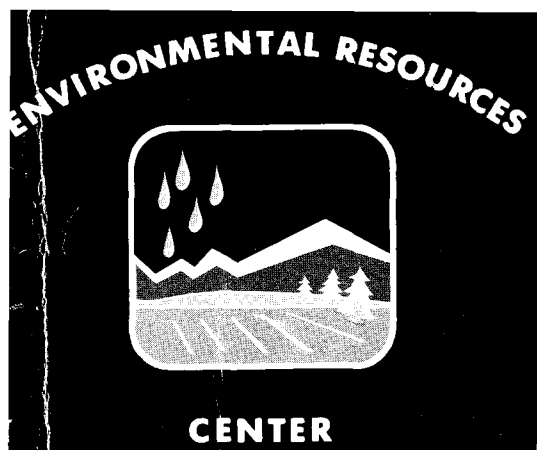


**LOCAL WATER AGENCIES,
COMMUNICATION PATTERNS,
AND THE PLANNING PROCESS**

by
R. L. Meek

September 1971



**Colorado State University
Fort Collins, Colorado**

**Completion Report Series
No. 27**

LOCAL WATER AGENCIES, COMMUNICATIONS
PATTERNS AND THE PLANNING PROCESS

Completion Report

OWRR Project B-051-COLO

September 30, 1971

by

Duane W. Hill and R. L. Meek
Department of Political Science
Colorado State University

submitted to

Office of Water Resources Research
U. S. Department of Interior
Washington, D. C.

The work upon which this report is based was supported (in part) by funds provided by the United States Department of the Interior, Office of Water Resources Research, as authorized by the Water Resources Research Act of 1964, and pursuant to Grant Agreement No. 14-31-0001-3067.

Colorado Water Resources Research Institute
Colorado State University
Fort Collins, Colorado

Norman A. Evans, Director

ABSTRACT

LOCAL WATER AGENCIES, COMMUNICATIONS PATTERNS AND THE PLANNING PROCESS

The planning activities of local water distribution agencies are significant components of the local water resource system. This research examines these activities through the use of interviews with the planning agents in a sample of agency planners in a seven county region in Colorado. Similarly, interviews were conducted with a set of planning influentials with whom the planners communicate.

The data indicate that there is broad support for long-range, effective planning throughout the system. Planning activities are carried out in the local water agencies, but these activities tend to be short-range and are designed to deal with immediate problems of an operational nature. The typical agency planner spends a very small proportion of his time directly engaged in planning activities. They are generally persons with little specialized training in the techniques and problems of planning and they perform a number of other roles within the agency.

The communications system which links together the different actors relevant to local planning efforts is seemingly quite adequate to diffuse necessary information throughout the system. However, there is little evidence that this system operates to effectively coordinate the activities of the different agencies within and between the sectors of the system. The general water resource system of the area has developed around the needs and interests of the irrigation sector and it tends to reflect the concerns of this sector. Irrigation interests tend to assume a defensive position designed to maintain the present system and domestic agencies assume a more aggressive position oriented toward bringing about change in the system. Therefore, planning activities are more intense in the domestic sector. The integration which is needed for more effective utilization of water and more effective planning is retarded by the present organizational and attitudinal configurations that are present in the system.

Hill, Duane W. and Meek, R. L.

LOCAL WATER AGENCIES, COMMUNICATIONS PATTERNS AND THE PLANNING PROCESS
Completion Report to the Office of Water Resources Research, Department
of the Interior, September 1971, Washington, D.C.

KEYWORDS--administration/constraints/*decision-making/formulation/institutional constraints/*institutions/local governments/*methodology/*non-structural alternatives/*planning/*rural areas

TABLE OF CONTENTS

<u>Chapter</u>	<u>Page</u>
I. PLANNING AND LOCAL WATER AGENCIES	1
A. <u>Introduction</u>	1
B. <u>The Nature of Planning</u>	3
C. <u>Local Water Agencies</u>	7
D. <u>Objectives of this Study</u>	8
E. <u>Scope of the Study</u>	10
1. The Samples	11
2. The Interviews	14
F. <u>Design for Analysis</u>	15
1. Personal Attributes	17
2. Organizational Attributes	18
3. Extra-organizational Context	19
4. Local Water Planning System	20
G. <u>Summary</u>	21
II. THE LOCAL AGENCY PLANNER	22
A. <u>Background Characteristics</u>	22
B. <u>Occupational Orientations</u>	26
C. <u>Water Resource Policy Orientations</u>	29
D. <u>Planning Orientations</u>	30
E. <u>Perceptions and the Planning Process</u>	33
F. <u>Summary and Conclusions</u>	36
III. ORGANIZATIONAL CHARACTERISTICS AND THE PLANNING PROCESS	38
A. <u>Agency Characteristics</u>	39
B. <u>Agency Planning Activities</u>	44
C. <u>Communications Patterns and Planning Activities</u>	50
D. <u>Summary and Conclusions</u>	55
IV. EXTRA-ORGANIZATIONAL CONTEXT OF WATER AGENCY PLANNING	57
A. <u>Perceptions of Planners</u>	58
B. <u>Communications Linkages</u>	68
C. <u>"Influentials" and the Local Planning System</u>	73
D. <u>Summary and Conclusions</u>	80

<u>Chapter</u>		<u>Page</u>
V.	COMMUNICATIONS PATTERNS AND THE LOCAL WATER PLANNING SYSTEM	82
	A. <u>Communication Patterns and Authority Structures</u> . . .	84
	B. <u>Leadership Orientations</u>	94
	C. <u>Attitudes of Influentials</u>	100
	D. <u>Summary and Conclusions</u>	102
VI.	SUMMARY OF FINDINGS	109
	A. <u>Conclusions</u>	117
	ENDNOTES	121

LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
1	Flow of Effects in a Local Water Planning System	16
2	Sociogram of Linkages Among Most Frequent Nominees in Local Planning Communications Systems	88

LIST OF TABLES

<u>Table</u>	<u>Page</u>
1 Service Area of Irrigation Organizations: By Size of Organization	12
2 Service Areas of Domestic Water Organizations: By Size of Organization	12
3 Intensity of Support for Planning	41
4 Index of Personal Effectiveness	42
5 Expectations of Agency Growth	43
6 Proportion of Time Devoted to Planning Activities	45
7 Budget Allocations for Planning Activities	46
8 Time Periods Considered in Planning	47
9 Periods Receiving most Attention in Planning	47
10 Rankings of Significant Future Problems of Agencies . . .	49
11 There are too many Experts Trying to Solve Water Problems	51
12 It is Wasteful to Use Outside Consultants	52
13 Discussion of Agency Problems with Users	53
14 Impact of Urbanization on the Water Organization	59
15 Support for the Regulation of Urban Growth to Preserve Farmers' Water	60
16 Other Agencies are Changing so Fast That Real Problems will Result	61
17 Maintenance of the Agency's Water Rights is a Significant Problem	62
18 Prior Appropriation Doctrine has Outlived its Usefulness	62
19 More Money is the Answer to Nearly Every Agency Problem	64

<u>Table</u>		<u>Page</u>
20	Less Government Regulation and More Private Enterprise is Needed	64
21	Importance of Ideas of General Public in Planning	65
22	Expected Ranking of Problems by General Public	66
23	Level of Communication with Irrigation System	69
24	Level of Communication with Domestic System	70
25	Communications with Users	71
26	Communications with Local Officials	72
27	Communications with State Officials	72
28	Rankings of Future Problems	76
29	Rankings of Barriers to Effective Planning	78
30	Relationship between Number of Times of Nomination and Source of Nomination	85
31	Relationship between Number of Nominations and Frequency of Communications	89
32	Role Played in Planning Processes	95
33	Adequacy of Planning Activities	98
34	Role Played in Water Planning Activities	102
35	Adequacy of Water Planning	103

Chapter I

PLANNING AND LOCAL WATER AGENCIES

Introduction

There is growing evidence that there is an emergent water crisis in the United States. The system through which water resources are developed, allocated, and utilized is being placed under extreme stress. The goal of providing adequate supplies of usable water to meet the growing domestic, industrial, irrigation, and recreational needs of the country is becoming ever more difficult and costly to achieve.¹ Although the present state of affairs in the water system is a difficult one in many areas, the projections of future supplies of and needs for water resources indicate that present problems will be greatly intensified in the next decades. One typical expectation is that,

Before the end of the century, it is estimated that daily consumption for all purposes will exceed the usable supply.²

Expected patterns of population growth and industrial expansion and the necessarily increased demands for food and fiber to support these developments simultaneously expand the need for water resources and present threats to the quality of available water supplies. If adequate supplies of water of an acceptable quality are to be available to meet the needs of the society, there must be more effective means developed for the more efficient development, preservation, and utilization of the limited water resources of the country.

One of the significant barriers to the development of effective responses to the emergent water crisis results from the nature of the

water resource management system in the United States. This system is marked by a set of highly complex and fragmented institutions which make the task of coordination and integration of water policies and programs quite difficult.³ The total pattern of water allocation in the United States is accomplished through a multiplicity of decisions of thousands of private and public water agencies who deliver water to domestic, agricultural, and industrial consumers.⁴ Similarly, the quality of the water supply is largely determined by the content of innumerable independent decisions involving the disposal of waste arrived at by municipalities, industrial plants, agricultural producers, and private individuals. Although a substantial portion of the elements of the hydrologic system are highly interdependent, the basic points of the social decision process are insufficiently coordinated for optimal protection and utilization of the physical resources of the water system. Therefore, the total pattern of water utilization tends to be determined by the additive outcome of uncoordinated decisions which results in a state of affairs that was not chosen by anyone.⁵ The extent to which the pattern matches articulated societal goals is largely a matter of chance having been produced by a fragmented and uncoordinated set of decisional structures.

The limited mechanisms that have been developed for the coordination of the social and management aspects of the system are embedded in generally fragmented national governmental policies, state water plans and regulations, and in the documents related to attempts to design comprehensive plans for river basin development and management. All too often these activities reflect contradictory goals. There is a general lack

of coordination and integration of the objectives and programs both within and among the relevant agencies.⁶ Quite frequently these policies, programs, regulations, and plans are isolated from and have little relevance to the decisions and practices that are present in the agencies that actually allocate and deliver water supplies.

The recognition of the growing problems involved in providing an adequate water supply to meet future demands on the system and in removing the present barriers to effective adaptation to these pressures has resulted in an increased interest in planning. The broader use of planning at all levels within the water system has come to be considered an indispensable prerequisite to the successful design of activities which are capable of effectively meeting future water needs. It has been frequently determined that water requirements of the nation are of such a nature that they require more systematic organization of the water systems if those systems are to pursue carefully formulated goals.⁷ There have been increased efforts to define, articulate, and assign relative values to the goals that should be achieved within the water resource system. Systematic planning is often considered the most effective way to organize the activities of relevant institutions for goal achievement. Therefore, effective planning is deemed necessary if water resource systems are to meet the demands being pressed upon it. Conversely, the present state of affairs is frequently explained as the result of inadequate planning in the past operation of water systems.

The Nature of Planning

Planning involves the development of proposals which are designed to guide future activities of the organization, unit, or system in the

pursuit of organizational objectives.⁸ It involves an attempt to rationally order the individual decisions and activities of the system toward goals specified by the decision-making structures of the organization. The primary purpose of planning is to devise ways and means of effectively achieving organizational goals through time. Conversely, the planning input to decisional processes seeks to inform decision-making to minimize consequences destructive to the realization of the purposes of the organization.⁹ Therefore, planning is basically a process involving the identification of organizational objectives and goals and the establishment of guidelines for the future behavior of an organization and its component parts that facilitates the achievement of these objectives and goals.

All individuals and organizations implicitly or explicitly engage in planning activities. These activities may be simple or complex, long or short range, focussed or diffused, the work of specialized planners or a collective function of administrators or managers, but the essential point is that these activities are present in all human decision-making behavior. The present emphasis upon planning in the water system is more than a recognition of this elemental fact, it is a call for explicit, self-conscious, purposeful, comprehensive, long range and effective planning. Planning is, therefore, both a description of one significant aspect of the empirical activity of organizations and a normative structure that prescribes in a general way how this activity ought to be conducted.

Whether looked at from a normative or an empirical perspective, the planning process can be usefully conceptualized as including a number of separate but interdependent components. The major steps in the planning process are: (1) The identification of the goals that the organization

should achieve. This activity includes the determination of the degree of achievement that should be present at selected points in the future; (2) The search for and the specification of alternative choices that are available to the organization in the relevant time periods. The determination of significant environmental constraints and the evaluation of the resources available to the organization are important dimensions of this problem; (3) The evaluation of the alternatives in the light of the objectives, goals, and resources of the organization; (4) The development of a projected course of action designed to guide individual future decisions into a pattern of choice that is rationally related to the goals of the organization; (5) The implementation of the plan through the taking of organizational decisions as specified by the plan; and (6) The periodic appraisal of the activities of the organization as they relate to the dictates of the plan. This activity includes the evaluation of effectiveness with which the plan is leading the organization toward desired objectives as well as the evaluation of the importance of any environmental changes which may be relevant to the effectiveness of the plan.¹⁰

Once the decision to plan purposely has been taken in an organization, there are a number of related decisions which must be made--either explicitly or implicitly--that affect the nature and scope of the planning activity. These include: (1) the determination of the time period or periods to be covered by the planning activity; (2) the range of organizational activities which will be covered by the plan developed; (3) the amount of resources that will be allocated to the planning activity; and (4) the relationship that the planning activity will have to the operational decision-making of the organization. The choices

that are made along these dimensions have a significant impact upon the nature of the plan devised and its affect upon the behavior of the organization.

There are a number of factors which limit the ability of any organization to plan effectively. Some of the more significant ones are: (1) the limited range of control over its environment that is available to the organization; (2) the limited resources that are available to the organization both for development of plans and for the effectuation of the plans; (3) the scope of control or influence of the organization; (4) the inability to predict relevant internal and external variables which affect the content of any plan and its "fit" with the ongoing problems of the organization; and (5) changing organizational goals which result from internal conflict or changing environmental factors. The presence of a large number of constraints within which the organization must operate substantially restrict the effectiveness of the planning process. Therefore, even the most intense commitment to planning does not guarantee that the planning effort will effectively lead to the achievement of organizational goals.¹¹

The act of planning is a future oriented input into decisional processes. The comprehensiveness and effectiveness of planning activities vary substantially among organizations. The nature of the organization and its setting as well as the quality of the planning activity determine the range of planning activities carried forward and the effectiveness of the plans developed for the achievement of organizational goals. Planning is an activity which is conducted in all organizations and the nature of the activity has a direct impact upon the success of the organization.

Local Water Agencies

Relatively little attention has been given to the planning processes of local water agencies which deliver water resources directly to the consumer. These agencies are a vital link within the water resource system and play a critical role in the total planning process.¹² The planning activities of these organizations and the decisions arrived at in them have a very direct affect upon the quantity and quality of water that will be available to meet future needs. Similarly, the effectiveness of more comprehensive plans for water resource development, preservation, and utilization is dependent to some extent on the activities of local water agencies. In the final analysis, comprehensive plans must be effectuated through the activities of these organizations. Therefore, the analysis of water planning from the perspective of the local water agency is a significant component of the understanding of the total planning activities present in the water resource system and an important source of information relevant to the calculation of the probable effectiveness of more comprehensive planning efforts upon the actual operation of the water supply system in the United States.

The local water agencies number in the thousands in the United States.¹³ They are the primary mechanisms for the delivery of water to irrigation, domestic, and industrial users. They also control substantial amounts of water resources which may be used for recreational purposes. They have vested legal rights to a very substantial portion of the developed water supplies in the United States. Because of the strategic position that they hold in the total water resource system, they must be taken into account in the development of effective water policies, programs and plans.

The nature of the local water agencies vary substantially along a number of dimensions. They may be public governmental agencies or they may be privately owned concerns. They may furnish irrigation water to very few acres of agricultural land or their service may cover many thousands of acres; they may serve a very few domestic users or they may provide service for large metropolitan areas. Many of these agencies are very simple in structure and have relatively low levels of resources while others are highly complex and control very significant water and financial resources. Planning operations, as a specialized activity, vary substantially with the complexity, size, and resources of the organization that is involved. Nevertheless, the activities of all of these organizations in the aggregate are a most critical aspect of the water resource system. This study has the planning activities of a representative sample of such organizations as its primary focus of attention.

Objectives of this Study

The primary objective of this research is the determination of how planning actually gets done in local water distribution systems. The achievement of this objective requires that the research establish empirically the existence and operation of planning functions in local water agencies by identifying the persons responsible for these functions and the nature of the functions that are performed. This analysis includes the determination of social and organizational characteristics of the persons charged with the responsibility for planning in these agencies as well as the basic values and attitudes held by the planner. The study involves the systematic examination of the planning inputs into the decisional processes of representative local water agencies. These inputs involve the flow of information and values that determine the objectives

pursued in the planning process and that influence the evaluation of operational alternatives identified in the course of planning activities. The analysis is carried forward within a comparative framework in order to determine the relative effectiveness of the planning activities in local water agencies of different types. The primary bases of classification that are used are those of size of the organization and type of organization, i.e., whether the agency delivers water for irrigation or domestic uses.

A secondary objective of the study is to look at the local water agency as it relates and interacts with the larger planning systems. This analysis includes the identification of the patterns of communications and linkages between water agencies of similar types in the area and with other types of water agencies. Such information is used to measure the degree to which the planning activities of these agencies are consistent, coordinated, and integrated. This involves an evaluation of the degree of coordination of efforts and activities of the primary actors in the local water planning system. Similarly, the study identifies the degree of interchange between those responsible for planning in local agencies with those that have responsibilities for planning at other more comprehensive levels within the water resource system. This analysis attempts to identify the extent to which the attitudes, skills, and advice of central planners are taken into account by the local planners and the extent to which the local planners communicate their desires and needs to the central planners. Therefore, a major objective of this analysis is to identify features of communications patterns and authority relationships which either facilitate or impede successful planning for the agency and comprehensive planning for water resource administration.

The persons charged with the responsibility for planning in local water agencies are the focal point of this study. The study attempts to identify the primary influences that flow toward the planner and shape the nature of his planning activities. These influences flow from the background of the individual planners and from within and without the organization. The relative importance of these influences is examined. Similarly, the analysis attempts to determine the impact of planning activities upon the decisional processes of the organizations and of the total water resource system of which local agencies are only small components. Finally, the analysis attempts to identify the ways in which the individual planners are linked into a total planning system for water resources. This includes their linkages with other agencies and persons responsible for more general planning activities. The planner is, therefore, conceptualized as both a recipient of significant inputs from the larger system and as a significant source of inputs into the activities of the larger system.

Scope of the Study

The research site for this study is a seven county region in the watershed of the South Platte River in Colorado. These counties are those of high population density within the river basin. The area is marked by a highly productive irrigated agricultural economy and by a rapidly growing population and significant industrial expansion. It is an area of general water scarcity with most available water supplies fully appropriated and utilized. The result is that any attempts to increase the amount of available supply involves substantial investments. The conflicts that are present tend to represent in an extreme form the potential for conflict between agricultural and non-agricultural users

which can be increasingly expected when water resources are in short supply. The area is served by more than 250 separate water agencies which vary substantially in size. There are roughly equal numbers of irrigation and domestic agencies which were identified for inclusion in the universe of agencies for this study. The basic pattern of these agencies in terms of type, size, and relative service areas are summarized in Tables 1 and 2, page 12.

