitudes to Water System Attitudes
(Gamma Values with Significance Levels in Parenthesis)

C O N T I N U E D

	Political Efficacy	Political Salience	Political Interest	Political Cynicism	Personal Futility	Attitude Toward Change	Low Tax Attitude
Public's Characterization of Water Management							
Happy Valley	.02 (.84)	ND	.02 (.22)	-.12 (.10)	-.02 (.37)	ND	ND
Farmland	.18 (.05)	-.07 (.76)	-.18 (.56)*	-.13 (.18)	.02 (.43)	.03 (.69)	-.05 (.92)
Euphoria	.00 (.06)	.02 (.93)	.03 (.08)	.00 (.55)	.10 (.37)	.02 (.86)	.02 (.13)*
Rocky Ridge	.04 (.25)	-.05 (.73)	.05 (.12)	-.18 (.04)	.05 (.92)	.08 (.52)	ND
Public Perception of the Water Management Response							
Happy Valley	.21 (.44)	ND	.32 (.20)	-.27 (.01)	-.11 (.33)	ND	ND
Farmland	.31 (.001)	.10 (.07)	.06 (.005)	-.15 (.01)	-.06 (.15)	.10 (.01)	-.07 (.05)
Euphoria	.23 (.04)	.24 (.05)	.24 (.21)	-.25 (.003)	-.16 (.54)	.12 (.04)	-.16 (.56)
Rocky Ridge	.21 (.03)	.05 (.28)	.00 (.34)	-.24 (.03)	-.11 (.24)	.12 (.25)	ND
Sense of Effectiveness in Water Decision							
Happy Valley	.27 (.19)	ND	.32 (.08)	-.29 (.04)	-.30 (.04)	ND	ND
Farmland	.43 (.001)	.20 (.09)	.13 (.001)	-.20 (.09)	-.24 (.30)	.12 (.38)	-.28 (.01)
Euphoria	-.23 (.001)*	.06 (.56)*	.03 (.19)	.25 (.001)*	.10 (.002)*	-.02 (.001)*	.09 (.23)*
Rocky Ridge	.30 (.001)	.18 (.001)	.08 (.43)	-.16 (.11)	-.26 (.02)	.21 (.14)	ND

* denotes violation of regular patterns

Legend:
Political Efficacy scores low to high efficacy
Political Interest scores low to high interest
Political Salience scores low to high saliency
Political Futility scores low to high sense of futility
Political Cynicism scores from trusting to cynical
Attitude Toward Change scores opposes to favors change
Low Tax ideology scores from favors to opposes taxes
Attitude Toward Community scores from negative to positive attitude toward the community

framework. Yet, an examination of Table 13, page 84, shows that the public evaluation of management functions and performance tends to be closely associated with the public's evaluation of the management response as well as its characterization of what is necessary to perform their water management functions. It is also closely associated with the measure of a sense of effectiveness in the water system. And Table 12, pages 81 and 82, shows that a sense of political efficacy, political cynicism, and personal futility tend to be associated with two of these (i.e., evaluation of response and characterization of what it takes to perform water managing functions) variables despite their sturdy independence of the third, the evaluation of overall management functions and performance. The table also indicates that the three water variables, (sense of effectiveness in the system, perceptions of management response, and the index measuring what the public perceives to be necessary to perform management functions) are the more closely associated with the general attitudes. Two of the measures display the greater strength of significant association (sense of effectiveness and management capability). Hence, they just might be operating, in part, as inputs to the public's perceived management system to which it is assumed in this report that the public responds.

As was stated previously, the index of perceived needs for management functions measured a more abstract and generalized congeries of uni-dimensional orientations toward the water system than do the other two measures under observation with it. It might, therefore, be expected to be more closely correlated with and constrained by the general attitude measures. As such, it and the other somewhat abstract measures (a sense of effectiveness in water decision-making) may provide partial

Table 13

Basic System Associations

GAMMA VALUE AND SIGNIFICANCE LEVEL

	Happy Valley	Farmland	Euphoria	Rocky Ridge
γ_{eu}	.20 (.38)	.28 (.06)	.19 (.03)	-.01 (.82)
γ_{ew}	.36 (.007)	.33 (.02)	-.24 (.006)	.22 (.006)
γ_{ev}	.30 (.05)	.20 (.02)	.39 (.001)	.33 (.001)
γ_{ex}	.69 (.001)	.28 (.001)	-.53 (.001)	.33 (.001)
γ_{ey}	.10 (.30)	.11 (.14)	.41 (.001)	.12 (.52)
γ_{ez}	-.17 (.55)	.20 (.03)	.45 (.003)	-.09 (.70)
γ_{uv}	.11 (.40)	.05 (.47)	.03 (.03)	.08 (.50)
γ_{uw}	.14 (.46)	.16 (.17)	-.20 (.001)	-.39 (.001)
γ_{ux}	.30 (.79)	.15 (.48)	-.23 (.001)	-.07 (.20)
γ_{uy}	.52 (.002)	.22 (.006)	.69 (.001)	.52 (.001)
γ_{uz}	.09 (.37)	.40 (.01)	.61 (.001)	.43 (.001)
γ_{vw}	.28 (.08)	.16 (.07)	-.29 (.001)	.22 (.005)
γ_{vx}	.52 (.003)	.14 (.003)	-.52 (.001)	.23 (.001)
γ_{vy}	.15 (.05)	.05 (.28)	.39 (.001)	.10 (.02)
γ_{vz}	-.05 (.65)	-.10 (.11)	.35 (.001)	-.14 (.23)
γ_{wx}	.50 (.001)	.12 (.44)	.38 (.001)	.20 (.002)
γ_{wy}	.07 (.72)	.10 (.22)	-.33 (.001)	-.30 (.001)
γ_{wz}	-.11 (.39)	.03 (.001)	-.37 (.001)	-.39 (.001)
γ_{xy}	.32 (.02)	.14 (.09)	-.48 (.001)	.04 (.86)
γ_{xz}	.02 (.001)	.57 (.001)	-.12 (.001)	.33 (.001)
γ_{yz}	.18 (.02)	.56 (.001)	.85 (.001)	.46 (.001)