The bulk of the agencies in both sectors are relatively small. The majority of the irrigation companies provide water to less than 5,000 acres. The ten largest companies in the area serve nearly half of the total irrigated acres that are included in the area covered in this study. These companies are generally private mutual companies primarily delivering water to their stockholder-users.

The vast majority of the domestic agencies are very small. They typically serve less than 1,000 taps or some 3,000 persons. One agency, the Denver Water Board, provides service to nearly half of the total domestic users in the area. The domestic sector is marked by greater diversity in structural form than is the irrigation sector. The domestic agencies include municipal water agencies, special districts, and private mutual companies. One agency provides domestic water to nearly half of the taps in the entire area.

The samples. This study is based upon the results of interviews conducted with two samples of actors within the local water planning system. The first sample is representative of those persons charged with the responsibility for planning activities in local water agencies in the study area. The persons to be interviewed were selected using a randomized stratified sampling design. As indicated in Tables 1 and 2,

Table 1

SERVICE AREA OF IRRIGATION ORGANIZATIONS:
BY SIZE OF ORGANIZATION

Size of Organization	Organizations		Area Served	
	<u>Number</u>	<u>Per Cent</u>	<u>Acres</u>	<u>Per Cent</u>
Under 1,000	25	20.00	12,190	1.40
1,000 - 2,999	39	30.00	68,900	7.90
3,000 - 4,999	18	14.00	67,400	7.70
5,000 - 9,999	21	16.00	148,900	17.00
10,000 - 20,000	14	12.00	155,190	18.00
Over 20,000	<u>10</u>	<u>8.00</u>	<u>424,420</u>	<u>48.00</u>
Totals	127	100.00	877,000	100.00

Table 2

SERVICE AREAS OF DOMESTIC WATER ORGANIZATIONS:
BY SIZE OF ORGANIZATION

Size of Organization	Organizations		Area Served	
	<u>Number</u>	<u>Per Cent</u>	<u>Taps</u>	<u>Per Cent</u>
Under 249	77	57.00	7,730	2.00
250 - 999	27	20.00	13,900	4.00
1,000 - 2,499	11	8.00	26,600	7.50
2,500 - 7,499	11	8.00	45,000	8.50
7,500 - 15,000	9	6.00	109,000	31.00
Over 15,000	<u>1</u>	<u>0.70</u>	<u>166,000</u>	<u>47.00</u>
Totals	136	99.70	368,230	100.00

Source: Julian Pineda, Planning in Local Water Organizations (Unpublished Masters Thesis, Colorado State University, 1970).

page 12, the water agencies identified in the area were distributed into twelve categories according to their type and size. A ten percent sample was drawn from each of the categories by assigning each agency a number and selecting the agencies to be included through the use of a table of random numbers. Each category was represented by at least one agency being included in the sample. A total of thirty-one agencies were selected of which fifteen were irrigation agencies and sixteen were domestic agencies.

After the agencies were selected for inclusion in the sample, the chief administrative officer of the agency was identified and contacted by a member of the research team. He was asked to designate the person within his organization who held primary responsibility for the planning activities of the organization. The person designated was considered to be the agency "planner" and was the person with whom an extensive interview was conducted. The data collected from these interviews provide the base from which the analysis in this study proceeds.

As one aspect of the interviews with the planners, they were asked to identify those persons most important to them in carrying out their planning activities. These persons were identified as sources of advice, information, and authority for the planners. Persons identified through this process comprise the basic component of the second sample. Members of this second sample were interviewed. During the interview they were asked to specify those persons with whom they communicated about water planning matters. Persons receiving the greatest number of nominations by members of the second sample were also interviewed. Thereby, the total sample includes those persons considered to be important in the planning process by the planner and also by the nominees of the planner. The 118 nominees were defined as "planning influentials."

The data upon which this study is based is, therefore, drawn from extensive interviews with two samples of actors in the water planning system. These include a representative sample of the persons charged with planning functions in local water agencies and those persons who are most often designated as important sources and objects of communications within the planning system. These persons and the linkages between them provide an empirical structure of communications and authority relationships which are representative of the activities and interrelations which in combination define the local water planning system.

The interviews. Each of the persons identified as an important part of the local water planning system was interviewed by members of the research team. A systematic interview schedule was designed which included a large number of structured questions constructed to identify significant dimensions of the planning process and the communications patterns that are present in this process. Similar questions were directed to the agency planners and the "planning influentials."

The interviews with the planners focussed their attention upon: (1) the personal characteristics of the planner including his social background, training, values, orientations, and perceptions; (2) the nature of his planning activities including goals, objectives, problems, practices, and barriers encountered in the planning process; (3) the patterns of communications of the planner with persons within and outside of the organization; and (4) the authority relationships which are present in the water planning process in local water agencies.

The interviews with the "influentials" attempted to identify: (1) the social orientations, values, perceptions, and background characteristics of the influentials; (2) the basic role played by the person in

the water planning system; (3) the communications patterns of the influential both with the local water agency and other components of the water resource system; and (4) the perception of the goals, problems, and barriers that the influential considered to be important in the water planning system.

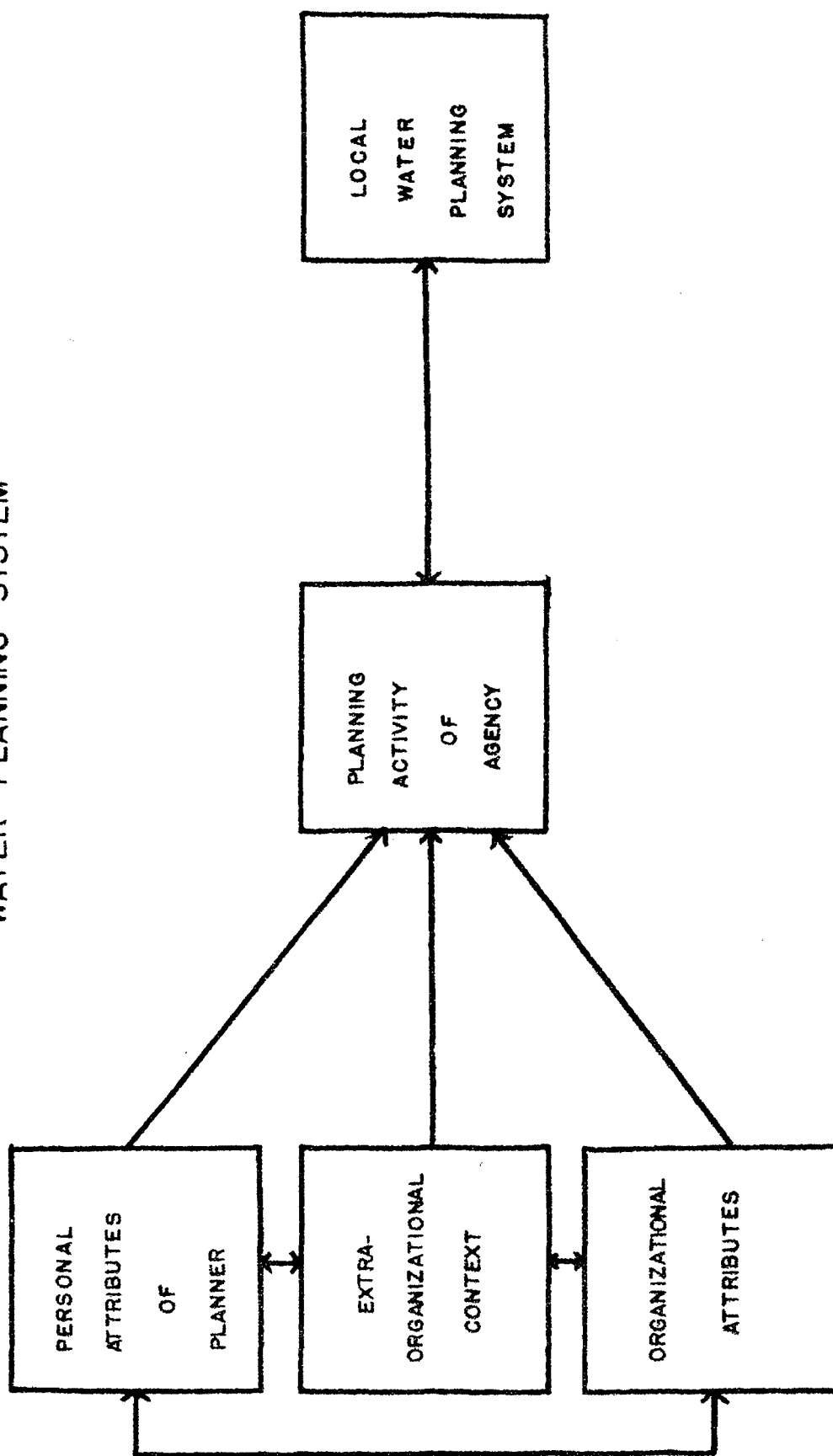
The analysis and systematic ordering of the data obtained from the interviews provides a means of systematically describing the planning process as it operates in local water agencies. This analysis identifies the primary inputs into the planning activities of local water agencies and specifies the ways in which these activities can be related to the planning and decisional activities that occur throughout the local water resource system.

Design for Analysis

The planning activities of the local water agency are conceptualized as the future oriented (planning) inputs into the decisional processes of the organization. The study centers upon the activities of those persons who have the primary responsibility for planning within the agency and those persons who are denoted as "planners" in this study. The primary analysis is related to the identification and description of the more salient influences upon the planning activities of local water agencies and to the evaluation of the significance of them for the total pattern of regional water resource planning.

The analytic scheme--which is graphically depicted in Figure 1, page 16--identifies and focuses attention upon four interrelated sources of influence which shape the planning activities of the local water agency. These sources of influence are: (1) the personal attributes of the

FIGURE 1

FLOW OF EFFECTS IN A LOCAL
WATER PLANNING SYSTEM

planner; (2) the organizational attributes of the local water agency; (3) the extra-organizational context of the planning activities; and (4) the primary configurations that are present in the local water planning system. The analysis describes the impact of these factors upon agency planning activities and traces the patterns of interaction between agency planning and the nature of the local planning system.

Personal attributes. The values, orientations, perceptions, and skills of the planner are significant sources of influence upon the choices that are made in the conduct of planning activities. These factors influence the nature of the alternatives that are identified and the pattern of choices followed by the individual planner. These components of the personal attributes of the planner result from his socialization, training, and experience. The major dimensions that are relevant to planning choices are:

1. Background characteristics of the planner. These characteristics include factors such as occupational background, length of residence in the area, and social and professional organizational membership.
2. Training of the planner. This dimension includes both the formal and informal training and educational experience of the planner.
3. Values and attitudes of the planner. This dimension includes the planner's view of the importance of planning, the attitude toward change that he evidences, and the degree of personal effectiveness he has developed.
4. Perceptions and orientations of the planner. This dimension includes factors such as the degree to which the planner evidences faith in experts in the planning process, his view of environmental problems and constraints, and his conceptualization of the water resource system in the area.

These factors are investigated in order to describe the characteristics of those persons charged with the responsibility of planning in

local water agencies and to identify those factors which influence the nature of local agency planning activities. The results of this investigation are reported in Chapter II of this report.

Organizational attributes. The organizational context within which the planning activities are conducted has a substantial impact upon their nature and consequences to them. The primary characteristics, objectives, and relationships within the organization shape the range of alternatives that are available to the planner and to some extent dictate the choices that must be made in the planning process. The most significant organizational attributes are:

1. The nature of the organization. This set of characteristics include the type, size, and organizational configuration of the agency. Whether the organization serves domestic or irrigation users and whether the organization is a public or private agency are significant aspects of this dimension.
2. The place of the planner in the organization. This dimension involves the formal position of the individual with planning responsibilities and both the formal and informal relationships between the planner and other organizational structures such as the board of directors, executive officers, and clientele groups.
3. Organizational resources. The resources that are available to the organization--human, financial, and physical--are of critical importance both in the making of plans and effectively placing those plans into operation.
4. Objectives and goals of the organization. The objectives of the organization are one of the most important factors in the development of the planning activities.

This set of organizational attributes not only shapes the nature of the planning activities that go forward within the organization, but it also influences the impact of the planning activities upon the decisional processes of the organization and the effectiveness of the plans in meeting organizational needs. The nature of the data available in this

study dictate that these organizational attributes be identified through the reported perceptions of the planners. The organizational attributes and the planning process are the subject of discussion in Chapter III of this report.

Extra-organizational context. The planning activities of the local water agency are constrained by a number of factors that are external to the organization. These external factors limit the range of alternatives that are available to the organization and significantly influence the effectiveness of organizational plans. The more salient dimensions of the external environment of the organization are:

1. The available water resources in the area including the demand for these resources and the distribution of ownership of them.
2. The legal constraints that are present including the legal position of the local water agency and the body of water law within which planning must operate.
3. The distribution of power within the local water system which includes the relationships between local water agencies and between those agencies and other structures at the local, state and national levels.
4. The attitudes, values, and orientations of relevant publics external to the water agency.

These factors represent constraints upon the activities of the planner in a local water agency. As parameters they limit the range of options that are available to planners at any given point in time. Although the activities of the planner may reshape these parameters to some extent, the shortness of the data collection period does not allow for the consideration of such variations. Within the context of this study, the extra-organizational factors are examined through the eyes of the planner and the "planning influentials" who were interviewed. However, it has frequently been argued, particularly in a decision-making context, that

it is the perceived constraints that have the greatest impact upon decision-making rather than those that might be identified by some external "objective" observer.¹⁴ These extra-organizational factors will be discussed in Chapter IV.

The local water planning system. The local water planning system is conceptualized as both a result of and an influence on the planning activities of the individual water agency. The planning activities of the organization contribute to the total planning activities in the area and the planning activities of other agencies and structures in the system serve as a part of the context within which organizational planning goes forward. The interactions and communications flows which make up the local planning system and the relationships between these and the planning activities in the local water agencies are subjected to analysis in Chapter V of this report.

The basic design of this study directs attention to the planning activities within the local water agency and the contribution of these activities to the total planning effort in the water resource field in the region. The planning activities are analyzed to determine the impact of personal, organizational, and environmental factors upon the planning activities of the local water agency. Chapter VI of this study represents an attempt to specify the relative significance of each of the factors in the planning activities of the local water agency and to trace the general configurations of the local water planning system. This chapter draws upon the analysis of the other components of the study to suggest the nature of the primary constraints and problems that militate against effective planning efforts and possible ways in which these could be minimized.

Summary

The demands upon the system for the allocation and distribution of water resources are rapidly increasing in the United States. The system through which these activities are carried out is highly diffuse and fragmented which makes systematic coordination and effective utilization of water resources difficult. There is a growing demand for more effective planning in the water resource area. This study attempts to determine how planning actually operates within a sample of local water agencies and how these planning activities are related to a larger local water planning system. The data upon which the study rests are drawn from interviews with thirty-one local agency "planners" and one hundred and eighteen "planning influentials." These interviews were designed to identify the personal, organizational, and environmental influences upon the planning activities of the local water agencies and to determine the relative impact of each upon the planning process. Each of these factors is analyzed in turn and the interactions among these factors are examined. An attempt is made to identify and evaluate the major blockages that are present in the system to effective planning activities and to suggest means of minimizing the impact of these blockages.

Chapter II

THE LOCAL AGENCY PLANNER

The primary purpose of this chapter is the identification and description of a number of the more significant personal characteristics of the persons who are responsible for the planning activities of local water agencies. The persons who are responsible for the planning activities in thirty-one representative water agencies were interviewed. The data upon which this analysis is based are drawn from the results of these interviews. The basic task here is to develop a profile of the local agency planner based upon dimensions such as background characteristics, attitudes, values, perceptions, and orientations. These dimensions represent significant personal attributes which the planner brings to his planning duties. These attributes operate as one set of constraints that are present in the planning process. These factors condition, at least to some extent, the kinds of planning activities carried out by the planner and the pattern of decisions reached in the planning process.

Background Characteristics

The analysis of the background characteristics of the respondents reveal that they comprise a relatively homogeneous population. The similarities in the backgrounds that were reported far outweigh the differences. Roughly two-thirds (20) of the planners interviewed were persons who are more than 55 years of age. One-fourth of the entire sample is composed of persons over 65 years of age. Conversely, only ten percent of the respondents are under 35 years of age. Therefore, the bulk

of the planners are near the end rather than the beginning of their professional careers.

The sample is dominated by persons who are long time residents of the region. Eighty percent of the respondents reported that they had lived in the area for more than 15 years and more than half of them (17) reported that they had lived in the area all their lives. Only four persons in the entire sample reported that they had lived in the area for less than seven years. These data indicate that a highly stable residence pattern is present in the backgrounds of the agency planners. Over eighty percent of the respondents indicate that they spent most of their lives before the age of 21 in either small towns or rural areas. These are, of course, the kinds of communities in which the bulk of the respondents currently reside. Thus, the persons charged with the responsibilities for planning in the local agencies are relatively old, long term residents of the area who were reared in small towns and rural areas.

The socio-economic characteristics of the planners also reveal a number of commonalities. The majority (17) reported that their fathers were farmers or farm managers. The remainder of the respondents are nearly equally divided between families in which the father was a blue-collar worker and those in which he performed professional or managerial roles. The level of educational attainment of the respondents is quite low with nearly two-thirds (20) reporting having completed 12 years or less of formal education. Six of these persons report that they did not complete high school. While eleven of the respondents reported some education beyond high school only three of these reported that they had completed college. The respondents generally reported no formal education

or training relevant to water administration and planning in addition to the general education reported above.

The income levels reported by the planners are somewhat more diverse than are the other characteristics. This may be at least in part a function of the unreliability of reported incomes which is particularly pronounced in farming occupations. One-fourth of the respondents report incomes of less than \$7,500 per year. Some thirty percent of the planners report incomes of between \$7,500 and \$15,000, approximately fifteen percent report incomes of between \$15,000 and \$25,000, and thirty percent report incomes of more than \$25,000. Although the average education of the respondents is relatively low, the typical income reported is relatively high. One additional characteristic of the income distributions should be specified. A substantial number of those persons who reported low incomes also indicated that they consider themselves to be retired.

The data indicate that there are significant differences in the occupational backgrounds of the irrigation agency planners and the domestic agency planners. The irrigation planners are very homogeneous with only two of them indicating any previous employment other than farming. Greater diversity of background is found in the domestic sector. About half of the domestic planners indicate they have worked as blue collar workers or in clerical positions before entering their present employment and the remainder indicate that they have a background in professional or managerial positions.

The data that identify the socio-economic characteristics of local planners indicate that the typical planner is a person with relatively low education, relatively high income, and relatively stable occupational background. There is a striking similarity between the reported

occupational background of the respondents and the occupation that they report was pursued by their fathers. These data indicate that there is a great deal of stability and commonality in the socio-economic backgrounds of the respondents.

The organizational and associational memberships of an individual serve as a significant source of relationships and information which may shape orientations, attitudes, and perceptions. The respondents in this study evidence a relatively strong propensity to be members of social, civic, and professional organizations. Although none of the persons interviewed reported membership in school associations and less than half indicated membership in religious organizations, the majority of the respondents do report that they are members of civic, social, and fraternal organizations. A majority of the planners consider themselves to be members of a political party. Eleven report that they are members of the Republican Party and six identify themselves as Democrats. However, thirteen indicate that they are not members of either of the major political parties.

One of the most critical areas of associational activity is membership in professional associations which may serve as a direct influence upon the professional activities such as those under consideration in this study.¹ Almost all of the planners for domestic water agencies report that they hold membership in one or more professional associations but none of the planners in irrigation agencies report membership in such organizations. The professional association most frequently identified by the domestic planner is the American Water Works Association. However, most of the irrigation planners reported that they are members of one or more farm organizations such as the American Farm Bureau, the

Farmers Union, or the Grange. Very significantly none of the irrigation planners and only two of the domestic planners indicate membership in any professional association organized specifically for planners. The exceptions are planners in two of the larger domestic water agencies. These patterns of organizational membership suggest that the orientations of the planners in the irrigation and domestic systems may be quite different. These data seem to indicate that the domestic planners see themselves at least to some degree to be professional water specialists and that the planners in the irrigation system consider themselves to be farmers first and their water related roles are instrumental to this basic activity. This interpretation is reinforced by the fact that the majority of the domestic planners (10) report that they work full time for the water agency and only three of the irrigation planners indicate full-time employment.

Occupational Orientations

In considering the skill level of an individual, the formal education and training that has been received is supplemented by the experience that he has had during the course of his work life. Such experience is an important source of skills and orientations which may significantly influence the planning and decisional activity of the individual. All except one of the persons interviewed in this study indicate that one of the significant activities in which they engaged in the course of their present employment was to devise ways and means of meeting future needs of the organization. They reported that they considered these activities to be planning behavior. Thus, the persons who are designated as planners agreed with the basic conception of planning posited in this

study and reported that at least some part of their time was devoted to planning activity. However, only two persons in the entire sample indicated that they thought of themselves primarily as planners. When the planners were asked to specify the role they played, a wide range of self-identifications was reported. These varied from concerned citizens to water managers. Very few of the respondents indicated that they thought of themselves as specialists in water matters and only two considered themselves to be professional planners.

The actual positions held by the individuals responsible for the planning activities in the local agencies also varied greatly. The largest number of persons in the irrigation agencies reported that they were the president and/or secretary of the organization although one planner indicated her primary role was a ditchrider. The domestic planners tended to be either the manager or superintendent of the agency. One of the respondents in the domestic sector was mayor and another reported that he was director of planning. Therefore, the typical pattern of occupational role exhibited was that the chief executive official in the agency is primarily responsible for the planning activities of the organization. Occasionally such responsibilities are allocated to persons at the lowest operational level in the agency or to persons with broader political responsibilities.

An important aspect of occupational orientations is the degree to which the individual sees his present employment as a permanent position and the opportunities it presents for movement to a more responsible position. The persons included in this study do not see themselves as a part of a highly mobile profession. The vast majority of the respondents indicated that they expected to hold the same job five years from

now as they hold at the present time. The largest number of the remaining reported that they expected to be retired and inactive within five years. Only two respondents--both from the domestic agencies--reported that they saw their present position as a means toward advancement in the management, water resource, or planning areas. Similarly, there was little reported dissatisfaction with this state of affairs. The majority of the respondents indicated that their present position was one they would like to have in five years. Thus, generally the persons interviewed have been involved in similar activities for a substantial period of time, expect to maintain present or similar employment into the future, and are generally satisfied with this expectation.

The data above indicate a very low level of reported identification by local agency planners with professional planning. These findings are reinforced by the analysis of the primary sources of professional communications reported by the planners. While nine persons indicated that they believed that professional seminars are important sources of planning information, only four of these reported that they had attended such a seminar in the last three years. Similarly, seventeen respondents indicated that they thought that professional journals are important sources of information to be used in the planning process and fifteen reported that they regularly read journals which deal primarily with water related issues. Again, the domestic planners evidence a stronger professional orientation than do the irrigation planners. Roughly twice as many domestic planners report that they read such publications as did the irrigation planners. The most frequently read materials are those published by the American Water Works Association. Other important sources of information that were identified by persons in the domestic sector were Sewer and

Water Digest, American City, and governmental reports. The irrigation planners report a much lower level of readership of water related journals with Irrigation Age being the most frequently reported source of information. Other sources mentioned were the Colorado Water Congress Newsletter, Soil Conservation Newsletter, and governmental reports.

Again, the domestic agency planners show a more professional orientation and their interests tend to revolve around water problems directly while the irrigation planners show a lower level of professionalism and their interest tends to be limited to general issues in the agricultural sector.

Water Resource Policy Orientations

The way that the planners look at water problems in the area and the general orientations they have toward water policies may condition the way they respond to their planning activities. There is relatively broad agreement among the respondents on the nature of water problems in the area and on a number of possible responses to these problems. Virtually all of the planners agree that the reuse of water used be increased and that the concept of beneficial use should be expanded. The planners generally doubt that there will always be plenty of water available to meet the needs of the area, but a majority do indicate that they believe that threats of water loss have been exaggerated. Over eighty percent of the respondents believe that the industrial and urban growth in Colorado should be regulated to preserve present water supplies and that water distribution should be more closely regulated. A majority reject the contention that recreational values should be given more consideration in water agency planning activities. The planners are nearly evenly divided on the questions of whether the prior appropriation doctrine has

outlived its usefulness and whether the surface and ground water systems should be fully integrated into a single regulatory system. These data indicate that there is generally a common pattern of perceptions present in the system and that there is strong support for the value of water preservation or conservation and that support is present for governmental policies aimed at obtaining this goal. However, there is a clear indication that support for these activities is constrained by a desire to maintain agency autonomy and by greater fear of changes that would dramatically alter established relationships.

Planning Orientations

The attitudes held by individuals toward planning, planning activities and the planning process condition responses to planning duties. Respondents indicated a positive orientation toward the idea of planning in both their personal and agency affairs. Roughly two-thirds of the planners indicate a preference to plan ahead rather than make up their minds when decisions are called for, and they believe that they can plan effectively for the future. All except one of the planners indicate that water planning activities should take into account the needs of the area for at least fifty years. More than eighty percent of the respondents believe that many of the current water problems in the area are the result of inadequate planning in the past. It is, therefore, clear that the bulk of the respondents have a very favorable attitude toward planning at the most abstract level.

Resistance to change may be an important barrier to effective planning efforts. A majority of the planners indicate that they have a very positive attitude toward change and do not evidence attitudes that

would block change although there is substantial support for the idea that new ideas breed trouble. The personal attitudes of the planners are such that they tend to support rather than resist efforts toward change in the system. There is at least symbolic support for the idea of long range, comprehensive, and effective planning.

The respondents evidence a significant commitment to local control of water resources and to local agency autonomy. The vast majority of the planners believe that the local agencies should determine for themselves what the "best use" of water should be. Over ninety percent of the respondents believe that state officials understand water problems better than do national or federal officials. Similarly, those persons who oppose the creation of a river authority for Northern Colorado indicate that a fear of loss of local control and agency autonomy are major reasons for opposing this innovation. Therefore, there appears to be a set of attitudes present in the system that would reject attempts at more effective planning if these involved substantial loss of local control or if they threatened agency autonomy in any major way.

There is broad agreement among the planners that rural and city water problems are so interrelated that they must be considered and solved together if they are to be solved at all. Similarly, there is general agreement that the conflict between these two sectors of the water system are growing every day. The feeling of conflict is much more pronounced in the irrigation sector where threats of loss of water to urban areas are frequently mentioned as one of the most important problems of the agency. These attitudes seem to indicate a general acceptance that there is a need for greater integration of the water system and a perceived need for more coordination of efforts in the system. However,

the general pattern of rejection and fear of central control tends to reduce the support for many of the alternatives designed to bring about greater integration and coordination. Thus, the research findings indicate that water systems insulate themselves as do most social systems from intervention.²

About two-thirds of the respondents believe that the way that water is allocated in the area is fair and equitable and an even larger proportion of the planners believe that the water allocation process can be correctly characterized as democratic. There is general support for the present configuration of the decisional system for water allocation. This may operate as a major constraint upon attempts to change substantially the relationships that are present in the system.

The localism and desire for agency autonomy described above is reinforced by the attitudes evidenced by the planners toward experts in the water resource system. Approximately two-thirds of the respondents believe that there are too many experts that are trying to solve water problems and that these experts do not "really" understand the problems. An even greater proportion of the planners believe that lawyers have too much influence in water matters. Conversely, nearly two-thirds of the respondents disagree with the contention that the use of consultants to solve water problems is a waste of money. Thus, there seems to be a general distrust of the expert in the system but this does not carry over to experts hired by an agency to deal with a problem the agency selects. This orientation seems to be related to the general commitment to local agency autonomy and control and to the fear of innovations and controls that develop outside the local systems.

Perceptions and the Planning Process

The final set of perceptions that are to be considered revolve around the planning activities that are described by the planners. Actually, the planning activities carried out by the respondents are quite limited with half of the planners reporting that they devote ten percent or less of their time to such activities. There are only two domestic agencies in which the planner devotes more than half of his time to planning and there are no irrigation agencies in which this much of the planner's time is so dedicated. Therefore, the characteristic planner is not a planning specialist but a person who has a broad range of agency responsibilities and who devotes no more than a small amount of time to planning activities.

The time span covered by planning activities tends to be quite short in the typical agency. Twelve planners reported that periods of less than two years were taken into account in planning activities, twelve others reported they took periods between two and ten years into account, and only three reported that any time span in excess of ten years was taken into account in the planning activities of their agency. There were no irrigation planners who claimed to take any period beyond ten years into account in planning. This finding is at least partially related to the fact that virtually all of the domestic agencies expect their agencies to grow and almost all of the irrigation agencies see no agency growth. The irrigation planners generally expect or hope for maintenance of the present size of the agency. Similarly, most of the planners' attention is given to periods of less than three years in virtually all of the agencies despite their belief that 50-year planning is necessary. Hence, planning activities conducted by these agencies

tend to be non-specialized, short termed, and operational in nature.

The operational nature of most local water agency planning is underlined by the kinds of goals, problems, and barriers which the planners reported to be important in their planning activities. The irrigation planners most frequently specified that sources of water and water rights, construction and maintenance problems, and finances were the things taken into account in the planning process. The pattern was very similar in the domestic agencies with finances and construction and maintenance problems being most frequently identified. The two goals that the irrigation planners most frequently pursue in their planning activities are physical improvements and the conservation of water. The domestic planners specify that the improvement of water supply and service and physical improvements are the primary goals pursued in their planning activities. Finances are identified as the most serious barrier to more effective planning by both the irrigation and domestic planners. The lack of adequate financial resources is more frequently seen as a significant constraint by the domestic than the irrigation planners.

The planners were asked to rank a number of future problems as they related to the planning process. They ranked these in terms of what they considered to be the most significant problems, what they believed their users believed were the most significant problems, and what they considered the general public thought were the most significant problems. The planners ranked the maintenance of an adequate water supply as the most significant problem and this was closely followed by the need to preserve water rights, the development of more effective delivery systems, and water quality. Thus, planners are a part of the water supply-sewer syndrome. They do not see the problem in a broad social benefit context.

The planners reported that they believed that their users would specify the same four problems as most significant but that the users ranking would be somewhat different. They reported that the users would believe that the protection of water rights was more important than the maintenance of an adequate water supply and that they would rank water quality above the problem of developing more effective delivery systems. They also indicate that they thought that the users were more interested in maintenance of the present rate structure than planners. The rankings that they would expect to be present in the general public were quite different from their own. They reported that water quality was the most significant problem in the perception of the general public and this was closely followed by recreation needs which was a problem of very low priority for both the planner and users. The other two problems that they believed would be of more interest to the general public were the maintenance of an adequate water supply and the development of a more effective delivery system.

These data indicate that the planners spend most of their limited time allotted to planning in dealing with operational problems of construction, maintenance, and finance. They are concerned over the adequacy of water supply and the problems associated with physical facilities. The lack of financial resources is seen as the most significant constraint on both planning and the achievement of organizational goals. They see very little conflict between their perception of the problems and those of their users. Yet they do see that public perceptions differ substantially from their own. However, recent controversies centering around questions of quality and utilization of water would indicate that the differences might be a significant source of conflict.

Summary and Conclusions

The data that identify the personal attributes of the local water agency planners reveal a wide range of shared characteristics among the planners. The basic homogeneity of the population and the relatively small size of the sample preclude the use of significant statistical measures to test the impact of personal characteristics upon the planning behavior of the individuals. The most significant differences in personal characteristics are apparently linked to the variations between the irrigation and domestic agencies and will be analyzed in greater depth in Chapter III.

The background characteristics of the planners reveal a pattern in which the typical planner is one who is relatively old, male, the recipient of a limited formal education, and who has a relatively high income. The typical planner has lived most of his life in the area and was reared in a small town or a rural area. The occupational achievement reported is quite similar to that of the fathers of the planners. The largest number of the planners come from families engaged in agricultural pursuits and most of the irrigation planners still consider themselves to be farmers. The entire sample is marked by a very limited social, occupational, and geographic mobility. These background characteristics furnish the planner with relatively meager personal resources to engage in long range, comprehensive, and effective planning activities.

The planners tend to be relatively active in associations whose activities are most directly related to the planner's organizational and occupational roles. The domestic planners tend to be active in professional water associations and the irrigation planners tend to be active in farm associations. The planners in both sectors tend to exhibit a

relatively low level of professionalism and particularly a low level of identification with professional planning. The planners tend to be executive officials of the agencies by which they are employed who spend a limited amount of their time in planning for the future needs of the organization. The time periods considered in the planning process tend to be quite short and the planning activities are primarily operational in nature. The major goals and problems taken into account are those associated with water supply and physical facilities. The major barrier to effective planning in both sectors is financial resources. The planners generally support the idea of long-range planning and look favorably upon the expectation of change. However, there is strong support for local control and agency autonomy which operates as a serious constraint upon the production of significant change in the system. Most planners are very favorably disposed toward public policies designed to conserve water supplies but are somewhat fearful of changes that would endanger established relationships within the system.

The profile of the irrigation planner presents a portrait of an individual who engages in planning activities for his organization. A very limited amount of time and resources are available to him and, therefore, he must focus his activities upon immediate and relatively short-range needs of the organization. This pattern is dysfunctional for effective long-range planning. The planner generally has a positive attitude toward planning but his limited resources and relatively limited formal training seriously impede the planning activities in which he engages.

Chapter III
ORGANIZATIONAL CHARACTERISTICS
AND THE PLANNING PROCESS

The role and function of the agency planner is shaped by the organizational matrix within which his planning activities are undertaken. The primary purpose of this chapter is to identify a number of components of the attitudes, orientations, and perceptions of the planners and relate these to significant organizational characteristics. These organizational characteristics are analyzed to determine the extent to which they are related to variations in the character of agency planning activities. The variables considered include both the general characteristics of the organization and a number of dimensions that define the position and role of the planner within the organization. The two most salient organizational characteristics that are considered, agency size and type, served as the primary variables used to stratify and to select the sample of agencies to be included in the study.

The analysis identifies and describes the differences and similarities between the attitudes of planners in irrigation and domestic agencies. A comparison of the character, range, scope, and importance of planning activities in these two types of agencies is carried out and the results are reported. The analysis is focused toward the identification of the significance of agency type in shaping planning activities and upon the evaluation of the contribution made by each type of agency to the total local water planning system.

Agency Characteristics

The agencies included in this study were selected in a manner to assure that they were generally representative of the water distribution agencies in the area. Those agencies included in the sample were roughly divided between irrigation and domestic agencies.

As indicated in Chapter I, the bulk of the agencies are relatively small which is typical of the local water distribution system in this area. The sampling design, however, assured that agencies of all sizes would be included in the study. The agencies represent the general pattern of organizational forms present in the system. Both public and private agencies are included. All of the irrigation agencies are mutual companies and, therefore, they are all in the private sector. The domestic agencies are characterized by a broader diversity of organizational patterns. Three of these agencies are private and the remainder are public. Both public water districts and municipal water systems are included in the sample.

All of the public agencies are in the domestic sector and this commonality presents a serious barrier to the investigation of the impact of this characteristic upon planning activities. The way in which the characteristics cluster together and the small size of the sample preclude the effective examination of the private-public distinction as an independent variable. Therefore, the analysis focuses on the irrigation-domestic distinction since this appears to be more salient to the shaping of planning activities in the agencies under study.

The formal position held by those persons charged with the responsibility for planning activities varies substantially among the agencies. As indicated in Chapter II, the typical irrigation planner is a farmer

who serves as president and/or secretary of the organization. The deviations from this pattern place an operating or maintenance employee in the position of planner. All but three of the irrigation planners report that they own stock in the company. The typical domestic planner also plays a managerial role within the organization. The titles of the planner vary substantially but most would have to be characterized as managers. Only two of the domestic planners report that they own stock in the agency. The deviations are very diffuse in that they vary from the mayor of the city to operating engineer. The most common pattern in both sectors is that planning is only one of several contributions made by the person charged with an agency's planning responsibilities.

There are a number of significant variations along dimensions that define: 1) the planners' stance toward planning activities within the two types of agencies, and 2) their evaluation of their role within their organizations and within the planning process as a whole. There is general agreement among the respondents in both sectors that planning is a necessary activity and that at least a part of their organizational activities are devoted to planning. More than 75% of all of the planners report that they believe that they have adequate information available to them to carry out their planning responsibilities effectively. However, the degree to which the individual planners are oriented toward the viability of planning and the promotion of change is quite different in the two sectors. An index was created from a number of responses which measures the intensity of commitment to the idea of planning and the orientation toward change as an aspect of planning that is present in the attitude patterns of the respondents. This "general planning index" provides a general measure of the orientation of the planner

toward the viability and appropriateness of purposeful innovation.¹ The data presented in Table 3 indicate that there is a clear difference in the orientations of the planners in the two sectors. There is a much greater intensity of acceptance of planning and change present in the attitudes of the domestic planners.

Table 3

INTENSITY OF SUPPORT FOR PLANNING
(in percentages)

Level of Support	Irrigation Planners	Domestic Planners
Low	33	0
Moderate	54	19
High	<u>13</u>	<u>81</u>
	100 (n = 15)	100 (n = 16)

The responses on the general planning index indicate that the domestic planners have strong commitment to planning and a positive image of purposeful change. This confident and optimistic orientation is reflected in the feelings of personal effectiveness evidenced by the domestic planners. An index of personal effectiveness was developed to measure the extent to which the planners believe they could influence water matters within their agency and the total local water system.² The relative positions of the irrigation and domestic planners on this index are presented in Table 4. These data indicate that there is a relatively higher feeling of personal effectiveness in the domestic sector than is present in the irrigation sector. The domestic planners are more convinced of their ability to shape the decisions and activities in the local water system than are the irrigation planners.

Table 4

INDEX OF PERSONAL EFFECTIVENESS
(in percentages)

Level of Support	Irrigation Planners	Domestic Planners
Low	40	6
Moderate	53	38
High	<u>7</u>	<u>56</u>
Totals	100 (n = 15)	100 (n = 16)

Thus, the planners in the domestic agencies evidence a stronger positive orientation toward the idea of planning, the appropriateness of change, and perceive themselves having greater power to influence the system. These measures indicate a greater confidence and more optimistic orientation on a part of the domestic planners than is found in the irrigation sector.

At least a part of these differences in the orientations of the planners in the two sectors is related to their perception of the future size and services of their organizations. Each of the planners were asked if they expected that growth would occur within their agencies. As indicated in Table 5, the expectations about the probability of future growth in their organizations are quite different in the two sectors. Almost all of the irrigation planners reported that they expect their organization to remain at its present size or to decline in the future. Conversely, most of the domestic planners expect to see a substantial growth in their organizations in the future. These differing expectations seemingly reflect a realistic appraisal of the changes that are occurring in this rapidly urbanizing area. Therefore, the attitudes toward planning evidenced by the planners in the two sectors in part

are quite compatible with the differences in the kind of planning activities that are demanded in expanding as compared to static organizations. Greater need for planning is present in a growing and changing organization than in a stable or declining organization. Most domestic agencies fit the former category and most of the irrigation agencies fit into the later category.