Legend:

e = sense of effectiveness in water decisions

u = interest in water matters

v = public's perception of water management capabilities

w = public's characterization of water management

x = public expectations of the water management response

y = peer communications

z = communication with water management

input links from the more generalized social and political attitude frameworks to the specialized realm of water. They would, thereby, constitute probable constraints on the water system itself. Because the direction of influences of the general system variables on each other are still unknown, it is impossible to do much more than identify the two indexes as possible parts of a conveyor belt between systems. Indeed, they apparently screen and constrain inputs in some manner. Yet, how peer communications and management communications link to them and the remainder of the systems is not yet too clear. Is peer discussion, for example, an output rather than an input activity within the water system, or is it an input factor that is screened through the Index of Water Effectiveness, or is it functioning in conjunction with the Effectiveness Index as an input? Too many relationships in the general system are still unknown and the empirically certifiable relationships between the systems as well as within the water system itself are too weak on many scores to permit identification of firm systemic linkages.

On these questions, however, at least two possible routes of exploration are available for discovery. The first involves the manner in which water system variables interrelate, and the second involves probes of possible reasons why the relationships among the water items in the Euphoria sample vary so regularly and determinedly from the other three samples. Not only does Euphoria perform differently from the others on the water variables, but its data perform regularly in the direction opposite the expected while they perform regularly and according to expectations of the traditional literature on S.E.S., general participation, and general attitude variables. Not until one

reaches the water system do the relationships vary regularly in the opposite direction, and then almost all variances are found on the two water system variables which are the more closely associated with the general attitude patterns. Finally, it should be noted that they are precisely the two variables which are the more abstract and the more closely associated with the general system attitudes. Such stern regularities in the deviation pattern call for investigation of underlying forces.

Water System Interrelationships

Basic water system association levels are displayed on Table 13, page 84, and show that certain regular differences emerge between the urban and rural samples as well as between Euphoria and the three other communities. First, the urban samples veer sharply from the rural on four basic relationships, namely uw, ux, wy, and wz. Essentially, a high interest in water and activism in water affairs is associated with negative perceptions of management and its behavior in the urban communities and with more positive perceptions in the rural communities.

Possibly a more significant observation is the regular way in which Euphoria deviates from the pattern established by the other three communities. In six instances Euphoria shows negative association where the others are positive (ew, ex, vw, vx, xy, and xz); and in one instance (vz), Euphoria is positive where the others are negative. In the six cases where Euphoria varies negatively from the rest, the public images of management and its response are involved (x and w). These two variables are positively associated with each other in all communities, including Euphoria. It is reasonable to hypothesize that

perceptions of management have a pronounced effect on other variables in the water system. It is also reasonable to expect that the extent and nature of contact with management or the sources of information about management may be altering relationships. Briefly, how the citizen communicates with his peers and water managers, the information he receives and the perceptions which are generated as a result, could be expected to alter his total field of system perceptions and affect his behavior.

Table 14, page 88, illustrates sharply that persons who communicate with management are assessing the character and quality of management more negatively than those who communicate very little or not at all. Even in Happy Valley, where distributions are insignificant and no one communicates at a high level with management, there are sharp and apparent trends in precisely the same direction as in the other communities. It is also reasonable to expect that varying levels of contact with management, when combined with varying levels of peer communication, are apt to be affecting the management's public image adversely. This is hardly a good omen for management and should be investigated, for if such a tendency is widespread, water managers may be dependent upon low public interest, visibility, and involvement for their professional livelihood. A question to be resolved, therefore, is how communications with one's peers about water and the water system affects the relationship between management communications and the images the public acquires of management and its behavior.

When the overall influence of peer communications is removed (see Table 15, page 89), the relationship between contact with the management and assessment of the management response becomes more positive. Indeed,

Table 14

Input of Positive-Negative Perceptions of Water Managers

Happy Valley

Characterization of Management	Management Communications None	2	3	4	Hi
Lo	7	16	25	0	0
2	32	26	33	0	0
3	48	35	33	0	0
Hi	13	24	8	0	0
Total %	100	101	99	0	0
n	(31)	(89)	(12)	(0)	(0)

$x^2 = 6.264$ (Insignificant)

Farmland

Characterization of Management	Management Communications None	2	3	4	Hi
Lo	3	0	9	11	100
2	29	16	23	22	0
3	39	49	55	44	0
Hi	28	35	14	22	0
Total %	99	100	101	99	100
n	(127)	(71)	(22)	(9)	(3)

$x^2 = 41.893$ ($p < .001$)

Euphoria

Characterization of Management	Management Communications None	2	3	4	Hi
Lo	11	44	17	44	50
2	21	33	20	33	25
3	37	11	46	22	13
Hi	31	11	17	0	13
Total %	100	99	100	99	101
n	(323)	(9)	(41)	(9)	(8)

$x^2 = 43.7750$ ($p < .001$)

Rocky Ridge

Characterization of Management	Management Communications None	2	3	4	Hi
Lo	20	18	44	49	56
2	23	31	23	30	24
3	33	33	21	16	8
Hi	24	18	13	5	12
Total %	100	100	101	100	100
n	(239)	(49)	(48)	(67)	(25)

$x^2 = 56.458$ ($p < .001$)

Table 15

Values of Gamma for Management Response and Management Communications When Controlled for Peer Communications (Controlled Outside Parentheses; Uncontrolled in Parentheses)

Happy Valley	.03 (.02)
Farmland	.64 (.57)
Euphoria	.48 (-.12)
Rocky Ridge	.38 (.33)

the shift in Gamma values for Euphoria is dramatic, which suggests that the extent and manner of communications about water in that community could be causing it to exhibit a pattern of relationships which deviate sharply but regularly from the patterns in the other three communities. Finally, and possibly a most significant observation, is the indication from the data that the relationship between management communications and perceptions of the response pattern tends to be more positive (i.e., the higher the amount of contact, the better the image of management response) when the influence of peer communications is absent. Peer communication cause the associations to be less positive. In fact, in all four communities values move toward zero when peer communications is permitted to vary between the other two.