Table 5

EXPECTATIONS OF AGENCY GROWTH
(in percentages)

	Irrigation Planners	Domestic Planners
Yes	8	81
No	<u>92</u>	<u>19</u>
Total	100 (n = 14)	100 (n = 16)

Even though the irrigation planners are much less future oriented and less optimistic about the future than are the domestic planners, they do report that they are more satisfied with what their agencies are doing. Approximately 80% of the irrigation planners indicate satisfaction with the current operation and activities of their organization and only 60% of the domestic planners indicate such general satisfaction. This both indicates a greater commitment to change and an active orientation toward their responsibilities on the part of the domestic planners and a more fatalistic orientation on the part of the irrigation planners. The data clearly indicate that the evaluation of the activities of their agencies and the expectations for the future are substantially different for the planners in the two sectors. A greater feeling of confidence, optimism, and a more positive evaluation of the future are present in the domestic sector.

Agency Planning Activities

As indicated above, the orientations toward relevant planning variables are quite different in the two sectors of the local water distribution system. These differences in orientations are reflected dramatically in the kinds of planning activities that are reported to go forward in the two sectors of the system. The data presented in Chapter II indicate that the typical irrigation official with planning responsibilities is a part-time employee of the organization while the typical domestic planner is a full-time employee of the organization. Similarly, the planners in both types of agencies normally carry out a number of organizational roles other than planning. Therefore, a significant measure of the importance of planning activities to the agencies is the proportion of time the planner spends in planning activities. This dimension also measures the extent to which the planner specializes in these activities. The data presented in Table 6 indicate that all of the planners spend a relatively small proportion of their time in planning activities. There is again a clear difference between the irrigation and domestic planners. Almost all of the irrigation officials reported that they spent less than 10% of their time in planning activities while exactly half of the domestic planners who responded to this question indicated that they spent more than 10% of their time in planning. Although a few of the planners can be characterized as specialists who see planning as their primary agency function, this orientation is generally limited to the largest domestic agencies. It is apparent that one of the affects of the urbanization process is the elevation of the importance of planning.

Table 6

PROPORTION OF TIME DEVOTED TO PLANNING ACTIVITIES
(in percentages)

	Irrigation Planners	Domestic Planners
Less than 10%	77	50
10-50%	15	29
Over 50%	<u>8</u>	<u>21</u>
Totals	100 (n = 14)	100 (n = 13)

The individual planners indicate that they spend a relatively small proportion of their time involved in planning activities. A similar issue involves the proportion of the resources of the organization that are allocated to the activity of planning. The measure used to determine this agency commitment was the percentage of the total budget of the organization that is used for planning activities. A majority of the agencies in the two sectors indicate that they spend no money on planning activities per se. A small percentage of the agencies do spend more than 5% of their budgets on planning. The differences between the irrigation agencies and domestic agencies is not very great, but the domestic agencies do show a somewhat greater propensity to make direct budgetary allocations to the planning activities of the organization. The relative amounts of budgetary commitment to planning are described in Table 7. The data clearly indicate that a relatively low level of commitment of resources to planning activities is present in all of these agencies.

Table 7
BUDGET ALLOCATIONS FOR PLANNING ACTIVITIES
(in percentages)

	Irrigation Agencies	Domestic Agencies
None	57	57
Less than 5%	29	14
Over 5%	<u>14</u>	<u>29</u>
Total	100 (n = 14)	100 (n = 14)

An important aspect of the effectiveness and scope of planning activities is the time span that is taken into account by the planner when he devises plans. As planning is generally the future oriented inputs into organizational decision-making activities of the organization, it is quite significant to determine the agency's definition of the future that is used by the planner in the conduct of planning activities. There is a tendency in all of the agencies for planning to be primarily of a short-run nature. The periods of time taken into account in the planning process are short. This tendency is particularly marked in the irrigation agencies. The majority of the irrigation planners indicate that they take periods of less than two years into account in their planning activities. The activities of the domestic planners, as indicated in Table 8, tend to be somewhat longer. The majority of domestic planners reported that they take periods into account of more than two years in their planning activities.

Table 8

TIME PERIODS CONSIDERED IN PLANNING
(in percentages)

	Irrigation Planners	Domestic Planners
Less than 2 years	58	33
Over 2 years	<u>42</u>	<u>67</u>
Totals	100 (n = 12)	100 (n = 15)

The differences between the two types of agencies becomes even more apparent when the time periods that receive the greatest emphasis by the planners are considered. The majority of the irrigation planners indicate that most of their attention is given to planning periods of less than one year and only one of these planners indicates that his primary attention is given to any period five years or more into the future. As indicated in Table 9, the domestic planners give substantially more attention to longer time periods than do the irrigation planners.

Table 9

PERIODS RECEIVING MOST ATTENTION IN PLANNING
(in percentages)

	Irrigation Planners	Domestic Planners
Less than 1 year	67	36
1-5 years	25	36
Over 5 years	<u>8</u>	<u>28</u>
Totals	100 (n = 12)	100 (n = 14)

The data indicate that the time periods that are taken into account in planning are generally quite short and that this is even more true in

the irrigation than in the domestic agencies. Similarly, limited resources are allocated to planning activities and the domestic agencies use more resources for planning than do the irrigation agencies. The size of the organizations seems to have a slight impact upon the amount of resources allocated to planning and the length of the time periods considered in the planning process. Generally, the larger agencies expend greater resources on planning than do the smaller agencies and the time periods considered tend to be somewhat longer in the larger agencies. Although this tendency is present in both sectors of the system, it is somewhat more marked in the domestic sector. For example, only one of the irrigation planners indicates that a time period of over 50 years is ever considered in planning while two large domestic agencies indicate that this is the case. This is particularly interesting in the context that most of the planners indicate that they believe that planning activities should take into account problems of 50 years into the future.

The differences in the planning activities of the two types of agencies is highlighted by the kinds of problems that the planners consider to be most important to their agencies in the future. The future problems identified by the planners are quite instructive as to the nature of the future concerns of the organizations which shape the considerations present in the planning process. The planners were asked to rank a number of future problems. An index was created to represent the rankings found in the two types of agencies.³ The irrigation officials tended to choose three problems that they believed to be most significant to the future of their agencies. The most significant problem for the irrigation planners was the maintenance of an adequate water supply and the efficiency

of delivery systems. A greater diversity of significant future problems were identified by the domestic planners. The most significant problem was seen to be the maintenance of an adequate water supply which was closely followed by the maintenance of water quality. A third significant problem was the efficiency of delivery systems. Two problems that were quite significant for the domestic planners and not very significant for irrigation planners were the finding of new sources of water and the maintenance of present rates. The complete rankings and the index scores are presented in Table 10.

Table 10

RANKINGS OF SIGNIFICANT FUTURE PROBLEMS OF AGENCIES

Irrigation		Domestic	
	Points		Points
Protection of water rights	35	Maintenance of adequate water supply	22
Maintenance of water supply	18	Maintenance of water quality	21
Efficiency of delivery system	15	Efficiency of delivery system	18
Protection against greater governmental regulation of activities	8	Find new sources of water	13
Maintenance of water quality	6	Maintenance of present rate structure	12
Find new sources of water	5	Protection of water rights	3
Maintenance of present rate structure	2	Providing for recreational needs of the area	2
Obtaining necessary equipment	1	Obtaining necessary equipment	1
Providing for recreational needs of area	0	Protection against greater governmental regulation of activities	0

These data indicate that the primary interests of the agencies tend to be operational in nature. The greater defensive stand of the irrigation agencies is quite clear with their extreme emphasis upon the protection of water rights and a relatively strong rejection of governmental

regulation neither of which is seen as a very significant problem by the domestic agency planners. The domestic agencies appear to choose problems which involve orientations involving increasing demands upon their services and facilities. These data tend to reinforce the general patterns that have emerged in the analysis of planning activities and orientations discussed above.

Generally, the data involving agency planning activities indicate that planning is a very limited activity in the typical agency. Relatively small amounts of financial resources and limited amounts of time are allocated to these activities. The time periods that are taken into account are generally short even though there is a general commitment present to long range planning. Such planning appears to be beyond the resources and interests of the typical water agency planner who finds himself caught up in a day to day problem of operational planning for short periods of time to meet very immediate organizational problems and goals.

Communications Patterns and Planning Activities

The nature and influence of organizational planning attempts are shaped by the sources and types of communications that are received by the planner from within and outside of the organization and the way in which plans that are developed and communicated to relevant actors within and outside of the organization. A slight majority of all of the planners indicate that they go outside of the organization for information in the planning process, but 70% of them indicate that they do not go outside the organization for advice on future policies for the organization. Therefore, the planners appear to feel freer to go outside the organization for factual and technical information than they do for value premises

to be integrated into their planning decisions. There are no significant differences in the irrigation and domestic planners along these dimensions. However, there is a very slightly greater propensity to go outside the organization both for technical advice and future policies in the domestic organizations.

The relation of the planners to "external others" is in part reflected in their general agreement that there are too many experts that are trying to solve water problems. This tendency is particularly marked in the irrigation sector. As indicated in Table 11, domestic planners evidence a less marked anti-expert attitude than irrigation planners.

Table 11

THERE ARE TOO MANY EXPERTS TRYING TO SOLVE
WATER PROBLEMS
(in percentages)

	Irrigation Planners	Domestic Planners
Agree	79	47
Disagree	<u>21</u>	<u>53</u>
Totals	100 (n = 14)	100 (n = 15)

The anti-expert orientation that is present in the attitudes of the planners is not reflected in the willingness to go outside the organization and receive advice from consultants. The majority of the planners disagree that such an activity is wasteful. The greater willingness of the domestic planners to go outside the organization is again present. The domestic planners show a higher support for the use of consultants than do the irrigation planners. The relative positions of the planners

in the two sectors vis-a-vis the wisdom of using consultants are reported in Table 12.

Table 12

IT IS WASTEFUL TO USE OUTSIDE CONSULTANTS
(in percentages)

	Irrigation Planners	Domestic Planners
Agree	47	31
Disagree	<u>53</u>	<u>69</u>
Total	100 (n = 15)	100 (n = 16)

These data indicate that there is a substantial difference in the orientations of domestic and irrigation planners. The domestic planners are much more willing to look outside of the organization in their planning activities while the irrigation planners show a clear propensity to rely upon internal organizational communications almost entirely as they carry out their planning activities.

The boundaries of an organization may be narrowly defined in a manner which places the users or clients of the organization outside of the organization or they may be more broadly defined in which case these groups become a part of the organization. The attitudes of the planners toward their users seem to indicate that they believe that they are a part of the organization rather than external to it. There is general support for the idea that users should play a larger role in the planning process and more than 80% of the planners support broader user participation in agency planning activities. Similarly, more than 70% of the planners disagree with the contention that too much attention is being paid to the users by their agency. The planners generally

indicate that they frequently discuss organizational problems with their users. This pattern is present in both sectors but there is more reported discussion between the planners and users in the irrigation agencies than in the domestic agencies. This higher level of discussion between irrigation planners and users is shown by the data presented in Table 13.

Table 13

DISCUSSION OF AGENCY PROBLEMS WITH USERS
(in percentages)

	Irrigation Planners	Domestic Planners
Yes	93	63
No	<u>7</u>	<u>37</u>
Totals	100 (n = 15)	100 (n = 16)

Similarly, all except two of the planners indicate that they rely upon users as an important source of direction in choosing future policies for the organization. Although the irrigation planners are less likely to go outside the organization and are less supportive of the contributions of experts and consultants they do evidence a somewhat stronger propensity to consult with their users in conducting their planning activities than do the domestic planners. The users seem to be considered as an integral part of the organization by all of the planners but this orientation is more marked in the irrigation sector. It is relatively important to note that the planners in both sectors generally believe their users would rank significant future problems in the same way as the planners do. This is especially marked in the irrigation sector. However, they believe the general public would have very different interests from their own.

The final issue to be considered involves the recommendations that are made by the planners. Some 60% of the planners indicate that they make their recommendations about future policies to persons within the organization and 40% indicate that they make such recommendations to persons outside of the organization. Approximately two-thirds indicate that their recommendations are generally followed and one-third indicate that these recommendations are generally ignored. There is generally no significant difference between the perception of irrigation and domestic planners as to the likelihood that their recommendations will be followed.

A wide range of kinds of recommendations were reported as being those most likely to be followed or ignored, but a relatively clear pattern emerges as to the type of recommendation that is most likely to be followed and those most likely to be ignored. Generally, the planners believe that recommendations related to very narrow kinds of operational activities or those involving physical facilities are most likely to be accepted. The recommendations which are most likely to be rejected relate to the expenditure of money or the commitment of substantial financial resources. This follows the general patterns developed in Chapter II that the greatest perceived constraints upon the planning activities of the planners is the lack of adequate financial resources to carry out their job and to achieve agency goals.

The data indicate that the primary inputs into the planning process come from within the organization. The users are generally considered a part of the organization and are an important source of planning and decision-making inputs. There is generally a negative orientation toward going completely outside the organization particularly for future policies

but this is less marked in the domestic sector. The planners generally believe that their recommendations are normally heeded and this is most true when these recommendations involve problems of a technical operational nature and do not require excessive financial resources.

Summary and Conclusions

Findings reported in this chapter indicate that there are substantial differences in the planning relevant orientations and activities that are present in irrigation and domestic agencies. The type of agency appears to be the most salient organizational characteristic that influences the nature of planning activities. The size of organization has more limited explanatory power with the general finding being that the larger the agency the greater amount of planning that goes forward, the more resources that are allocated to the planning process, and the longer time span that is considered in the planning activities of the agency.

The irrigation agencies present a pattern of very limited commitment of resources to the planning process. There is a lower level of identification with the abstract value of planning and a greater feeling of futility in these organizations. The planning that goes forward in these agencies tends to be short run in character and involves primarily questions of a technical and operational nature. There is a general perception among the planners in irrigation agencies that they are in a defensive position vis-a-vis the domestic or urban sector and their primary concerns seem to revolve around how to maintain themselves in the face of a growing urban threat. The irrigation planners seem to be more isolated from external influences in their planning activities

and to be more fearful of external pressures. There is a major linkage between the planners and their users. The users are considered as a part of the organization and as sources of information that do not threaten the organization.

The domestic sector is marked by a stronger feeling of effectiveness and a greater commitment to planning and change. There is a general confidence and optimism present in these agencies which seems to be related to an expectation of organizational growth. The resources committed to planning are relatively limited in the domestic sector but generally they are greater than those allocated to planning in the irrigation sector. Somewhat greater periods of time are considered in the planning process and the domestic planners are more interested in problems that are developmental in nature as opposed to those which involve the maintenance of the status quo. There is a greater willingness to receive information and ideas from persons outside of the organization in the domestic agencies than is present in the irrigation agencies.

Chapter IV

EXTRA-ORGANIZATIONAL CONTEXT OF WATER AGENCY PLANNING

The extra-organizational context within which planning activities are carried forward serves as a source of constraints and cues which shape the nature of agency planning activities and influence the effectiveness of agency planning efforts. The major dimensions of this extra-organizational context which are directly relevant for planning activities include the physical resources present in the system, the power relations and authority structures that order and dominate the system, the political and legal parameters of the water resource system, and the attitudinal structures of relevant actors in the external system. This chapter surveys some of the major dimensions of the extra-organizational environment of the planning activities of the local water distribution agencies which are included in our sample.

The measurements of the extra-organizational factors are indirect in nature. The primary measures used to define these factors proceed from the perceptions of the agency planners as to the nature of the constraints which impede or facilitate agency goal achievement. Therefore, basically, reliance in this analysis is placed upon the perceptions of the actors in the planning process as to the presence of and the importance of a number of salient influences present in the external system. Secondly, the perceptions of 118 planning "influentials" that were identified in the course of the study are analyzed to give a broader perspective upon the extra-organizational context of local agency planning. The attitudes and perceptions of these "influentials" serve

directly as a significant source of influence upon the system. Therefore, we look at the extra-organizational context of planning both from the perspective of the planner and from the perspective of the most often indicated sources of authority and information of these planners.

Perceptions of Planners

The physical features of the system as they relate to the availability of water resources and the pattern of demands for these resources are critical components of the extra-organizational context which restrict the options available to planning agents. There is general agreement among the planners in both types of agencies that there will not always be plenty of water available to meet the growing needs of the area. Similarly, they generally believe an important outgrowth of this relative scarcity of resources is that a conflict between farm and non-farm uses is developing rapidly. In this context, the majority of the planners believe that their agencies are facing problems of a different and more serious nature than they have faced in the past. This perception is apparently related to the shifting character of the region--particularly the growing urbanization and attendant shifts in service requirements and resource problems. Therefore, there is general agreement that the local water system is marked by limited and scarce natural resources and that the demands for these resources are rapidly increasing. These conditions are a source of growing conflict between the different sectors of the system and they are creating new and difficult problems for local water agencies.

There are substantial differences between the views of the irrigation and the domestic planners as to the future problems that they will face and how these problems relate to the future strength of their

organizations. Generally, the domestic agency planners have an optimistic view of the future while the irrigation planners tend to see future developments as a threat to their interests and the viability of their systems. One aspect of this difference is reflected in the way that the planners perceive the impact of urbanization upon their organization. As indicated in Table 14, 40% of the irrigation planners believe that continued urbanization is a threat to their organization. No irrigation planner believes that urbanization will strengthen or aid the development of his organization. Conversely, 25% of the domestic agency planners indicate that urbanization will strengthen their organization and virtually none indicate that it threatens their organizations.

Table 14
IMPACT OF URBANIZATION ON THE WATER ORGANIZATION
(in percentages)

	Irrigation Planners	Domestic Planners
No significant impact	6.7	37.5
Threatens the organization	40.0	6.3
Strengthens organization	00.0	25.0
Presents manageable problems	<u>53.3</u>	<u>31.3</u>
Total	100.0 (n = 15)	100.0 (n = 16)

The perceived threat of urban growth on the part of the irrigation planners is reflected in their view that such urban growth should be regulated to preserve the farmer's water. There is substantial support of this view in the domestic sector as well but the intensity of support for control of urban growth that is revealed in the data reported in Table 15 is clearly more concentrated in the irrigation sector.

Table 15

SUPPORT FOR THE REGULATION OF URBAN GROWTH
TO PRESERVE FARMERS' WATER
(in percentages)

	Irrigation Planners	Domestic Planners
Strong support	93.4	31.3
Moderate support	00.0	50.0
Weak support	<u>6.6</u>	<u>18.7</u>
Totals	100.0 (n = 15)	100.0 (n = 16)

These data indicate that the planners perceive that the changes in the nature of the area will have a differential impact upon the viability of the different types of water agencies and that the result will be greater stress upon the irrigation agencies. An alternative strategy rather than to attempt to control or limit area changes is the adaptation on the part of the agencies to meet the changing pressures that are developing. There is a significant difference in the way in which the planners in the two types of agencies evaluate present agency responses to the changes that are occurring in the system. As indicated by the data presented in Table 16, the irrigation planners believe that agencies in the irrigation sectors are changing so rapidly that there are going to be very serious problems in the future. Domestic planners are much less afflicted by this belief. These data indicate a general perception on the part of the irrigation planners that these changes not only will not protect the agencies from growing stress, but that they will further threaten viability of the irrigation organizations. There appears to be a basic rigidity present in the irrigation system. This rigidity represents a perception that the future is relatively bleak

and that there are few innovations that the agency can make to improve future prospects. Domestic planners appear to be more optimistic about the future and are more flexible in their responses to the changes in the system. The irrigation planners see control of environmental changes as a more viable option than agency adaptation while the converse is true for the domestic planners.

Table 16

OTHER AGENCIES ARE CHANGING SO FAST THAT
REAL PROBLEMS WILL RESULT
(in percentages)

	Irrigation Planners	Domestic Planners
Agree	71.4	46.1
Disagree	<u>28.6</u>	<u>53.9</u>
Totals	100.0 (n = 14)	100.0 (n = 13)

Although there is fairly broad agreement among all of the planners that other agencies of the same type are changing too rapidly, this view is much more widely held by the irrigation planners. This essentially conservative view that is evidenced by the irrigation planners is also reflected in and reinforced by their orientations toward significant aspects of water law. The irrigation planners are much more likely to indicate that the maintenance of the water rights of their agency is a significant problem of these agency than are the domestic planners. The data presented in Table 17 show that the maintenance of water rights is a much more important issue in the irrigation than in the domestic sector.

Table 17

MAINTENANCE OF THE AGENCY'S WATER RIGHTS
IS A SIGNIFICANT PROBLEM
(in percentages)

	Irrigation Planners	Domestic Planners
Agree	80.0	37.5
Disagree	<u>20.0</u>	<u>62.5</u>
Totals	100.0 (n = 15)	100.0 (n = 16)

The system of water rights which is present in the system is based upon the prior appropriation doctrine. The predominant use of water in the area has historically been for agricultural purposes. Therefore, the attitudes that support the continued use of this doctrine are related strongly to the maintenance of present rights, allocations, and the status quo. As would be expected, the irrigation planners strongly support the maintenance of this doctrine in its present form while the domestic planners believe that it has outlived its usefulness. This position is clearly represented in the data presented in Table 18.

Table 18

PRIOR APPROPRIATION DOCTRINE HAS OUTLIVED
ITS USEFULNESS
(in percentages)

	Irrigation Planners	Domestic Planners
Agree	7.1	78.5
Disagree	<u>92.9</u>	<u>21.5</u>
Total	100.0 (n = 14)	100.0 (n = 14)

These data indicate that the irrigation planners are intensely committed to a defensive position which is directed against perceived threats to their water supply by non-farm uses. Any changes in the system tend to be looked upon as potential threats to the viability of the organization and a threat to the agricultural sector. Conversely, the domestic planners assume a position which indicates that they believe that there is a need for changes in the system in order that their agencies can meet growing needs that are developing due to rapid urbanization of the area.

The financial resources that are available to the agency shape to a large extent the kinds of planning and decisional activities that can be successfully carried out. As was indicated in Chapter III, there is clearly a strong belief on the part of the planners in all of the agencies that adequate financial resources are not available to carry out appropriate planning activities. This is also reflected in the belief by a majority of the planners that federal and/or state aid would be quite beneficial to the organization. Support for external financial aid is somewhat stronger in the irrigation sector than in the domestic sector. This variation is in part related to a broadly held belief in the irrigation sector that more money is the answer to nearly all of the problems of the organization. The intensity of the belief by the irrigation planners that more money would solve their major problems is reflected in the data presented in Table 19.

Table 19

MORE MONEY IS THE ANSWER TO NEARLY
EVERY AGENCY PROBLEM
(in percentages)

	Irrigation Planners	Domestic Planners
Agree	73.4	31.3
Disagree	<u>26.6</u>	<u>68.7</u>
Total	100.0 (n = 15)	100.0 (n = 16)

Although there is broad support in the irrigation sector for more governmental aid as a means of gaining the financial resources that are considered to be so important for the viability of the organization, there is general rejection in this sector for extending or expanding governmental regulation. There is a general feeling that governmental regulation is a significant source of difficulty for the organization. As indicated by the data in Table 20, there is much greater rejection of governmental regulation in the irrigation sector than in the domestic sector.

Table 20

LESS GOVERNMENT REGULATION AND MORE
PRIVATE ENTERPRISE IS NEEDED
(in percentages)

	Irrigation Planners	Domestic Planners
Strongly support	78.5	50.0
Moderate support	21.5	33.3
Weak support	<u>00.0</u>	<u>16.7</u>
Totals	100.0 (n = 14)	100.0 (n = 12)

These data indicate that the irrigation planners stand in a particularly paradoxical position. They consider that there is greater need for external aid to their organization than do the domestic planners, but they also evidence a stronger rejection of governmental or other external control than do the domestic planners. This places them in a position in which they are both demanding and rejecting governmental intervention simultaneously.

The extent to which external factors particularly political factors impinge upon the planners in local water agencies is in part determined by the attitudes and perceptions held by members of the general public. The way in which the planners relate themselves to the members of the general public influences to some degree the immediate impact of these public attitudes. The data presented in Table 21, indicate that a majority of the domestic planners but only one-third of the irrigation planners believe that the ideas held by the general public should be taken into account in the planning process.

Table 21
IMPORTANCE OF IDEAS OF GENERAL PUBLIC IN PLANNING
(in percentages)

	Irrigation Planners	Domestic Planners
Important	33.3	56.3
Not important	<u>66.7</u>	<u>43.7</u>
Totals	100.0 (n = 15)	100.0 (n = 16)

The attitudes of the domestic planners as to the importance of the ideas of the general public in the planning process are reflected in the communications patterns of the planners. The majority of the domestic

planners report that they often or sometimes explain the activities of their agencies to the general public while only two of the irrigation planners report a similar level of interaction through the explanation of agency policies to the general public. Therefore, these data indicate a much closer linkage between the planners in the domestic agencies and the general public than is present in the irrigation sector. These differences in intensity are apparently related to the kinds of problems which planners perceive the general public would consider as most important in water resource systems. The rankings of problems that the planners believed would be considered significant by the public are described in Table 22.¹

Table 22

EXPECTED RANKING OF PROBLEMS BY GENERAL PUBLIC

Irrigation Planners	Points	Domestic Planners	Points
Recreation	23	Maintenance of Water Quality	16
Maintenance of Water Quality	22	Maintenance of Present Rate Structure	15
Maintenance of Water Supply	12	Efficiency of Delivery System	14
Find New Sources of Water	10	Maintenance of Adequate Water Supply	12
Efficiency of Delivery Systems	15	Find New Sources of Water	8
Protection of Water Rights	4	Protection Against Greater Governmental Regulation	5
Maintenance of Present Rate Structure	2	Protection of Water Rights	4
Protection Against Greater Governmental Regulation	0	Recreation Needs	2
Obtaining Necessary Equipment	0	Obtaining Necessary Equipment	0

Generally, the rankings of problems that would be expected by the domestic planners of the general public are quite similar to the rankings that the planners themselves report they would make of these problems. The rankings of the planners were reported in Table 10, page 49. The major difference is that the domestic planners believe that the public would place more emphasis upon the maintenance of the present rate structures than the planners would. Similarly, they also see water quality to be slightly more important to the public than to them. The rankings for the general public are virtually the same as those the domestic planners would expect that their users would choose. Conversely, the irrigation planners see recreation needs and water quality as important issues for the general public but these problems are seen to be relatively insignificant from the irrigation planning perspective. The irrigation planners apparently believe that their users would rank the problems much as they themselves do, but they expect the general public to have quite different evaluations. This kind of conflict in expectations is not present in the domestic system.

Thus, the perceptions of the planners in both sectors of the water distribution system indicate a broad agreement that the water resources of the area are quite limited and that the conflict over their use is growing. However, the responses of the planners to these agreed upon factors vary substantially between the domestic and irrigation sectors. The growing urbanization of the area is seen as a much greater threat to the irrigation organizations and the planners in these agencies are much more willing to regulate such growth to preserve water for present agricultural uses. Similarly, the irrigation planners evidence a much stronger interest in the maintenance of water rights and preserving the

prior appropriation doctrine upon which they are based. The irrigation planners more strongly feel a need for external sources of financial resources and a much greater fear of regulation by governmental agencies. The irrigation planners feel much closer to their users than do the domestic planners but they are much more isolated from the general public. They communicate at a lower level with the general public and generally see the general public as less important to their activities. Similarly, the irrigation planners see a much greater cleavage between their perceptions of the significant problems in the water resource system and those held by the general public than do the domestic planners.

Communications Linkages

There are varying perceptions of the extra-organizational factors that are present in the water resource system. The activities of the agency planners are shaped to some extent by the variety of sources of communications that are available to them and the perceptions of those they communicate with about the relevant dimensions of the water system. Therefore, an understanding of the nature and significance of extra-organizational factors must include an analysis of the patterns of communications which link the agency planners to the larger system. There is general agreement among the planners in both types of agencies that they should pay more attention to the activities of other agencies engaged in the same functions that they perform, but almost half of the planners in both types of agencies agree that talking to persons outside their organization about organizational problems is a waste of time. This skepticism about the utility of discussing agency problems with outsiders is more marked in the irrigation sector than in the domestic sector.

A number of indexes were created which bring together several communications dimensions. These indexes make possible a broad analysis of the intensity of communications between agency planners and relevant others in the water resource system. One of these indexes is designed to measure the intensity of communications of the planners with relevant actors in the general irrigation system.² It includes measures of the extent of communications with persons in irrigation agencies and officials charged with the regulation and control of the irrigation system components. The data present in Table 23 indicate that there is a relatively high level of communication between irrigation planners and other components of the irrigation system, but there is a relatively low level of communications between domestic planners and persons within the irrigation system.

Table 23

LEVEL OF COMMUNICATION WITH IRRIGATION SYSTEM

	Irrigation Planners	Domestic Planners
High	46.7	00.0
Moderate	33.3	43.8
Low	<u>20.0</u>	<u>56.2</u>
Totals	100.0 (n = 15)	100.0 (n = 16)

The data presented in Table 24 show a very similar pattern vis-a-vis the domestic system. The domestic system index measures the amount of communications between the planners and actors in the domestic system.³ These data reveal that there is a relatively high level of communications between domestic planners and other persons within the domestic system

and that there is substantially less communication between irrigation planners and persons within the domestic system.

Table 24

LEVEL OF COMMUNICATIONS WITH DOMESTIC SYSTEM
(in percentages)

	Irrigation Planners	Domestic Planners
High	20.0	62.4
Moderate	26.7	18.8
Low	<u>53.3</u>	<u>18.8</u>
Totals	100.0 (n = 15)	100.0 (n = 16)

These data also tend to indicate that there are two largely independent systems present in the local water distribution system. There are relatively high levels of communications within each of these systems, but there are relatively low levels of communication between the systems. There appears to be somewhat greater intensity of communications within the domestic system, but the irrigation planners are more likely to report higher levels of communications between the systems than are the domestic planners.

A users index was developed to measure the intensity with which the planners report communications with their users.⁴ The responses to this index are reported in Table 25.

Table 25
 COMMUNICATIONS WITH USERS
 (in percentages)

	Irrigation Planners	Domestic Planners
High	53.4	12.5
Moderate	33.3	43.8
Low	<u>13.3</u>	<u>43.7</u>
Total	100.0 (n = 15)	100.0 (n = 16)

The table indicates a much higher level of communications between the irrigation planners and their users than between the domestic planners and their users. This suggests that the irrigation planners tend to think of their users as an integral part of the agency while the domestic planners are more likely to think of their users as being external to the organization. These differences are probably related to the organizational characteristics that are dominant in the two sectors and to the more critical services performed by the irrigation companies for their users. The services of irrigation companies are very directly related to the economic success of their users.

An index was developed to measure the intensity of communications between the agency planners and local officials.⁵ The relative positions of the two sets of planners on this local officials index are reported in Table 26, and the data indicate substantially greater amounts of communications between local governmental officials and domestic planners than between these officials and irrigation planners. This difference is in part related to the fact that many domestic agencies

are public in nature and, therefore, must report directly to local officials.

Table 26

COMMUNICATIONS WITH LOCAL OFFICIALS
(in percentages)

	Irrigation Planners	Domestic Planners
High	6.7	56.3
Moderate	33.3	37.5
Low	<u>60.0</u>	<u>6.2</u>
Totals	100.0 (n = 15)	100.0 (n = 16)

The final communications index that was developed was designed to measure the intensity of communications between agency planners and state officials charged with substantial responsibilities in the water resource area.⁶ The data presented in Table 27 indicate that there is considerably greater communications between the planners in the domestic sector and these state officials than there is between these state officials and the irrigation planners.

Table 27

COMMUNICATIONS WITH STATE OFFICIALS
(in percentages)

	Irrigation Planners	Domestic Planners
High	0.0	50.0
Moderate	53.3	25.0
Low	<u>46.7</u>	<u>25.0</u>
Totals	100.0 (n = 15)	100.0 (n = 16)

Communications are relatively intense within each sector of the system, but the communications between the two sectors are quite weak. Irrigation planners tend to have substantially lower levels of communications than domestic planners. The major exception to this pattern is that irrigation planners more frequently report intensive communications with their users than do domestic planners. Generally, the irrigation planners are somewhat more isolated from the larger water system than are the domestic planners.

"Influentials" and the Local Planning System

The perceptions and orientations of the local agency planners presented above furnish one significant perspective upon the local water agency planning system and the important parameters of the external system. The following analysis describes these dimensions from the perspective of the persons identified as "influentials" in the local planning system. The perceptions of these persons furnish an additional perspective upon the system that is not so immediately bound by the day to day problems of the planner in the local agency. Similarly, the attitudes of these persons who communicate directly with and influence agency planners serve as an independent set of constraints and influences upon the activities of the agency planners. The first set of individuals identified as "influentials" are those persons whom the agency planners indicated that they communicated with and whose judgment they respected on issues related to water planning activities. A second set of influentials was identified by determining those persons with whom the first set of influentials communicated and whose judgment they respected in local water matters. These two sets of actors will be referred to collectively as influentials in the following analysis. These individuals must be

considered to be important links in the total communications pattern of the local water planning system. They are linked directly to the water planners by communications nets and authority structures through which information, advice, and values flow and which to a large extent define the boundaries of the local planning system.

The individuals who were identified as influentials play a number of roles in the water planning system. There are four general categories of persons represented in nearly equal numbers in the set of actors identified as influentials. The categories are: lawyers, engineers, farmers, and state and local officials. Therefore, they represent a number of skills, interests, and positions that are critical in the system.

The influentials' evaluations of the physical resources that are available for allocation in the system reveal a pattern of deep concern for both the quantity and the quality of water that is available to meet the future needs of the area. All except four of the influentials indicate that they believe that there will not be plenty of water to meet the needs of the area in the future and 65% disagree with the contention that the threats of water loss in the area are exaggerated. Therefore, there is an even more intense feeling among the influentials than among the agency planners that serious water supply problems are present or developing in the local water system. There is also a strong concern over the quality of water that will be available in the area. The majority (57%) of the influentials agree that the quality of water is more important than quantity and two-thirds of them believe that the water supply in the area is seriously threatened by pollution. Thus, the influentials believe that there are significant future problems of water

supply in the area and that these involve both an adequate quantity of water and an acceptable quality of water.

More than 90% of the influentials indicate that the conflicts between farm and non-farm uses are increasing and approximately three-fourths of them believe that the problems of urban and rural areas are so inter-related that they must be solved together. However, a majority of the influentials reject the proposition that urban and industrial growth should be regulated to preserve the farmer's water and that stricter limitations upon the transfer of water should be introduced into the system. Over 70% of the influentials reject the proposition that the prior appropriation doctrine has outlived its usefulness and a majority of them reject the often articulated demand that more restrictions should be placed upon the sale of water rights. These data indicate that while the influentials foresee serious problems of water supply in the future and growing conflicts over water use they are unwilling to take actions that would freeze the water system within its present parameters as a means of dealing with the present and future problems of the water system.

One significant aspect of the perceptions of the problems of the water resource system involves the evaluation of what the most significant future problems will be in the system. Table 28 presents data describing the way in which the influentials rank the most significant future problems of the water resource system in the area.⁷

Table 28

RANKINGS OF FUTURE PROBLEMS

Rank	Problem	Points
1	Maintenance of Adequate Water Supply	208
2	Maintenance of Water Quality	130
3	Find New Sources of Water	93
4	Developing Adequate Planning Programs	92
5	Protection of Present Water Rights	86
6	Efficiency of Delivery Systems	69
7	Protection Against Government Regulation	26
8	Maintenance of Present Rate Structure	2
9	Providing for Recreation Needs	1

Thus, there is clear evidence that the maintenance of an adequate water supply is considered the most significant future problem in the system. The concern over water quality is reflected in that the problem that receives the second highest rate of selection is the maintenance of water quality. The options of finding new sources of water and adequate planning programs gain almost equal support by the influentials. These rankings indicate concern for the availability of water supply in the area of sufficient quality and quantity and suggest that finding new sources of water and better planning programs are significant ways to deal with the problem.

The influentials, like the planners, believe that the general public would rank the most significant problems in a different order. They believe that the public is more interested in water quality than in the general adequacy of the water supply. They also believe that the general public has a substantial interest in recreation needs and the maintenance

of the present rate structure which are values that are ranked in a very low position by the influentials as well as the agency planners. The influentials share the perspective of the planners that the general public would support programs and goals which they feel are less significant in the water resource system. These findings appear to indicate a general feeling in the water planning system that the general public has at best limited understanding of the real problems of the system.

There is unanimous agreement among the influentials that planning is a necessary and important activity and that many of the present problems in the water system are the result of inadequate planning in the past. Less than half of them indicate that water planning in the area has been adequate. There is general agreement that planning should take into account periods of time of fifty years or more into the future. This general commitment to planning among the influentials is reinforced by a belief expressed by approximately 90% of them that there are things that can be done by persons within the system to improve the present situation and an agreement by a majority of the influentials that they themselves could bring about some of the needed changes in the system if they tried.

Over 70% of the persons designated here as influentials indicated that they play a large or a very large role in water planning activities in the area. There is general agreement that both irrigation and domestic water officials should play a substantial role in water resource planning in the area. There is a slightly greater propensity of the influentials to indicate that domestic agencies should play a larger role in planning than is presently the case and a slightly greater propensity to believe that irrigation officials play a larger role in water planning

activities than do the domestic officials. Therefore, generally there exists a belief that the actors should participate more broadly in water planning activities; and despite the presence of fairly broad participation, it should be expanded.

The broad commitment to planning and the belief that there should be broader participation in planning activities are important components of the belief systems of the planning influentials. A closely related question is their evaluation of the sources of the major barriers or constraints upon effective planning in the area. The influentials were asked to rank what they considered to be the three most important barriers to effective planning in the area.⁸ The results of these rankings are presented in Table 29.

Table 29

RANKINGS OF BARRIERS TO EFFECTIVE PLANNING

Rank	Barrier	Points
1	Lack of Financial Resources	330
2	Rapid Urbanization	90
3	Lack of Public Support	82
4	Unavailability of Water Resources	75
5	Lack of Communications Among Water Officials	64
6	Lack of Trained Personnel	58
7	Present Water Law	45
8	Lack of Technical Information	22

Clearly, the influentials see that the most significant barrier to effective planning is the lack of financial resources. This is an

orientation shared by the actual planners. Influentials identify two physical problems as being serious. These are the rapid urbanization and the lack of water resources. Urbanization is seen to be a more serious barrier than the lack of water resources. Very importantly the lack of public support is considered to be a relatively highly ranked barrier to effective planning. This is even more important as it is probably directly related to possibilities of gaining greater financial resources for planning activities. There are no major disagreements as to the more significant barriers to effective planning between those influentials nominated by persons in the irrigation and the domestic sectors.