The regular effects which peer communications have on the association between public perceptions of management and management communications is portrayed on Table 16, page 91. Association between management communication and the public's assessment of management response (z_x) is more positive for the low peer communicators than for the high communicators. If the public communicates with management and reinforces this with peer discussion, the perception of the response is more negative

than if it talks to management but engages in less peer discussion. Table 19, page 96, confirms this. There it will be noted that a lower proportionate balance between peer and management communication produces a more negative image of the response. Management input and control of communication helps the image of management itself.

On the other hand, Table 16, page 91, also shows that association between levels of communication with management and the manner in which the public characterizes management is more positive for high peer communicators than for the low. The pattern is a highly regular one indeed, and it is seemingly contradictory to the earlier findings. When the partials for peer communication are combined with the partials for management communication, as shown in Table 19, page 96, however, the apparent contradiction disappears and the regularized influences of peer input surfaces. Just as in the case of management response evaluations, the evaluations of management general characteristics improve as the proportion of management input to peer input increases, except in one category for the urban communities, where high combined input loadings maintain an exceedingly negative aggregate image of management character. Inspection of Table 20, page 97, reveals that high peer input categories have the highest standards for management of any aggregate grouping for the three communities shown on the table. The combined findings on the several tables indicate that the much lower proportionate loadings of management input in Euphoria is giving a disproportionately high effect to the peer communicators; that this is causing Euphoria to deviate regularly from the other communities on certain scores; and that added contact with management, even in small increments, constrains and regularizes the consequences and

Table 16

Association of Communications with Management and Public Perceptions of Management Controlled for the Influence of Peer Communications

	$F_{zx \cdot y}$		$F_{zw \cdot y}$	
	Low Peer	High Peer	Low Peer	High Peer
Happy Valley	.11	.03	-.25	.04
Farmland	.77	.39	-.29	.08
Euphoria	.66	-.03	-.21	.44
Rocky Ridge	.74	.24	-.25	-.30

Legend:
- w = public's characterization of water management
- x = public expectations of the water management response
- y = peer communications
- z = communications with water management

the influences of peer communication. Tables 15-20 support the further conclusion that peer communications are transporting negative images. Those images improve only as increments of management communication are added to them, despite the very small size of those increments.

Findings thus far also confirm the hypothesis that the significantly associated measures of the public image of management (x and w) are measuring two different things. Moreover, these two measures vary independently of each other in terms of the volume and character of the communication. In fact, it appears that the content of communication may be making a considerable difference. (Note the tendency for Rocky Ridge to veer from the pattern of the other three communities on Table 16.) Due to the type of controversies over water which flared in Rocky Ridge while the team was there, the volume and character of the communication differed from the other communities. No tests could be made for the effect of variations in communication content at the time this report was written. Such tests would have been inadvisable until the search for potential determinants and constraints had been conducted, and until tests had been completed to show their relative strengths.

Table 16, page 91, displays results only for persons who communicate with management. Excluding all persons who have no management input, it dichotomizes the management communicators into low and non-peer talkers vs. high peer talkers. Differential effects of levels of peer communication as they combine with partials of management communication are not discernible from Table 16. Further, loadings for management contact being low (as shown on Table 17, page 93), limit capacity for refined control and analysis, and also preclude measurement of the variable effects of no management contact and accompanying low

Table 17

Comparative Levels of Community Communicators about Water

(in percentages)

Communications with Peers

	High	2	3	None	Total
Happy Valley	6	25	38	31	100%
Farmland	3	13	46	39	101%
Euphoria	2	14	21	62	99%
Rocky Ridge	16	49	19	17	101%

Communications with Management

	High	2	3	4	None	Total
Happy Valley	0	0	9	67	24	100%
Farmland	1	4	10	31	55	101%
Euphoria	1	1	11	3	83	99%
Rocky Ridge	1	4	27	11	56	99%

visibility, information voids, and irrelevance of water and its issues. Persons with low visibility and little or no knowledge of the system are a part of the system. Certain incidents, and surely crises situations, may stimulate them to act. When they act, they will do it on some basis which involves their perceptions of their environment. No matter how skewed these perceptions may be and no matter how far they may deviate from reality, these perceptions are likely to be employed when something arises suddenly. Therefore, they should be known and the persons possessing them should be compared with other classifications of perceptions and related behavior.

Analysis up to this point indicates that communications, even sheer volume of it, has a constraining effect upon the rest of the system. If the constraining effect of communications factors on the water system is as strong as indicated, then regular variances by level and type of communications should produce regular differences in the characteristic functions of other water system variables across the sample. So that the reader can observe effects more readily with the naked eye, Table 18, page 95, shows that proportionate loadings for perceptions by community, and Tables 19 and 20, pages 96 and 97, specify the proportionate effects of communications on the public perceptions of management. Table 19 contains a wealth of significant information about publics and their water systems, namely:

1. Public perceptions of the response are regularly negative in the three communities according to the level and type of communication.

2. The volume of communications appears to account for the degree of satisfaction with management's response.

3. When communications are very low or non-existent, the perceptions in all communities are similar. The rural-urban and private-public distinctions appear to have

Table 18

Comparative Community Perceptions of Water Management: In Percentages

Public Expectations of Water Management Capabilities and Effectiveness

	High	2	3	Low	Total
Happy Valley	31	36	26	7	100%
Farmland	10	43	32	14	99%
Euphoria	11	25	33	31	100%
Rocky Ridge	27	33	26	15	101%

Perception of the Quality and Character of the Functioning Water Management

	High	2	3	Low	Total
Happy Valley	20	38	28	14	100%
Farmland	29	44	24	4	101%
Euphoria	28	36	22	14	100%
Rocky Ridge	18	28	25	29	100%

Perception of the Quality of Responses of Water Management

	High	2	3	Low	Total
Happy Valley	7	2	66	25	100%
Farmland	13	6	60	21	100%
Euphoria	2	2	65	31	100%
Rocky Ridge	5	7	49	39	100%

Table 19

Display of Variable Effects Between Communications and Images of Management: In Percentages