These data indicate that there is a general agreement among the planning influentials that an adequate water supply is vital to the area and that growing demands for water resources and growing problems of pollution threaten the ability of the system to maintain adequate supplies of high quality water to meet the needs of the area. However, they generally do not support major changes to the present legal parameters of the system, nor do they support attempts to limit regional growth substantially. There is apparently a strongly held belief that effective planning is one of the most important needs in the water system of the area and that such planning activities can substantially contribute to the management of the area's water problems. However, the effectiveness of planning efforts are perceived to be greatly constricted as a result of inadequate financial resources and the lack of public support. There is also some feeling that the lack of communications and coordination among the actors in the water resource system is a serious source of difficulty in any attempts to plan successfully for the future.

Summary and Conclusions

The agency planners generally feel that the water resources of the area are not adequate to meet future needs. This relative scarcity is resulting in growing conflicts between farm and non-farm needs and agencies. The irrigation planners generally take a defensive position which includes support for the regulation of urban growth and the maintenance of the status quo in the water allocation system through the maintenance of the present structure of water rights. Conversely, the domestic planners more frequently support changes and adaptations in the structure and activities of local agencies and shifts in the legal parameters of the system or means of dealing with emerging problems. They tend to reject any controls upon urban growth as a means of conserving the available water supply. This pattern is in part related to the belief widely held in the irrigation sector that urbanization is a threat to their organization. The perceived threat from urbanization is not present in the domestic sector. There is a general belief among persons in the irrigation sector that more money and external financial aid is needed to effectively achieve organizational and planning goals. Governmental regulation is perceived to be destructive to the interests of the irrigation agencies. The domestic planners show less intensity of support for all of these dimensions than do the irrigation planners.

The irrigation planners appear to be much more isolated from the public than are the domestic planners. They support public participation in planning activities less frequently and are more apt to believe that the values and goals held by the general public are different from and incompatible with their own. The domestic planners support greater public participation and believe that the public sees the future problems

much as they do. The communications patterns that were identified indicate that there is fairly intense communication within each of the sectors but very little communications between the sectors. The irrigation planners show a much greater propensity to communicate with their users while the domestic planners more frequently communicate with officials at the local and state levels. These patterns indicate that the sources of the communications for the irrigation planners tend to come from within the irrigation system where they receive generally reinforcing cues which isolate them further from the public and the larger system. The domestic planners appear to have broader based sources of communications; and they are, therefore, more exposed to conflicting cues and substantive information.

The planning influentials evidence deep concern for the adequacy of the future water supply of the region. They see this supply threatened both by growing demands brought about by urbanization and growing problems of pollution. They do not generally accept radical changes in the legal system to meet these threats. They give very little support to regulation of the water system or urban growth to maintain the status quo. They show an intense commitment to planning and a belief that planning is an efficacious means of dealing with many of the future water problems of the area. They consider the lack of financial resources to be the most significant barrier to effective planning activities and they believe that the lack of public understanding of water problems and paucity of public support for water planning are major constraints to the development of effective planning activities and the solution of major water problems of the area.

Chapter V

COMMUNICATIONS PATTERNS AND THE LOCAL WATER PLANNING SYSTEM

The configuration of the local water planning system is defined by the patterns of communications and the authority relationships that are present among the major participants in the system. The actors are indeed relevant to local agency planning and they include the agency planners and those with whom they have communication linkages which are significant for their planning activities as well as those whose judgment the agency planners most respect vis-a-vis water planning matters. The major purposes of this chapter are to identify and to describe the major linkages among those persons whom we have labeled "planning influentials" and to define the ways in which they are related to the planning activities of local water distribution agencies. Major issues that are included in this analysis involve the determination of the kinds of roles played by the planning influentials within the water planning system, the ways in which the primary actors are linked together by communication flows and authority structures, the degree to which the communication patterns between these actors integrate them into the larger water resource system, and the general planning relevant perceptions, attitudes, and orientations that are held by these actors that affect the frequency, content, and intensity of communication flows that may influence the nature of the impact that these influentials have upon local water agency planning activities.

The 118 persons identified as planning influentials play a number of roles in the local water system and they represent a wide range of

educational backgrounds and occupational identifications. The majority of the respondents are proprietors or managers who are engaged in management positions in water agencies or who are local or state public officials. The remainder are nearly equally divided among lawyers, engineers, and farmers. Therefore, these persons represent a broad range of interests and functions which are normally associated with water management problems. Educationally, the influentials tend to report relatively high levels of educational achievement. Over 60% of these influentials report that they are college graduates and only 4% report that they have not completed high school. The level of education reported is strikingly higher than that reported by the local agency planners and this is particularly true in relation to the educational levels reported by the planners in the irrigation agencies. The influentials report a high level of interest in politics with more than 80% reporting that they are substantially interested in political matters. They are generally relatively active in politics with approximately 80% indicating that they hold active membership in one of the two major political parties. Only five of the total indicate that they do not identify with either of the major political parties and 70% of those who report a party identification are Republicans. The influentials are generally active in relevant professional organizations with over 70% reporting active participation in a professional organization. Therefore, generally the influentials are members of a profession in which they are active participants, they have generally high levels of education, they are active politically, and a very substantial portion of them hold positions in governmental agencies at either the local or state level.

Communication Patterns and Authority Structures

The analysis of communications patterns requires that attention be given both to the quantity of the communications and to the probability that information which flows through a given channel will affect or influence the behavior of the receiver of the communication. Therefore, the relationship of the communication linkages to authority roles of the participants is of critical importance.¹ The primary measures utilized for the description of the local planning system combines these two factors. The linkages between individuals are identified and the direction of authority relationships is considered. The analysis determines those actors who play a central role in the local water planning system. The role of the actor is largely dependent upon his position in the communication nets that define the limits of the system. The primary measure used to determine the centrality of the actors is the number of times the individual is nominated as one with whom planning relevant communications are conducted and/or the number of times the person is nominated as one whose judgment the nominator respects on water relevant matters.

The research team conducted extensive interviews with 118 persons who were nominated as persons with whom the planners or their nominees communicated. The persons interviewed were nominated from 1 to 31 times, i.e., they were suggested as influentials by that number of individuals. Fifty of the 118 were nominated by a single individual, forty-four were nominated by two to five persons, and twenty-four were nominated by five or more persons. Those persons who were nominated five or more times are conceptualized as individuals who stand in a central position in the communication net and are, therefore, considered to be the most influential persons in the local planning system.

The source from which the nominations come serve as an independent measure of the centrality of the nominees within the communications system. A part of the nominees were nominated only by persons from within the irrigation sub-system, a part were nominated by persons from the domestic sub-system, and the majority were nominated by persons from each of the sub-systems or by a person with linkages into both sub-systems. The data presented in Table 30 describe the relationships between the number of times the person was nominated and the sector of sectors of the system which were the source(s) of the nominations.

Table 30

RELATIONSHIP BETWEEN NUMBER OF TIMES OF
NOMINATION AND SOURCE OF NOMINATION
(in percentages)

	Irrigation	Both	Domestic	Totals
1 nomination	22	30	48	100 (n = 50)
2-5 nominations	32	57	11	100 (n = 44)
5 or more nominations	12	88	00	100 (n = 24)

These data indicate that those persons who were nominated only once tend to be concentrated in the domestic system. There is a very strong propensity for those individuals who are nominated more than once to receive nominations from a person or persons in each sub-system or from individuals who are linked into both the irrigation and the domestic sub-systems. The eleven people who received the greatest number of nominations (ten or more) all quite clearly have communications linkages into both systems. No persons were nominated five or more times by persons linked only to the domestic sub-system, but three persons were

nominated five or more times by persons who were related only to the irrigation system. These data tend to indicate that the communication system involving the domestic agencies is somewhat more diffuse than the irrigation communications system. The domestic agencies are apparently somewhat less well integrated into the communications patterns which tend to dominate the system. Conversely, the irrigation system is somewhat more highly structured and has better ordered channels of internal communications which are linked more effectively into the larger system. It is hypothesized that these relationships are in part explained by the greater maturity of the irrigation system which over time has developed a number of stable and effective relationships. Similarly, apparently many elements of the domestic system have not established such stable and effective relationships.

The contention that the irrigation officials are somewhat more integrated into the water resource system is supported by data reported below which indicate that the irrigation sector nominees communicate more consistently with state water officials than do domestic system nominees. Therefore, the data suggest that irrigation agencies or at least the persons with whom persons in irrigation agencies communicate are more intimately and effectively linked into the top leadership structure of the water resource system than are the domestic agencies. It was indicated in Chapter IV the planners in domestic agencies tend to engage in greater amounts of communications than irrigation planners and also that domestic communications tend to be more fragmented and diffuse and have more diverse objects than there is present in the patterns of irrigation communications. It must be remembered, however, that the top leadership is clearly and intensely linked to persons who

have linkages within both sectors of the local water distribution system.

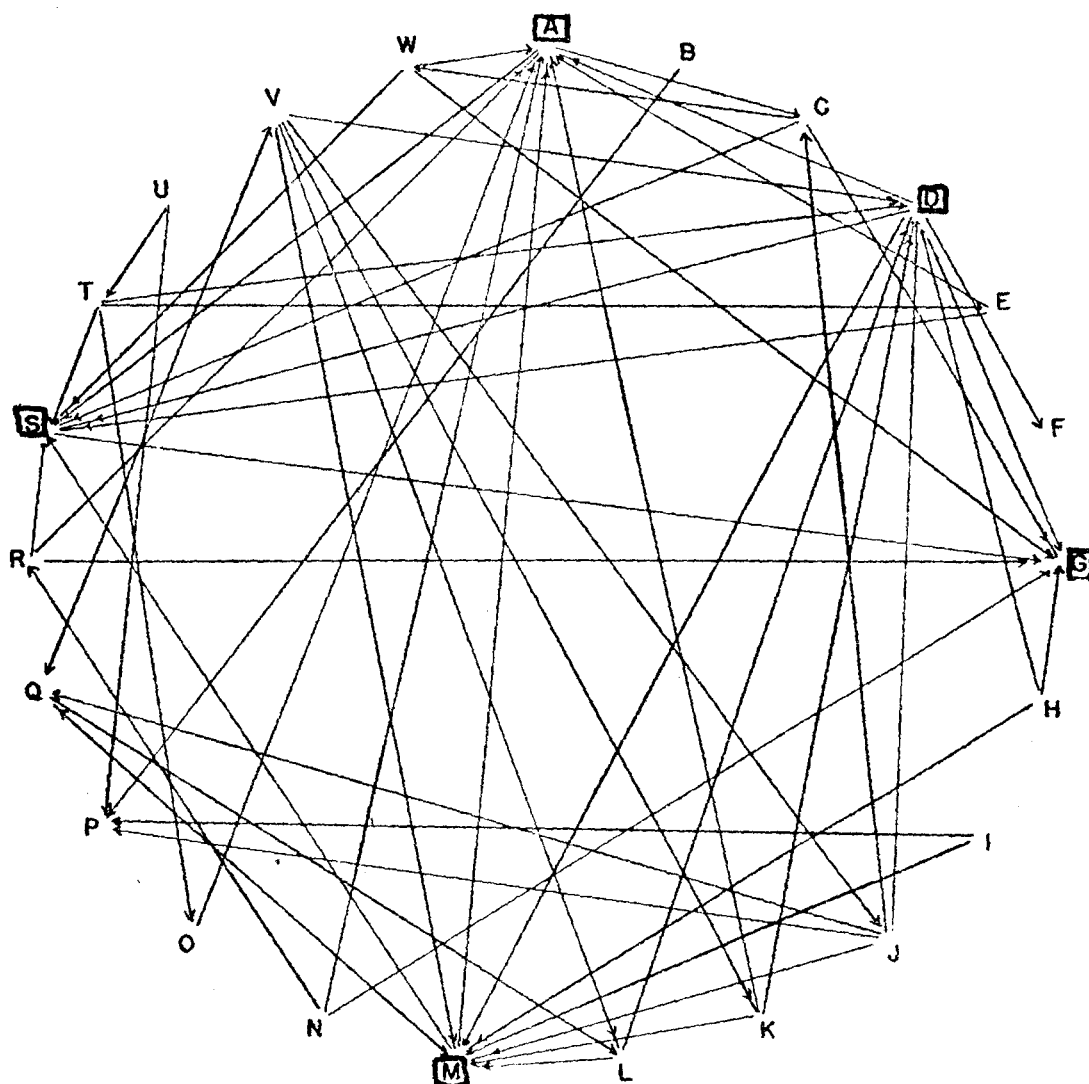
Individuals with five or more nominations constitute the basic core of the communications system that is relevant to planning in local water agencies. They generally have linkages into both the local domestic and irrigation agencies. As individuals they are also important sources of communications for the local agencies; but even more significant, their interactions make them an identifiable group which may serve as a central source of information and cues which flow throughout the local water system. The intensity of communications among these individuals provides a significant mechanism for integration of the entire system.

The linkages among these persons are presented in the form of a sociogram in Figure 2, page 88. This figure traces the linkage patterns of persons who receive the most nominations. These data indicate at least a minimum of linkage in communications between all members of the group. All persons receiving five or more nominations are linked in some manner to at least one other person who received five nominations. The data indicate there is at least a minimum amount of integration within the communications system and that these persons are in a position to play a controlling role in the planning processes of the system.

The contention that these actors play a central role in the area communications pattern is supported in Table 31, page 89. The data reported indicate that there is a significant relationship between the number of nominations that the individual received and the frequency of communications with other relevant actors in the water resource system. This table includes the Gamma value which measures the association between two variables. A high positive Gamma score indicates that an individual

FIGURE 2

SOCIOGRAM OF LINKAGES AMONG MOST
FREQUENT NOMINEES IN LOCAL
PLANNING COMMUNICATIONS SYSTEM



□ MOST FREQUENT NOMINEES

Table 31

RELATIONSHIP BETWEEN NUMBER OF NOMINATIONS AND
FREQUENCY OF COMMUNICATIONS

Positions	Gamma Value	Significance Level	Number Reporting Frequent Communications
State Engineer	.60	.001	30
Federal Officials	.55	.001	25
Bureau of Reclamation	.54	.01	26
Colorado Water Conservation Board	.52	.001	29
State Officials	.52	.001	31
State Legislators	.52	.001	35
U.S. Congressmen and Senators	.50	.01	9
River Commissioner	.44	.001	40
Other Area Officials	.43	.01	21
Local Water Officials	.43	.45	89
Farm Irrigators	.33	.22	58
County Officials	.28	.30	47
Area Leaders	.25	.16	60
City Officials	.25	.43	74
Water Pollution Control Commission	.22	.08	17
Public Health	.02	.32	26

who has a high position on one measure can be predicted to achieve a high position on a second measure. In this case, a high Gamma score indicates that the person who was nominated a large number of times will also have frequent communications with the position under consideration and, conversely, the person who was nominated a small number of times will have less frequent communications. The significance levels reported are drawn from the Chi square test which measures the probability that the distribution could have occurred by chance. A significance level of .001 indicates that the distribution found would occur as a matter of chance only one time in a thousand trials.²

These data yield patterns of communications which identify three sets of communications linkage in the water resource system. There is very clear evidence that the persons nominated five or more times have a much greater propensity to communicate with a number of state, federal, and elected officials than do persons who receive a smaller number of nominations. The relatively high Gamma values and high significance levels demonstrate that the more frequently the person was nominated, the more likely he is to communicate frequently with these officials. A second set involves communications between the influentials and a variety of local officials. The Gamma values indicate that there is still a positive association between the number of times nominated and the frequency of communications with these officials. However, the level of association generally lacks significance. This change apparently results from an increased likelihood that those persons with a low number of nominations will also frequently communicate with these local officials. The number of persons reporting communications at this level is substantially greater than that for the state and federal officials.

Therefore, generally most of the influentials communicate at this level.

The final two agencies stand in a unique position in the system. Relatively low Gamma values and low significance levels as well as small number of persons reporting communications with these agencies indicate that they are at the periphery of the system and the linkages between these agencies and the local water distribution system are relatively weak and/or underdeveloped. These data indicate that in all cases there is a positive association between the number of times nominated and frequency of communications with other actors in the water resource system. Therefore, these data indicate that the persons with greater number of nominations do serve as the central core of information and communications within the system.

A relatively small number of persons indicate communications with state and federal officials. These persons are also those receiving the largest number of nominations. This relationship indicates that communications patterns are dominated by the persons who receive the greatest number of nominations. However, communications are much greater between influentials and local officials. This is reflected in the greater number of persons reporting frequent communications with them. Individuals receiving the largest number of nominations communicate with persons at these levels to a greater degree than persons with fewer nominations. Therefore, the persons with the most nominations communicate throughout the system while persons with fewer nominations tend to communicate only with persons at the local level. The number of nominations received provides a rough index of the communications focus within the system. Hence, a pattern of communications develops

which spirals up from the local to the state and finally to the federal level.

Persons who received five or more nominations clearly provide the central core of the communications system that links together the water resource system of the area. The linkages among these actors are depicted in Figure 2. These individuals play a number of roles in the local water system. The largest number are lawyers (7); there are also four farmers, three state officials, and three consulting engineers. There is a single representative of a local domestic water agency and one federal official. Thereby, the major roles that are generally associated with the problems of water allocation and planning are all represented to some degree among these persons.

The leadership structure is dominated by persons between the ages of 45 and 64. Only two persons are under 45 years of age and four are over 65. Thus, the typical leader is in his middle years. The educational level of these persons is generally high with the vast majority being college graduates and the bulk of them having some graduate education. The college background of these individuals tends to be in the highly relevant areas of law or engineering. Only three of the leaders are only high school graduates and two attended but did not complete college.

Roughly half (11) of the leaders own water rights and an equal number serve in some formal capacity with a domestic water agency. There are five persons who both own water rights and serve in a domestic water agency. Therefore, the problem of water planning is of great personal interest to most of these individuals. Quite importantly the group least likely to fit one of these patterns are public officials who are

charged with formal duties in the water resource area. The leaders generally report that they play a large or very large role in the water planning activities of the area. Only two persons indicate that they play only a small role in such planning activities. Thus, the leaders are generally quite active in water matters and either have ownership interests or formal responsibilities in the water resource area.

The sociogram presented in Figure 2 indicates that five persons among the top ranked nominees are centrally located within the communications flows. These five persons also receive the greatest number of nominations from persons outside of this set of top ranked influentials. They receive more total nominations than any other persons identified in the study. They received from 17 to 31 nominations. They were all nominated by persons in both the irrigation and the domestic systems and from planners as well as nominees of planners. Clearly, these five persons are centrally located in the communications pattern and the authority structure that make up the local water planning system.³

The position of these persons in the system are quite indicative of the similarity between the formal structure of the water management system and the actual patterns of communications and authority roles of the system. Two of the five are state officials charged with substantial responsibilities in the water resource area, two are officials of public agencies which have area wide responsibilities in the water allocation system, and the fifth person has been associated with the most significant water distribution system in the area. These individuals are apparently the central core of the local planning communications system by formal role, by reputation, and by the intensity of communications linkages throughout the system.