		Input on Both High	Input on Both Low	No Input	High Peer-Low Management Input	High Management-Low Peer Input
IMAGE OF MANAGEMENT'S RESPONSE	Farmland					
	Negative	31	81	97	73	39
	Positive	59	19	3	27	61
	N =	(13)	(103)	(67)	(22)	(18)
	Euphoria					
	Negative	80	87	100	98	100
	Positive	20	13	0	2	0
	N =	(15)	(86)	(238)	(49)	(2)
	Rocky Ridge					
	Negative	71	87	98	93	88
	Positive	29	13	2	7	12
	N =	(83)	(79)	(64)	(195)	(8)
PERCEPTION OF MANAGEMENT'S CHARACTER AND QUALITY	Farmland					
	Negative	20	23	32	23	44
	Positive	80	77	68	77	56
	N =	(14)	(106)	(69)	(22)	(18)
	Euphoria					
	Negative	80	33	30	57	50
	Positive	20	67	70	43	50
	N =	(15)	(86)	(238)	(49)	(2)
	Rocky Ridge					
	Negative	81	29	36	58	75
	Positive	19	71	74	42	25
	N =	(83)	(79)	(64)	(195)	(8)

Table 20

Levels of Standards and Expectations for Each Level and Type of Communication Input:

In Percentages

LEVEL OF PUBLIC STANDARDS AND EXPECTATIONS	Input on Both High	Input on Both Low	No Input	High Peer-Low Management Input	High Management-Low Peer Input
Farmland					
Low	36	45	46	55	50
High	64	55	54	45	50
N =	(14)	(105)	(69)	(22)	(18)
Euphoria					
Low	20	59	73	39	50
High	80	41	27	61	50
N =	(15)	(86)	(238)	(49)	(2)
Rocky Ridge					
Low	46	46	53	32	50
High	54	54	47	68	50
N =	(83)	(79)	(64)	(195)	(8)

little or no effect. Note the uniformity in proportions across all communities on both images.

4. As input rises, the images of management response improves. The slightest bit of communication begins affecting the image.

5. Management input appears to have more effect on the image of management response than does peer input; but peer input appears essential for the stimulation of management input.

6. However, the greatest improvement in perception of response occurs when the two types are mutually re-enforcing.

7. The image is further augmented when the volume of mutually reinforced input is increased.

8. High peer communications apparently does not affect or change appreciably the negative perception of the response pattern unless it is joined by management input.

9. Hence, again, the low proportionate peer input loadings in Euphoria, provided with an extremely low amount of reinforcement from management input, skew the internal system relationships in that community as was seen earlier in this chapter.

10. Perceptions of the response and public characterization of management, though positively related, are being pushed in different directions in terms of the volume and type of input. Low and non-discussants have a positive characterization of the management. A high volume of unreinforced (by management input) peer input tends to worsen the public's picture of management generally, except in the rural community where public standards for and expectations of management are lower (see Table 20, page 97).

11. Mutual reinforcement of the input variables serves only to heighten the above trends seen in the high peer input-low management input categories on each community. The rural community's image improves as communications volume rises and the urban communities acquire a decidedly more negative image. Thus, the communications variables still display their capacity to constrain others, and their mutual reinforcement effects are still present.

12. Where standards and expectations are low (see Table 20, page 97), communications tends to produce a more positive characterization of the management; where they are high, communications apparently produce a more negative characterization as the volume increases.

13. Where no input exists, general standards and expectations appear, at least, to be playing a very small role. As Euphoria, the low input community, demonstrates, persons apparently have little or no basis upon which to evaluate, judge, or direct a response. It is reasonable to hypothesize that such persons, given their information vacuum, will respond on the basis of the immediate event and the way that event confronts whatever ideological perspective they possess at the moment of confrontation.

14. Both Tables 19 and 20 point up the importance of communications information input for management. They further single out communications factors and models as important instruments for measuring the functioning relationships in a water system.

15. Where mutually reinforced inputs are high, standards and expectations are also high; but high peer communication input also accompanies higher standards in all communities, yet is less pronounced in the rural communities. Hence, the more persons communicate, the higher their standards and expectations. Note that standards and expectations rise with increased input and that reinforcement is apparently not as important for standards as it is for the image of management response.

It is vital to see that standards for judgment heighten as communications volume increases. There is evidently information, whether positive or negative, good or bad, flowing in the system, which people are using for worse or for better; but it seemingly fails to have much support either from within or without the system. Though significant, the associations between externalities and inputs to the system are low, as indicated in earlier tables, and even associations within the system, though significant, are not exceedingly strong, except at the input end where feedback, in lieu of support outside the system, must generate movement.

The findings may not bode well for water managers; and management may not be able to do much about their plight because the system appears to lack a self starter. Interest in water appears to be a necessary stimulant to a positive input; but, as seen earlier, its influence fades

as it moves away from the input end of the system. Contact with management obviously improves the public image of the agencies; but, there is really little assurance of a positive effect unless it is high enough to affect accompanying peer communication. High peer communication appears to depend upon high interest (which is fragile and fades easily) or on being disturbed by effects of the system which can be ominous. Though significant at times, associations of external social system variables to water system variables are modest at best. This leaves the system largely dependent on its own feedback to stir input and activity. That feedback obviously carries high loadings of negative attitudes toward management, which must be transported by peer communication that has little positive effect until management input reaches it. Stirring of interest will undoubtedly be colored by the transportation of negative images. In brief, the system simply will not wind up. (Unfortunately, Americans tend to over-report their levels of interest because they are culturally cued to be interested. Our data indicated a heavy over-reporting, which makes this variable a little suspect.)

Whatever other influences may be present, communications variables obviously comprise constraints to the four water systems under observation and the communications network is a locus for trafficking other variables in the system. As a matter of fact, the team could locate no other variables which displayed so much power. For example, these are the variables which apparently explain the regular deviancy of Euphoria from the patterns established by the other three communities. Note that Euphoria performs in the same manner as the other communities on $\underline{x}$ when peer communications are not permitted to vary (see Table 16, page 91). Euphoria regularizes and returns to the established patterns.

The major conclusion drawn from the data at this point in the research is that the public's communications network comprises a stern parameter to a water system. The constraining effects now appear clear enough to hypothesize that most any internal system relationship will be affected by the network and its characteristics.