The analysis of the communications patterns indicates that a number of persons serve as the focus of the system. These actors clearly engage in greater amounts of communications than do the other persons identified in the study. The differential of communications is most extreme at the state and federal levels where the top influentials tend to dominate the system communications flow. They also communicate with greater frequency with local officials and leaders but the difference is slighter as all of the influentials communicate with greater frequency at this level. However, it appears that they control communications of state and national officials with local officials. The data indicate that as the number of nominations increases, there is movement to higher levels within the system and that the communications patterns are of such a nature that persons who are central in the system are effectively related to elements throughout the system. The extent to which information flows to and from these individuals, they are in a strategic position in a system which provides linkages for the diffusion of such information and cues throughout the local planning system. This is probably one of the most significant findings of the research.

Leadership Orientations

The persons who received the greatest number of nominations play a significant and strategic role in the communications process that marks the local water planning system. They stand in a strategic leadership position within the system. They are in positions that make possible the exertion of substantial influence upon the system. There are substantial communications among these leaders and they are the persons who communicate with the greatest frequency to other actors within the

local and state water resource systems. Similarly, as the data presented in Table 32 indicate, these leaders perceive that they play a quite significant role in the planning processes of the region.

Table 32

ROLE PLAYED IN PLANNING PROCESSES
(in percentages)

	Very Large	Large	Small or None	Total
1 nomination	10	38	52	100 (n = 50)
2-4 nominations	47	37	16	100 (n = 44)
5 or more nominations	50	41	9	100 (n = 24)

The self reported role of the influentials in the planning process closely matches the data on frequency of communications. Those persons who receive the greatest number of nominations differ dramatically from those who only receive one nomination. Half of the persons receiving five or more nominations believe that they play a very large role and 91% report that they play at least a large role in the planning process. Conversely, more than half of those who received only one nomination reported that they play a small role and only 10% reported that they play a very large role in the planning process. Those persons who received from two to four nominations show an intermediate pattern of perceptions. The perceptions of this group are much more similar to those with large number of nominations than those who were only nominated once. These data reinforce the conclusions drawn directly from communications data that those persons who receive the greatest number of

nominations stand in a central and active position in the water planning system of the area.

The same data can be looked at in a slightly different way. The influentials can be divided into groups depending on whether their nomination was made directly by local agency planners, by nominees of the planners, or finally by nominees of nominees of planners. These data indicate a somewhat similar pattern of perceptions. Those persons who were nominated only by planners tended to believe that they played a minor role in the planning process while those farther from the planners and at a higher position in the system tended to believe that they played a greater role in the planning process.

These findings indicate that as one moves up the communications chains away from the planners there is a clear tendency for the persons to believe that they play a larger role in the water planning system. Clearly there is a general belief that the primary planning functions within the system are carried out at points higher in the system than at the level of the local water agency. Thus, the influentials generally do not associate the significant planning activities in the system with the local agencies but with other structures within the water resource system.

The general perception that most significant planning activities do not occur in the local agencies is reflected in the orientations of the influentials toward patterns of participation in water resource planning in the area. Over 80% of those persons who were nominated most often reported that they believed that irrigation officials should play a very large role in water planning while only a slight majority (55%) of those nominated from two to four times supported such participation

and only 49% of those nominated only once believed that irrigation companies should play a very large role in the water planning process. Only 50% of the most frequently nominated persons believe that irrigation companies do play a very large role. Therefore, the most influential members in the sample indicate that they do not believe that the irrigation officials are playing a large enough role in the planning system. Conversely, the other two groups generally report that they believe that the irrigation officials are playing roughly the role that they should be playing in the process. There is a slight tendency for the latter groups to believe that the irrigation officials are playing a somewhat greater role in planning than is appropriate.

The pattern for the domestic system is somewhat different. Those who received the fewest number of nominations are more likely to believe that the domestic agencies should be playing a larger role than they are to support such a role for the irrigation officials. There is general agreement among these persons that the domestic agencies should be playing a larger role in planning than they currently play. Conversely, those persons who are nominated most frequently show somewhat less support for the proposition that domestic agencies should be playing a larger role in the planning process than they do for the proposition that irrigation officials should be playing such a role. There is a slight tendency among these persons to believe that the domestic agencies are playing too large of a role in water planning. It should be added that there is fairly broad support among all of the influentials for broad participation in the planning system for both irrigation and domestic officials. However, there is also general agreement that the general public play only a very insignificant role in the water planning process.

There is a significant difference between those persons receiving the greater number of nominations and those receiving few nominations as to the role they play in water planning. The greater the number of nominations, the greater the probability that the individual perceives that he plays a large role in the planning processes of the system. Similarly, there is a substantial difference in the evaluation of these two groups as to the adequacy of present planning for water resources in the area. The data reported in Table 33 indicate that those persons receiving five or more nominations show the greatest propensity to report that present planning activities are adequate and the persons receiving only one nomination are least likely to believe that present planning activities are adequate. There is apparently a clear relationship between the extent to which the persons believe they play a substantial role in the planning process and their evaluation of the adequacy of that process. The bigger the role played, the more adequate planning appears.

Table 33

ADEQUACY OF PLANNING ACTIVITIES
(in percentages)

	Adequate	Not Adequate	Total
1 nomination	33	67	100 (n = 48)
2-4 nominations	52	48	100 (n = 44)
4 or more nominations	58	42	100 (n = 24)

These data indicate that as we move up the nomination scale toward the leadership positions in the system there is a greater propensity to

find agreement that the present planning activities are adequate. This probably indicates greater satisfaction for persons who participate more in the process and also for those whose perspective is most related to state or area wide activities rather than for those who are primarily local or agency oriented.

Those persons classified as top leaders of the water resource system clearly engage in more intense, frequent, and significant communications with other actors in the water resource system than do those persons identified as influentials in this study. Similarly, these leaders see themselves playing a substantially greater role in planning activities than do the other influentials. The leaders particularly would like to see irrigation officials play a larger role in water planning but are generally satisfied with the role being played by the domestic agencies. These leaders also are the most satisfied with present planning activities and the majority of them believe planning is at least adequate. Persons with the most nominations generally feel more efficacious than others, and believe that they can have a substantial impact on what happens in the water resource system of the area. However, as the number of nominations go up, there is a greater stated desire that more decisions be made at the local level. Seemingly, persons with an area-wide or state-wide perspective of water resource problems would like to see local agencies more active in the planning process and believe that the paucity of local planning is one weakness of present planning activities. These leaders are also the most committed to the limitation of federal intervention and regulation of the activities of the local agencies. However, there is a general rejection of any substantial amount of federal regulation

throughout the influentials with the greatest support for it coming from those who receive only a single nomination.

Attitudes of Influentials

The local water planning asystem is composed of two sectors, i.e., the domestic and irrigation sectors. The influentials in this study were nominated by persons in one of these two sectors or from persons linked to both sectors. A number of differences emerge from the analysis of the orientations of the persons who have primary linkages into different sectors of the system.

Persons nominated from both systems evidence a substantially broader pattern of communications than those persons who have linkages only into one sector of the system. Those persons linked only within the irrigation sector have a slightly greater propensity to communicate in broader patterns than those who were nominated only by persons in the domestic sector. The persons nominated by both systems are more likely to communicate with federal, state, and local officials than those whose nominations were drawn from only one sector. Irrigation nominees have a greater frequency of communications with all of these officials than do the purely domestic nominees. The linkages between persons drawn from the domestic sector and federal officials are particularly weak. Persons nominated by both sectors are the most opposed to federal regulation of local water agencies; but irrigation nominees are also strongly opposed to federal regulation. These data indicate that those who communicate most frequently with federal officials are the most opposed to increased federal regulation while those persons who relate least frequently to such officials are the most favorably disposed to such regulation. This may be

explained in part by a general pattern in which those persons nominated in both systems tend to be somewhat more satisfied with the status quo than are those persons who are drawn from the domestic sector.

There is clear agreement between the irrigation nominees and nominees from both systems that the irrigation officials should play a larger role in water planning activities. The persons drawn from the domestic sector are much less supportive of greater irrigation participation. The irrigators clearly feel they should be playing a larger role in the planning system and they are supported by those persons drawn from both systems. All groups believe that domestic agencies should be playing a larger role. This feeling is intense among those who are nominated only by the domestic system.

On the other hand, persons linked only to the irrigation sector are more supportive of greater participation by the domestic agencies than domestics are supportive of irrigator participation. Persons linked into both sectors generally support broader participation by both domestic and irrigation officials, but there is a slightly greater support among them for irrigator participation as opposed to greater participation by domestics.

Table 34 shows that persons from the domestic sector generally believe that they are playing a smaller role in planning activities than do other persons included in the study.

These data indicate that persons drawn from both systems feel they play a larger role in planning than those drawn from either sector alone. However, the persons drawn from the irrigation system do show a greater propensity to report that they play a larger role than persons drawn from the domestic sector. The larger reported role of the irrigation

Table 34

ROLE PLAYED IN WATER PLANNING ACTIVITIES
(in percentages)

	Large	Small	Total
Irrigation	68	32	100 (n = 28)
Both	80	20	100 (n = 61)
Domestic	52	48	100 (n = 29)

sector buttresses the contention of the domestics that irrigators play a greater role in planning than the domestics themselves. The different perceptions here are clearly related to the general satisfaction present with the current operation of the system's planning processes.

Domestic nominees are generally more supportive of the need for planning activities than are irrigation nominees. Those persons with linkages into both systems are quite supportive of planning activities evidencing a pattern of support quite similar to that held by the domestics. Irrigation nominees are the most supportive of the maintenance of local control over water matters and the persons drawn from the domestic sector show the least interest in the problem of local control.

The persons drawn from the irrigation sector are also the most satisfied with present planning activities and the domestic nominees are clearly the least satisfied. The data presented in Table 35 show this.

The general satisfaction with planning and the intense local orientation on the part of irrigation nominees reflects a general commitment to maintenance of the status quo. Conversely, there is a much more vigorous orientation toward change and dissatisfaction in those persons drawn only

Table 35

ADEQUACY OF WATER PLANNING
(in percentages)

	Adequate	Inadequate	Total
Irrigation	57	43	100 (n = 28)
Both	48	52	100 (n = 61)
Domestic	29	71	100 (n = 29)

from the domestic sector. The greater support of irrigation nominees for the status quo is evidenced in a number of ways. They are much more likely than the other two groups to believe that there should be greater restrictions on water transfers. They also contend that transfers of water rights should be limited. Domestic nominees are the least likely to agree with these propositions. Similarly, the irrigation nominees are much less favorable toward proposed changes in local water law and they are much less likely to conclude that the prior appropriation doctrine has outlived its usefulness. Domestic nominees are the most likely to agree with these changes.

Analysis which uses the source of the nominations as a basis of classification generally supports the findings of those chapters that describe the orientations of the planners in the two sectors. Irrigation nominees tend to be most supportive of the status quo except they are willing to allow the domestic agencies a greater role in planning activities. Domestic nominees apparently want substantial change in the system and feel that they play far too restricted a role in planning activities. They also feel that the irrigation officials play too large

a role. Persons nominated from both systems seem to possess a broader perspective of the system and are relatively supportive of change in the system. They generally support broader participation in planning activities and show a slightly greater propensity to believe that such increased participation is more important for irrigators than for persons in the domestic sector.

The irrigation nominees are the most satisfied with the planning process as presently constituted and the persons from the domestic sector are the least satisfied. Unlike the irrigation planners, the nominees of the irrigation sector have a greater span of communications than persons in the domestic sector. These data suggest that the irrigation sector has developed somewhat more integrated patterns of relationships throughout the local water resource system and that they are relatively well pleased with system organization; and, therefore, they see any attempts to change the system significantly to be somewhat threatening to their interests.

Conversely, the greater intensity of communications of domestic planners tends to represent a more diffuse pattern of communications which does not lead to many of their nominees being clearly linked into the system's dominant structured communications patterns and authority relationships. The relationships developed in the domestic sector appear to be somewhat less mature and well ordered. These factors result in a posture among those in the domestic sector that changes in the patterns and relationships are likely to be favorable to their interests. They tend to demand that they be brought more into the system and they apparently believe that the present organization of the local water resource system is stacked in favor of irrigation interests. They also

tend to believe that the stacking is to the detriment of the needs of the domestic water system.

Summary and Conclusions

The analysis contained in this chapter identifies the primary communications linkages between the major actors who make up the local water planning system. The primary emphasis is placed upon the patterns of linkage among the 118 influentials that were identified in the course of this study. Generally, the data indicate that the number of times a person was nominated operates as an effective index of the centrality of the nominee in the communications process. It also provides a rough gauge of the extent of the individual's role in the planning process.

A total of 24 persons who received five or more nominations were found to play a central role in the local planning communications system. These individuals were interrelated and interlinked with one another by communications channels and authority structures. This group had significantly higher levels of communications with a broad variety of state and federal officials in the water resource area than other nominees. They also had somewhat greater frequency of communications with local leaders and officials than did the other influentials. Therefore, these 24 individuals could be conceptualized or classified as a distinct leadership structure which receives and transmits communications relevant to water planning throughout the region. These individuals provide a central focus for the system and a means for the integration of the system.

Five individuals were found to dominate the communications patterns within this leadership structure. They were also the persons who received

the greatest number of nominations throughout the system. These five either presently do or have held significant formal positions in agencies charged with significant responsibilities for water allocation and management in the area. The centrality of these individuals is one significant indication that the informal patterns of communications and the authority relationships actually present in the system tend to square relatively well with the formal organization of the system.

Persons who received the greatest number of nominations are characterized here as leaders. They perceive that they play a substantially larger role in water planning activities than do other persons interviewed in the course of this study. They are somewhat more satisfied with the adequacy of present planning activities than were the other persons interviewed, and they give particularly strong support to greater participation in the planning process by local agency officials. These leaders would further expand the role of irrigation officials in water planning activities. This seems to indicate that the leadership believes that there is too little participation in planning activities by agency officials and that the agencies themselves should be more involved in planning for the water resources of the region. The implication is that too many planning activities are now being conducted at higher levels in the system and more agency involvement is needed for effective planning efforts.

The bulk of the influentials received nominations from persons related to the domestic and the irrigation sectors of the system. All of the 24 leaders except three received nominations from persons in both sectors of the system. The three exceptions were all drawn from the irrigation sector. The top five leaders were all linked into both sectors

of the system. However, a number of influentials received nominations from only one sector. These persons serve as a basis for comparison of the attitudes between the sectors of the system.

Persons nominated by individuals linked into both systems evidenced broader communications patterns than did persons drawn from only one sector of the system. Individuals nominated only from the irrigation system show more well developed and focused patterns of communications than those that were drawn from the domestic sector.

Persons linked into both sectors generally reported that they played a larger role than others in water planning. The irrigation nominees perceived that they played a larger role with greater frequency than did the domestic nominees. There is a clear base for conflict present in this data as the domestic nominees believe strongly that their role should be expanded and that the role of the irrigation officials should be restricted. This conflict is reflected at least in part by a much greater level of satisfaction with the planning process on the part of the nominees from the irrigation sector. The persons drawn from the irrigation sector are more satisfied with the current state of affairs and are much more likely to support the status quo than are the persons drawn from the domestic sector. The irrigation nominees tend to assume a somewhat more defensive position in the system while the persons with primary linkages into the domestic sector are more apt to support change in a more aggressive manner.

The data reported here indicate that there are two quite separate and independent planning systems at the agency level and that there is very little direct communications between the two systems. The lack of communications and differing interests present sources of real and

potential conflict between the systems. However, the patterns of communications from the two systems do flow into common channels and there is a set of actors central in the process that are linked to persons in both the irrigation and domestic sectors of the systems. These persons serve as channels of indirect communications between the sectors and they, therefore, may serve as a source of at least potentially common cues to be followed in the planning process. The patterns of communications apparently flow in a vertical direction from local agency officials, to local officials and influentials, and finally to leaders with area-wide or state-wide responsibilities and communications linkages. There is seemingly relatively little horizontal communications which directly link the two basic elements of the system together. The leadership structure, therefore, provides an indirect and informal means of integration of the local planning system.

Chapter VI

SUMMARY OF FINDINGS

The water resource system of the United States is experiencing increasing difficulty in attempts to maintain an adequate supply of usable water to meet the needs of an expanding population. The available water supply is being placed under extreme stress which results both from increasing demands for water use and intensifying problems of water quality which grow out of pollution from domestic, agricultural, and industrial sources. The task of adapting the system to meet these increasing pressures successfully is made more difficult by the basic organization of the system for the allocation and distribution of water resources. This system is marked by a state of affairs in which thousands of local agencies make the most critical decisions in the area of water distribution and, thereby, the development of systematic and coordinated policy is difficult. The problem is particularly acute as a significant constraint upon planning for effective water resource utilization. Increased planning activities are frequently cited as essential to deal with the emerging problems in the water resource area.

There is growing interest in water resource planning to bring about more efficient utilization and more effective conservation of water resources. These efforts attempt to make policies today that will direct the pattern of future decisions into a mold which will maximize the fulfillment of the societal goals of achievement and maintenance of an adequate supply of usable water to meet the needs of the population. One relatively significant and generally unexplored segment of this problem

is the planning activities of the many relatively small agencies that actually deliver water to users throughout the country. This study was initially designed to explore the nature of planning activities in agencies of this type and to identify the ways in which these activities are related to the overall water resource system of the area.

The primary focus of the study has been the determination of how planning actually gets done in local water distribution agencies. This analysis included the identification of those factors--personal, organizational and contextual--that influence the nature of such planning activities and the identification of a communication network that links those charged with planning activities into the larger water resource system of the area.

The scope of the study is relatively narrow involving only the agencies in a single seven county area in Colorado. The study is primarily based upon data drawn from systematic interviews conducted with a sample of persons responsible for planning activities in 31 local water distribution agencies. These agencies were selected using a stratified sampling design in which the type of organization and the size of organization were used as the bases for stratification. Planning agents from 15 irrigation and 16 domestic agencies were selected. They were drawn from all sizes of organizations, from the very small to the very large. Extensive interviews were conducted with these persons. Interview schedules were designed to identify the personal attributes of the planner, the types of planning activities that were carried out, the organizational context in which these planning efforts were embedded, and the ways in which the planner was related to persons outside the organization. As a part of this analysis the planners were asked to name those

persons with whom they most frequently communicated and whose judgment they most respected in water planning matters. Those persons identified in this manner were also interviewed and similar questions were asked. A total of 118 planning influentials were identified and subjected to extensive interviews to determine their personal attributes, their role in water planning, and the patterns of communications which linked them to the larger water resource system.

The local agency planners, from the standpoint of personal attributes, comprise a relatively homogenous population. They are relatively older and tend to be approaching the end of their professional careers. They also tend to be long time residents of the area with relatively low levels of formal education; but they have relatively high income levels. They have a record of being rather active in social and civic organizations, but not very active in political organizations. Few have had significant formal training in planning or water relevant fields.

The irrigation planners tend to be farmers whose agency activity is on a part-time basis. They tend to be quite active in farm organizations and associations. Their primary interest is, therefore, agricultural and their water activities are generally instrumental to this major concern.

Conversely, the planners in the domestic agencies are more likely to be full-time employees of a water agency either in a managerial or operational role. They tend to be active in professional water-related organizations and are more likely to see themselves as professional planners or administrators. The domestic agency planner is, therefore, more likely to see his water related activities to be his primary occupational role. They are also more likely to see their organizational role as a direct step in a pattern of occupational mobility in the planning and

management areas. Hence, domestic planners are more characteristically professionals in the areas of management and planning.