The internal system loadings on v, w, and x for all communities are displayed on Table 18, page 95, and these tables definitely illustrate the earlier point that a considerable number of people register negative reactions to agency responses while clinging to positive views of the management's quality and character. This is especially true in Euphoria where practically everyone is dissatisfied with agency responses and communications loadings are light. As shown on Table 18, all communities, even Farmland, display a high level of dissatisfaction with the response. In Euphoria, those who hold high standards for management (v) have the most negative view of the response (x) (-.52 Gamma); and they feel the most effective in the water system (γ_{ve} of .39). They also engage peers in discussion about water and the agency far more (γ_{vy} of .39). Again, it appears that disproportionate loadings are having their effect and turning Euphoria around in a regular manner.

If y is partialled on vx in Euphoria, the peer talkers with high standards are extremely negative. The γ_{vx} for high peer communicators is -.71 and it is a -.29 for the low and non-peer communicators. High standards may be functioning with peer communication to make perceptions more negative. If the level of standards are controlled, then persons with high standards show a pronounced tendency to have negative views if they are high talkers and positive views if they are low talkers (γ -.63); but the opposite is true for persons with low standards. High

peer communicators will tend to be somewhat positive while low and non-talkers are the more negative (γ .17). However, in Euphoria, too, (see Table 13, page 84) those who come in contact with management are less inclined toward a negative view of management than those who do not contact management and confine their discussion and contact about water to their peers (γ_{xy} of -.48 as compared to a γ_{xz} of -.12). Thus, advantage accrues to the agency when it can get contact and thereby constrain the peer input.

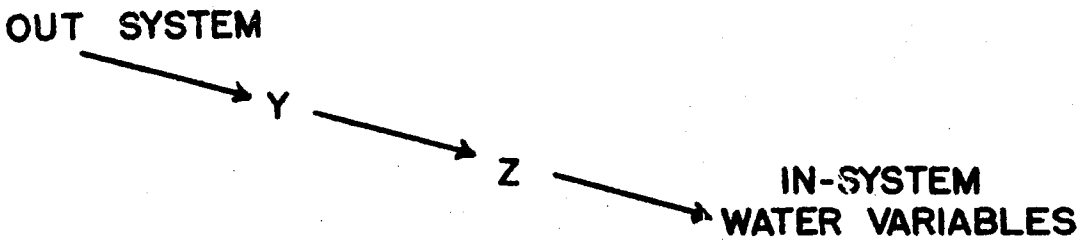
A similar pattern tends to exist in Rocky Ridge where x and y are unassociated (have a Gamma near zero) while x and z are significantly and positively associated. Contact with management improves management's situation some with its public, although each agency still has a problem of acquiring a poor overall evaluation of its response as a result of its contact with the public. Apparently, too, as Tables 18 and 19 indicate, a high volume of peer discussion accompanied by a low volune of discussion with agency officials is apt to be unsettling, if not threatening. Again in Rocky Ridge, as in Euphoria, it is the influence of communication volume (and content, if it were indexed and could be measured at this time) that seemingly makes the greater difference. When the influence of y is withdrawn from the vx association, the Gamma value moves regularly toward zero. For the low communicators the association of v and x is .39 while it is only .17 for the high communicators. Thus, when peer input controls are asserted on vx associations in the two communities, they respond in a similar manner despite the regular deviances displayed by Euphoria on the raw association scores. Such regularities suggest that a system may indeed be functioning.

Certain observations are in order at this point. Certainly water questions and issues are not the most exciting and stimulating ones, even in a period when environmental issues have loomed large nationally and internationally. The probability is good, therefore, that persons whose interest is stirred and who enter the discussant ranks are likely to become excited by some adverse consequence that they perceive. The prospects seem good that they are motivated by something that generates negative views and even hostility before they act. Many persons are doubtlessly angry before they go to the trouble of contacting management or attending meetings or talking to the neighbor. If this is true, then the data show that contact and experience with management will mitigate that some.

Exercises in Modeling

Previous analysis indicates the existence of system relationships. To begin with, re-examination of Tables 10, 11, 12, and 13 shows that peer communication (y) tends to be more closely associated with external system variables than is management communication (z). This is true in the two sharply contrasting communities. Variable y intervenes sharply between external variables and water system components on a number of controlled tests not displayed here. On the other hand, variable z, communication with management, is somewhat more closely associated with water system variables than is y (peer communication) and latter tables show that it constrains the effect of y on the internal system when its loadings are more than minimal proportionately. On the two communities, Rocky Ridge and Euphoria, which contrast the most sharply in rate of communications input and, therefore, should

provide the best reading of the power of communications variables, z is slightly more closely associated with e and x than is y. It is certainly more closely associated than y with v and w. So, the input end of the system can probably be represented as follows:



Some Additional Theoretical Considerations

Any attempt to develop a model or models should allow for the gross character of the data. Despite the great pains taken to make this data representative and the meticulous insistence on accuracy, the data reads reality through thick lenses. The indexes certainly measure what they purport to measure, but they are not finely honed tools.

A major pitfall of much social science involves the application of highly refined and exacting or very demanding mathematical and statistical devices to data that is quickly and economically collected, but hardly capable of having heavy demands made on it. Overdependence on highly refined techniques of scientific analysis will not bail a person out of his imprisonment with gross data. The logical answer to the problems of gross data is the expenditure of human effort, time, and money to obtain data that is less gross.

In view of the unquestionably gross characteristics of the data, then, it appears to be propituous to relax the severe demands on mathematical and statistical theory on the one side, and to forego some of the requests of social theory on the other. Crude data probably calls

for crude tools in social science just as it did in the post-Renaissance hard sciences. Briefly, explanatory power acretes slowly through the development and refinement of data collection as well as the analytical tools. As the reader has already seen, a rather heavily laden design of multivariate analysis was developed and used. The primary measures were Gamma (γ) for level of association and Chi Square (X^2) for levels of significance. The theory underlying the effects of their applications to social data has never been fully elaborated or understood, since a great deal remains to be learned about the characteristics of social data themselves. According to Goodman, Gamma (γ) is a measure of association and can be used to measure the degree to which one variable intervenes to affect the relationship between two others.[13]

Such controls are very valuable measuring devices, yet, peculiar characteristics of social data frequently leave the investigator puzzling as to whether any movement toward zero was really due to the removal of an influence. This is why a multivariate comparison across several sets of like data may be useful. It is also why some of the theoretical demands for precise discrimination and measurement probably should be relaxed in favor of a search for indicators, trends, and crude uniformities.

Toward a Model of the Water Sub-System

The analysis thus far has surfaced some indicative characteristics and trends. Table 12, pages 81 and 82, indicates that perceptions of management's character and quality are the least influenced of all water system variables by exogenous factors outside the system. More recent tables have identified variables which appear to channel and constrain

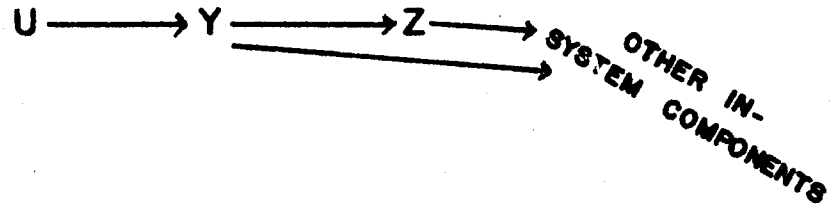
the way people respond to water systems. Communications variables and expectations and standards are two of these. Logic would indicate that such variables are somewhat close to the input end of the system.

Next, it will be recalled that w (public appraisal of management's character and competence) appeared to be the most shielded or immune to influence from outside the system (see Table 13, page 84). It is reasonable to hypothesize that w is quite far removed from the input end of the water sub-system, if such a system really exists. Most of the outside influences may have been screened out by other system variables before w is reached. Everything thus far may provide some notion about location of w in the system as well as the direction in which influences may be flowing within the system itself.

For future research purposes, it is cautiously hypothesized that the communications variables are input valves to the system. Certainly, there may be many others. They seem to be closely associated and it is suggested, that despite the degree of independence, they work in tandem. There is every indication, however, that z is closer to the water sub-system variables as a whole than is y. In this regard, there may be a direct flow to the system from y to z.

In one case, at least, that of Euphoria, it is almost certain that a person is a peer communicator if he is a management communicator. The reverse, of course, is not true. Nevertheless, there are indications that other input valves exist and a good deal of input to the system comes by tracks other than the communications network.

A most interesting variable is declared interest in water (u). This variable appears to be closely associated with the input valves, z and y, but shows little association to system components beyond that point. Table 13, page 84, illustrates its tendency to be more closely associated with y than z on three of the four samples. Tests not shown indicate that y disturbs its association with z. Therefore, the hypothesized model now might appear as follows.



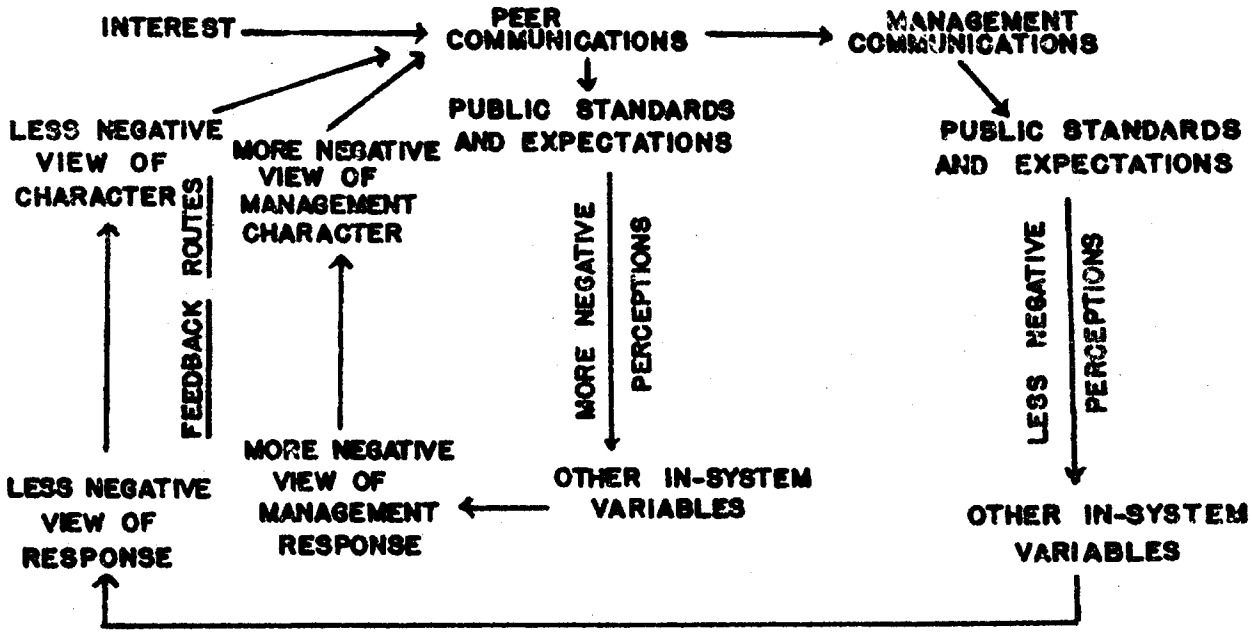
Attempts to model beyond this point encounter certain difficulties that are peculiar to social data generally, and to the study data in particular. First, social variables tend to have highly pliant characteristics. One variable may have a uniform and significant strength of association with another variable over time, yet this does not characterize the association sufficiently. An association may remain strong and significant for a long time while other characteristics of associated variables and their conformation may undergo wild changes within short spans of time, yet the strength of the association may vary little. This does not diminish the importance of the strength and significance of the association, but it does pose a need to know other characteristics and how they exert influence, as well as the need to know more about the character of the association itself. Not enough is yet known as to how particular social variables function together in the context of other influences from both exogenous and endogenous elements to the system.