All of the planners report that they engage in activities that can be characterized as "planning." They all have favorable views of planning and tend to be supportive of change. They generally believe that successful planning is of vital importance to their organization. However, the typical planner spends a relatively small part of his time actively engaged in planning per se. Their planning roles are generally only one of several organizational roles that they are obliged to perform.

The agency planners are generally satisfied with the amount and quality of information that is available to them to carry out their planning activities, and they tend to be somewhat negatively disposed toward outside experts. They also believe that lawyers play too large a role in local water matters. However, they tend to be favorably disposed toward bringing in outside consultants whose activities are controlled by the agency. There is broad support for local agency autonomy and local control of water matters.

The planners generally see that their major planning activities are related to operational problems of their respective organizations. They also view planning as the making of necessary physical improvements. They consider inadequate financial resources to be the most significant constraint on effective planning and the achievement of organizational goals.

Most of the planners agree that the bulk of their planning activities involve making relatively short-run and operational plans. They generally agree that long-range planning is desirable and necessary, but they also believe that the lack of time and adequate financial resources

preclude extensive activity of this nature. There is a general pattern indicating that the planners will go outside their immediate organization for information and technical assistance which they may need, but they tend to receive their primary cues in regard to values and goals from within the organization. They generally believe that their recommendations are followed. Those recommendations that are operational in character and do not involve substantial commitment of financial resources by the organization are those that are most often accepted.

The irrigation planners tend to be farmers and operate as part-time employees of the organization. Generally, they do not expect any growth in their organization and are relatively satisfied with the scope and size of their organization's activities. They usually consider the preservation of their present position and status in the system to be of greatest importance and see the mechanism of preservation of existent water rights as an essential factor in survival. Irrigation planners communicate at a higher volume with their users than do domestic planners. They are also less likely to go outside the organization for planning information. The irrigation planners are also somewhat less willing to accept a role for outside experts in the water resource system. They are also less inclined to use consultants in their planning activities.

The domestic planners tend to be full time employees of their agency. They tend to function in a managerial capacity. They also give greater support to planning per se and look upon change in a more favorable light than do the irrigation planners. Domestics are more optimistic about the future and display a stronger feeling of personal effectiveness than do the irrigation planners. Domestic planners show a greater propensity to believe that their organization will grow in size and will be

aided by the process of urbanization. They tend to spend somewhat more of their time in planning activities, are more likely to be given a specific budgeting allocation for planning activities specifically, and are inclined to plan for longer periods of time than do the irrigation planners. Domestic planners go outside the organization for advice and technical information more frequently than do irrigation planners and they are more supportive of outside experts and consultants.

There is general consensus among all planners that available water resources are inadequate for future needs of the area. The relative scarcity of water is one of the primary bases of the increasing conflict between the different types of users within the system. The ability of an organization to deal effectively with these growing problems is severely hampered by the lack of adequate financial resources. Planners generally believe that outside financial aid would be beneficial, but there is also a general rejection, particularly in the irrigation sector, of increased external regulation or control.

Irrigation planners tend to be pessimistic about the future of their organizations and they see increasing urbanization of the region as a major threat. They support regulation of urban and industrial growth and place strong reliance upon the maintenance of the present water rights system, and support increasing restrictions on transfers. They tend to support the status quo for the system, i.e., resist basic changes in the system. Although they strongly support outside aid, their rejection of governmental regulation is paradoxically stronger. They believe their users see problems much as they do, but they also believe that the general public has a set of priorities that differs from theirs. Irrigation planners evidence a greater propensity to communicate with their

users, but they communicate less with persons outside their agency than do the domestic planners.

The domestic planners tend to be more optimistic about the future of their organizations and do not see urbanization as a threat to them. They do not support regulation of urban growth and are much more supportive of system change. They communicate more often with the general public and they believe that general public and water user priorities are not strikingly different from their own. They talk more to persons in other agencies and are somewhat more likely to communicate directly with state officials than are the irrigation planners.

The influentials identified in the study play a number of roles in the water resource system. They are lawyers, engineers, farmers, public officials and managers. They generally believe that the serious future problems are water shortage and water pollution. They would not regulate urban growth, but they would emphasize planning activities to deal with emerging problems. They strongly believe that planning is necessary and that it has been inadequate in the past. They also are convinced that many of the present problems are a result of inadequate planning in the past. They contend that the most substantial constraint upon effective planning is low financial resources. The major problems in the area are increasing urbanization and the shortage of water resources and effective planning is necessary if future needs of the region are going to be met.

The analysis of communications patterns among influentials identified 24 interrelated persons who constitute the core of the communications system. Five of these clearly play leadership roles in the water resource system of the area. These 24 persons have more frequent communications with federal, state, and local officials than do the other persons

interviewed in this study. These individuals serve as central links in the communications system of the area drawing from all sectors of the system and dispensing information throughout the system. The actual pattern of communications are quite similar to the formal organization of the system.

These individuals report that they play larger roles in the planning activities of the water resource system of the region than do the other persons identified as influentials in this study. They also support greater participation in the planning activities by other persons in the system, particularly officials of local agencies. They are generally more satisfied with planning efforts as they are presently organized than are other persons interviewed.

The data indicate that irrigators are more effectively linked to the core of the communications system than are persons from domestic agencies. This state of affairs gives rise to greater satisfaction with and support for the status quo on the part of irrigation nominees and greater dissatisfaction with the present state of affairs by domestics.

The evidence is that a relatively well integrated pattern of communications exists in the system that effectively links most of the elements of the system together. Irrigation interests tend to dominate the system. Very little direct communications exist between the irrigation and domestic sectors of the system. The primary communications between these two sectors flow indirectly through the central core of the communications system.

Conclusions

There is broad based support for long-range, effective planning in the local water distribution agencies which is shared by most of the actors in the area's water resource system. Planning activities are carried out in all local distribution agencies, but these activities tend to be short-range and designed to deal with immediate problems of an operational nature. Little effort is made to relate planning efforts to the problems of similar agencies or to the needs of the total water allocation system. Planning activities tend to have a very narrow focus and to be related directly to immediate agency and user problems.

The disparity that is present between the stated support for long-range planning and the general dearth of such activities in the agencies primarily results from a lack of available time for planning by someone who must also perform many other functions for their agencies. It also stems from a lack of adequate financial resources to be allocated to the development of plans and the implementation of decisions designed to effectuate these plans. Each of the local agencies has very limited control over the environment within which it operates and without a great deal of coordination their planning efforts cannot be expected to adequately order the local water resource system. Persons charged with planning activities in the typical local agency spend a very small proportion of their time directly engaged in planning activities; and they have very little specialized training in the techniques and problems of the planning function.

The communications system which links the different relevant planners together is seemingly adequate to diffuse necessary information throughout the system. The planners evidence very little dissatisfaction

with the amount or quality of information available to them. This is in part related to the very narrow concerns involved in their planning activities and very narrow agency perspectives that they bring to these activities. There are sufficient communication linkages between the agency planners and other relevant actors in the system to communicate information and other cues effectively throughout the system, but there is little evidence that the system effectively coordinates the activities of the different agencies within and between the system sectors. Generally, there are quite low levels of communications between persons in the two sectors of the system and this tends both to reflect and intensify the perceived conflict between the system's sectors.

The general water resource system has developed primarily around the needs and interests of the irrigation users and tends to reflect the concerns of this sector most clearly. As a result, the irrigation interests tend to assume a very defensive position designed to maintain the system as currently developed. The domestic interests tend to feel that they do not play an adequate role in the system and, therefore, take a somewhat aggressive position oriented toward bringing about substantial changes in the existing relationships within the system. These factors would be expected to reinforce the actual conflict over scarce resources that marks the system and with the increasing conflict make it even more difficult to bring about coordination between the two sectors. The irrigation which is needed for more effective utilization of water and more effective planning efforts is very difficult to achieve given the present organization and the attitudinal configuration that is present in the system.

The general nature of the system is such that it does not facilitate effective, long-range, coordinated planning efforts. The limited resource base of each individual agency and the very limited range of control of the system available to local agencies militate against extensive changes in the kinds of planning activities carried out by the local agencies. Reorganization of the system and/or external control of planning efforts seems to be required for substantial development of more integrated and coordinated planning efforts in the area and there is strong resistance to these alternatives nearly everywhere in the system. Influentials as well as planners tend to reject any drastic changes to the organization. Conversely, the communications linkages that are present do make possible greater information inputs and values from the local agencies to area wide planning efforts and there is apparently strong support throughout the system to make greater use of the desires and expertise of the agency officials in broader planning activities.

The major dynamic for change within the system is the growing urbanization of the region. The data presented in this study would indicate that the continued intrusion of urbanization and the attendant shift toward dominance of the domestic sector have a number of implications for the water resource planning system of the area. These include:

1. the extension of the planning perspective;
2. the expansion of expertise and skill of water management;
3. transfer of water from agriculture to urban uses;
4. expansion of resources to support planning;
5. transition from a more strictly operational planning orientation to a more generalized and functional planning orientation;

6. transition from a more strictly short-range approach to problem solutions to one which encourages more long-range approaches;
7. Accreting intrusion of the domestic domain on the agricultural power base.

ENDNOTES

Chapter I

¹Raymond L. Anderson, "Emerging Nonirrigation Demands for Water," Agricultural Economics Research, Vol. 17 (October, 1965); 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); Duane W. Hill and R. L. Meek, An Exploration of Components Affecting and Limiting Policymaking Options in Local Water Agencies (Fort Collins, Colo.: Environmental Resources Center, Colorado State University, 1970); Allen V. Kneese and B. T. Bower, Managing Water Quality (Baltimore: The John Hopkins University Press, 1968); Joseph J. Spengler, "Megalopolis: Resource Conserver or Resource Waster?", Natural Resources Journal, Vol. 7 (July 1967); and William E. Warne, "The Water Crisis is Present," Natural Resources Journal, Vol. 9 (1969) for treatments of some of the more significant dimensions of the emerging water problems in the United States.

²Advisory Commission on Intergovernmental Relations, Metropolitan America: Challenge to Federalism, (Washington: Advisory Commission on Intergovernmental Relations, 1966), p. 35. Cf. Abel Wolman, "The Metabolism of Cities," in Cities, (New York: Alfred A. Knopf, 1971), pp. 156-174.

³See, R. L. Meek and John A. Straayer, eds., The Politics of Neglect: The Environmental Crisis, (Boston: Houghton-Mifflin Co., 1971), pp. 165-167, and M. B. McPherson, Prospects for Metropolitan Water Management, (New York: ASCE Urban Water Resources Council, December 1970), pp. 3-19 to 3-23 and 5-1 to 5-14.

⁴See, Wolman, loc. cit.; Advisory Commission on Intergovernmental Relations, op. cit., pp. 30-55; and Gilbert White, "Formation and Role of Public Attitudes," in Environmental Quality in a Growing Economy (Washington: Resources for the Future, 1966).

⁵See, David Braybrooke and Charles E. Lindblom, A Strategy of Decision, (New York: The Free Press, 1963); Charles E. Lindblom, "The Science of 'Muddling Through,'" Public Administration Review, Vol. 19 (1959), pp. 79-88; and R. L. Meek and John A. Straayer, "The Iron Law of Environmental Disorder," in Meek and Straayer, op. cit., pp. 237-243.

⁶See, Gene Bylinsky, "The Limited War on Water Pollution," Fortune Magazine (February 1970), for a typical evaluation of this problem.

⁷See, McPherson, loc. cit.

⁸See, John Friedmann, "A Conceptual Model for the Analysis of Planning Behavior," Administrative Science Quarterly, Vol. 12 (September 1967), pp. 225-252; John M. Pfiffner and Frank P. Sherwood, Administrative

Organization, (Englewood Cliffs, N.J.: Prentice-Hall, 1960); and Herbert A. Simon, Donald W. Smithburg, and Victor A. Thompson, Public Administration, (New York: Alfred A. Knopf, 1950), pp. 423ff.

⁹See, Harold D. Lasswell and Abraham Kaplan, Power and Society, (New Haven: Yale University Press, 1950), pp. 149-150.

¹⁰Cf. Alan Altschuler, The City Planning Process: A Political Analysis, (Ithaca: Cornell University Press, 1966); Melville C. Branch, Planning: Aspects and Applications, (New York: John Wiley and Sons, 1966); David Ewing, The Practice of Planning, (New York: Harper and Row, 1968); and Preston P. Le Breton, Planning Theory, (Englewood Cliffs, N.J.: Prentice-Hall, 1961). The formulation used here is quite similar to those presented in these works.

¹¹See, Chester I. Barnard, The Functions of the Executive, (Cambridge: Harvard University Press, 1938), and Herbert A. Simon, Administrative Behavior, (second edition), (New York: The MacMillan Company, 1957).

¹²See, Alternatives in Water Management, (Washington: National Research Council of National Academy of Sciences, 1966), pp. 37-38 for a discussion of the importance of local water distributors in the total water system. Cf. Vincent Ostrom and Elinor Ostrom, "A Behavioral Approach to the Study of Intergovernmental Relations," The Annals, Vol. 359, (May 1965), p. 140; and Vincent Ostrom, "The Water Economy and Its Organization," Natural Resources Journal, Vol. 2 (April 1962), pp. 55-72.

¹³See, Wolman, loc. cit., and Advisory Commission on Intergovernmental Relations, op. cit., pp. 38-39, for illustrations of this problem.

¹⁴See, 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 discussions of this conceptualization.

Chapter II

¹See, Lester W. Milbrath, Political Participation, (Chicago: Rand McNally and Company, 1963).

²See, Jay W. Forrester, Urban Dynamics, (Cambridge: The M.I.T. Press, 1968) and Jay W. Forrester, "Counterintuitive Behavior of Social System," Technology Review, (January 1971).

Chapter III

¹The General Planning Index was constructed from the responses to four items which measure general support for planning and orientations

toward change. Each of the items was formulated in a manner that the disagreement with the statement indicates a positive orientation toward planning and/or change. Therefore, a respondent who disagreed with an item was given 1 point and a respondent that agreed with the item was given 0 points. Thus, the greatest amount of support for planning and change is present when the person receives four points and the least amount of support is present when 0 points are acquired on the index. The items included in the index are: (1) There isn't much use for me to plan ahead because there is usually something that makes me change my plans anyway. (2) I would rather decide things when they come up than try to always plan ahead. (3) If things are running smoothly, one shouldn't think about changing them. (4) Most new ideas breed a lot of difficult problems.

²The Personal Effectiveness Index was created from four items that measure the general feeling of effectiveness of the respondent and his agency. Respondents who responded in a manner indicating effectiveness were given 1 point of the item and those responding in a manner indicating lack of effectiveness were given 0 points. Therefore, the most effective person would receive three points on the index and the person with the lowest feeling of effectiveness would not receive any points. Agreement with each of the first two items was given 1 point. These items were: (1) It is only wishful thinking that I could change agency policy. (2) Little can be done about most of our agency's problems. Agreement with the third item was given 1 point. This item was: (3) My opinions and suggestions are almost always given fair consideration by my superiors.

³The procedure used to determine the point totals was as follows: Each respondent was asked to select the first, second, and third most significant problem. Three points were given to that alternative that was selected first, two points were given for a second choice, and one point was given for an alternative selected third. The point totals represent the number of times the alternative was selected multiplied by the number of points earned for each ranking.

Chapter IV

¹See, Endnote 3, Chapter III for a description of the calculation of the point totals.

²The Irrigation Communications Index was constructed from four items. Those persons who indicated "a great deal" or "somewhat so" communications with the river commissioner, irrigation officials, and the state engineer were given 1 point for each such response. Those persons who indicated they communicated either "not very much" or "not at all" with each of these were given 0 points. The final item involved how frequently the respondent explained his organization to irrigation officials. Those persons who indicated such activity either "frequently" or "sometimes" were given 1 point and those indicating such activity either "seldom" or "never" were given 0 points.

³The Domestic System Communications Index was constructed from three items. Those persons who reported that they had discussions either "a great deal" or "somewhat so" with persons in domestic water agencies and with city officials received 1 point for each response. Those reporting "not very much" or "not at all" levels of discussion with these persons received 0 points. Those persons indicating that they explained their organization either "frequently" or "sometimes" to domestic water officials were given 1 point and those reporting such explanation only "seldom" or "never" were given 0 points.

⁴The Users Communications Index was created from three items which measure the level of discussion between agency planners and water users. Those persons indicating "a great deal" or "somewhat so" discussion with users in their own agency or in other agencies of the same type were given 1 point for each positive response. Those indicating "not very much" or "none at all" on these items were given 0 points. Those persons indicating that they explained their organizations either "frequently" or "sometimes" to their users were given 1 point and those indicating such activity either "seldom" or "never" were given 0 points.

⁵The Local Officials Communications Index contained only two items. Those persons indicating that they discussed water matters either "a great deal" or "somewhat so" with city officials were given 1 point. Those who indicated either "not very much" or "not at all" were given 0 points. Those persons who indicated they "frequently" or "sometimes" explained their organization to community leaders were given 1 point and those indicating such activity either "seldom" or "never" were given 0 points.

⁶The State Agency Communications Index was constructed from four items. Those persons indicating that they discussed water matters with the members or staff of the Colorado Water Conservation Board, the members or staff of the Colorado Water Pollution Control Commission, and the Department of Public Health either "a great deal" or "somewhat so" were given 1 point for each positive response. Those indicating discussion either "not very much" or "not at all" were given 0 points. Those persons who reported that they explained their organization to state water officials either "frequently" or "sometimes" were given 1 point and those reporting such activity only "seldom" or "never" were given 0 points.

⁷See, Endnote 3, Chapter III for a discussion of the procedure for calculation of these point totals.

⁸See, Endnote 3, Chapter III for a discussion of the procedure for calculation of these point totals.

Chapter V

¹See, Chester I. Barnard, The Functions of the Executive, (Cambridge: Harvard University Press, 1938); Harold Guetzkow and Herbert A. Simon, "The Impact of Communication Nets upon Organization and Performance

in Task-Oriented Groups," Management Science, Vol. 1, (July 1955), pp. 223-250; John T. Dorsey, Jr., "A Communications Model for Administration," Administrative Science Quarterly, Vol. 2, (December 1957), pp. 307-310; and Herbert A. Simon, Administrative Behavior, (New York: The MacMillan Company, 1957), for considerations of the impact of communications processes upon decision-making behavior.

²See, Leo A. Goodman and William H. Kruskal, "Measures of Association for Cross Classifications," Journal of the American Statistical Association, Vol. 49, (1954), pp. 732-764; and Leo A. Goodman and William H. Kruskal, "Measures of Association for Cross Classifications," Journal of the American Statistical Association, Vol. 58, (1963), pp. 310-355, 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. 151-155; John H. Mueller and Karl F. Schuessler, Statistical Reasoning in Sociology, (Boston: Houghton-Mifflin Company, 1961), pp. 262-264; and Dennis J. Palumbo, Statistics in Political and Behavioral Science, (New York: Appleton-Century-Crofts, 1969), pp. 148-156, for treatments of the use of the Chi Square test.

³The persons who appear as the center of the communications system are to a very large degree the same persons who were found to be the top leadership of a decisional system of the Cache la Poudre River in an earlier study conducted by the research team. This study independently reinforces the findings that these persons play a very central role in the local water system of the area. See, Duane W. Hill, Phillip O. Foss, and Roy L. Meek, Organizational Adaptation to Changes in Public Objectives for Management of the Cache la Poudre River System, (Natural Resources Center, Colorado State University, 1969).

Chapter VI

NONE