Many social variables, or those used in social analysis, have a remarkable capacity to expand and contract very rapidly. To borrow some social theory from John Dewey,[14] for example, persons who respond to their cultural and physical environment in terms of consequences they perceive, may have those perceptions of consequences expand and contract markedly within short spans of time. A sanction may loom large and be very constraining immediately after it has been applied, but within hours its constraining capability may have diminished appreciably. This pliancy apparently makes it possible for one variable to have its influence and constraining effect substituted for another. Putting this in another way, the association levels among three variables may remain the same, but the space they occupy within each other's realm may shift markedly in a short space of time. Variables change places and shift around. In certain instances, what is frequently conceptualized as interaction may not be that at all. It depends on the characteristics of the shifts as well as characteristics of the variables themselves and the association. Therefore, even as the weight of influence among certain water system variables on each other remains relatively the same, the weight of influence shifts around through time and also as the characteristics of the communities, agencies, and publics change. This, however, does not diminish the importance of knowing the strength of an association

The pathing model which follows is hypothetical; however, tests throughout the research indicate that, given normal everyday sequences of events, the model probably comes close to a portrayal of reality. Interest in water will spur communications, but its effect on management communications will be constrained by peer communications to some

extent. Contact with the management will constrain its effect on other system variables considerably if it reaches management input. Its major outlet, however, is peer input where it evidently spurs volume. If peer input bypasses management input, judgments will be more negative. If management input and contact are stimulated, they affect the character of peer input and constrain its effects evidently. Where both types of input are muted, persons apparently resort to standards and expectations they have acquired through experience with their environments for passing judgments. Where both types of input reinforce each other, the relationship between standards and evaluations of management's character strengthens. The higher the reinforced input in public segments where input is markedly low, then the greater the probability that high standards will produce negative images; and in every case where no input occurs, high standards show a high probability of producing negative images. Although high standards tend to be more scarce among the non-input people, those that have them use them and that use comes at no advantage to management.

The following pathing model apparently makes some empirical sense:



Conclusion

Parameters to systems are identifiable characteristics with measurable effects which vary regularly with the circumstances of their application. Once specified, their effects can be predicted with great accuracy rather than merely estimated. The constraining effects of the human communications networks on water system variables are exceedingly regular. Although the analysis remained consistent in its dependence on a tool for estimation, the regularities in the results strongly indicate that further refinement of the communications indices stand an excellent chance of yielding an identifiable characteristic that would vary regularly with the circumstances of its application. Certain findings from the research not shown here indicate that the same type of regularities noted previously on selected water system variables are also being exerted on other variables. For example, tests for effects of communication on a sense of efficacy in the water system and other variables lead to the same sort of results observed earlier in such tables as #19 and #15. As this is being written, a research assistant has noted similar effects of a regular type on variables not even considered in this report.

The effects of the human communications network are so regular and so discernible that they should definitely not be excluded from future study efforts. The measures of communication must be refined however; for there is every indication that the ones in this report are too crude, despite their excellent performance across the four samples.

Also, there is every indication that water agencies and their personnel would benefit greatly from efforts they might make to have greater contact with their publics. Contact helps their image. The

shocking revelation of this research was the proportion of negative perceptions held by the members of the public in both the ranks of the knowledgeable and the uninformed. A person had to have an extremely severe assessment of the management to end up in the low end of the indexes of management response and management character. Yet, a virtual tidal wave of people did so.

Further, this research indicates that large portions of the public treat local systems and local issues in a manner that is considerably independent of national systems and national issues. And finally, an agency's image cannot be treated as a compact whole, rather it must be treated as it is in reality, a large number of distinct factors which relate to each other, but also maintain a good deal of independence from each other and exert different types of influence on the total system. Those images are, after all, the picture the citizen has of the agency, and there is every indication that the citizen uses them when he responds.

ENDNOTES

Chapter I

[1]See, S. V. Ciriacy-Wantrup, Conservation, Economics and Policies (Berkeley: University of California, 1963); I. K. Fox and O. C. Herfindahl, "Attainment of Efficiency in Satisfying Demands for Water Resources," American Economic Review, Vol. 54 (1964); R. E. Clark, "Groundwater Management: Law and Local Response," Arizona Law Review, Vol. 6 (Spring, 1965); Hans Lundberg, et al., Resources in America's Future (Baltimore: The Johns Hopkins University Press, 1963); William E. Warne, "The Water Crisis is Present," Natural Resources Journal, Vol. 9, (1969); Gilbert White (ed.), Water, Health, and Society (Bloomington: University of Indiana Press, 1965); and J. Wright, The Coming Water Famine (New York: Coward-McCann, 1966) for somewhat typical treatments of this set of problems.

[2]See, Raymond L. Anderson, "Emerging Nonirrigation Demands for Water," Agricultural Economics Research, Vol. 17 (October, 1965); Edward H. Bryan, "Water Supply and Pollution Control Aspects of Urbanization," Law and Contemporary Problems, Vol. 30, (Winter, 1965); G. W. Hart, "Creative Federalism: Recent Trends in Regional Water Resources Planning and Development," University of Colorado Law Review, Vol. 39, (Fall, 1966); Allen V. Kneese and B. T. Bower, Managing Water Quality (Baltimore: The Johns Hopkins University Press, 1968); D. F. Metzler, "Planning for State Water Resources Administration," American Water Works Association Journal, Vol. 59, (July, 1966); and Joseph J. Spengler, "Megalopolis: Resource Conserver or Resource Waster?" Natural Resources Journal, Vol. 7, (July, 1967) for discussions of these developments.

[3]See, Alternatives in Water Management, (Washington, D. C.: National Research Council of National Academy of Sciences, 1966), pp. 37-38 for a discussion of the importance of local water distributors in total water systems. Also see, Vincent Ostrom, "The Water Economy and its Organization," Natural Resources Journal, Vol. 2, (April, 1962) and Gilbert White, "Formation and Role of Public Attitudes," in Environmental Quality in a Growing Economy (Resources for the Future, 1966).

[4]See, K. Lewin, "Frontiers in Group Dynamics," and "Constructs in Field Theory," in D. Cartwright (ed.), Field Theory in Social Science (New York: Harper, 1951); and "Field Theory and Experiment in Social Psychology: Concepts and Methods," American Journal of Sociology, Vol. 44, (November, 1939) for discussion of this conceptualization.

Chapter II

[1]The Farmland sample includes users from two different local water agencies. One of the agencies is a mutual water company and the other is a water district. They are combined and treated as a single community throughout most of this study. However, they are treated as separate units in Chapter III in which the data is examined to determine if the public-private distinction has substantive effect upon water related attitudes.

[2]See, David Easton, The Political System (New York: Alfred A. Knopf, 1953) and A Systems Analysis of Political Life (New York: John Wiley and Sons, 1965) for a discussion of the allocation of values as the core of the political system. Cf. Harold D. Lasswell and Abraham Kaplan, Power and Society: A Framework for Political Inquiry (New Haven: Yale University Press, 1950).

[3]See, Bernard R. Berelson, Paul F. Lazarsfeld, and William N. McPhee, Voting (Chicago: University of Chicago Press, 1954); Alvin Boskoff and Harmon Zeigler, Voting Patterns in a Local Election (Philadelphia: Lippencott, 1964); Angus Campbell, Phillip Converse, Warren Miller, and Donald Stokes, The American Voter (New York: John Wiley and Sons, 1960); Heinz Eulau, Class and Party in the Eisenhower Years (New York: The Free Press, 1962); J. M. Foskett, "Social Structure and Social Participation," American Sociological Review, Vol. 20, (August, 1955); Robert E. Lane, Political Life: Why People Get Involved in Politics (Glencoe: The Free Press, 1959); Paul F. Lazarsfeld, Bernard Berelson, and Hazel Gaudel, The People's Choice (New York: Duell, Sloan, and Pearce, 1948); Warren E. Miller, "The Socio-Economic Analysis of Political Behavior," Midwest Journal of Political Science, Vol. 2, (August, 1958); and Edward A. Suchman and Herbert Menzel, "The Interplay of Demographic and Psychological Variables in the Analysis of Voting Surveys," in Paul Lazarsfeld and Morris Rosenberg (eds.), The Language of Social Research (Glencoe: The Free Press, 1965) for discussions of the influence of social-economic variables upon political behavior.

[4]The income distributions in Farmland may in part result from the propensity of many farmers to relate gross rather than net income and conversely a tendency to underestimate actual income.

[5]Particularly, see, Angus Campbell, Phillip Converse, Warren Miller, and Donald Stokes, The American Voter (New York: John Wiley and Sons, 1960); Angus Campbell, Gerald Gurin, and Warren Miller, The Voter Decides (Evanston: Row, Peterson, 1954); and Lester W. Milbrath, Political Participation (Chicago: Rand McNally, 1965) for discussion of the role of these political variables in political behavior.

Chapter III

NONE

Chapter IV

[1]See, Phillip E. Converse, "The Nature of Belief Systems in Mass Publics," in David Apter, (ed.), Ideology and Discontent (New York: The Free Press, 1964), pp. 206-62; K. Lewin, "Frontiers in Group Dynamics," and "Constructs in Field Theory," in D. Cartwright (ed.), Field Theory in Social Science (New York: Harper, 1951); and Norman R. Luttbeg (ed.), Public Opinion and Public Policy (Homewood, Illinois: The Dorsey Press, 1968).

[2]Cf. Luttbeg, op. cit., pp. 1-9.

[3]See, Leo A. Goodman and William H. Kruskal, "Measures of Association for Cross Classifications," Journal of the American Statistical Association, Vol. 49, (1954), pp. 732-64; and Leo A. Goodman and William H. Kruskal, "Measures of Association for Cross Classifications," Journal of the American Statistical Association, Vol. 58, (1963), pp. 310-55, for discussions of the use of Gamma as a measure of association. See, Fred N. Kerlinger, Foundations of Behavioral Research (New York: Holt, Rinehart, and Winston, 1964), pp. 151-55; John H. Mueller and Karl F. Schuessler, Statistical Reasoning in Sociology (Boston: Houghton Mifflin Company, 1961), pp. 262-64; and Dennis J. Palumbo, Statistics in Political and Behavioral Science (New York: Appleton-Century-Crofts, 1969), pp. 148-56, for treatments of the use of Chi Square test.

[4]The index includes six items which identify the extent to which the respondent discusses local government or community matters, the degree to which he has taken an active part in community issues and whether he voted in the last community election.

[5]See, Angus Campbell, Gerald Gurin and Warren E. Miller, The Voter Decides (Evanston, Illinois: Row, Peterson, and Company, 1956), pp. 187-93, for a discussion of this scale.

[6]See, Ulf Himmelstrand, Social Pressures, Attitudes and Democratic Processes (Stockholm: Almgvist and Wiksell, 1960), pp. 166-69, for a discussion of this measure.

[7]See, Himmelstrand, op. cit., pp. 202-04, for a discussion of this measure.

[8]See, Robert E. Agger, Marshall N. Goldstein, and Stanley A. Pearl, "Political Cynicism: Measurement and Meaning," Journal of Politics, Vol. 23, (August, 1961), pp. 477-506, for a discussion of this measure.

[9]This scale is designed to identify generalized attitudes toward social change including support for and rejection of alternatives to the present state of affairs.

[10]See, Leo Srole, "Social Integration and Certain Corollaries: An Exploratory Study," American Sociological Review, Vol. 21, (December, 1956), pp. 709-16, for a discussion of this measure.

[11]This scale was developed by our late colleague Charles L. Garrison to identify generalized support for and rejection of increased taxation.

[12]See, particularly, Bernard R. Berelson, Paul F. Lazarsfeld, and William N. McPhee, Voting (Chicago: University of Chicago Press, 1954), for extensive treatment of these variables. Cf. Phillip E. Converse, "The Nature of Belief Systems in Mass Publics," in David Apter, (ed.), Ideology and Discontent (New York: The Free Press, 1964), pp. 206-62, for an example of the limitations of these variables.

[13]See, Goodman and Kruskal, op. cit.

[14]See, John Dewey, The Public and Its Problems (New York: Henry Holts and Company, 1927).