Bulletin 29:

PUBLIC PERCEPTION OF WATER RESOURCE PROBLEMS

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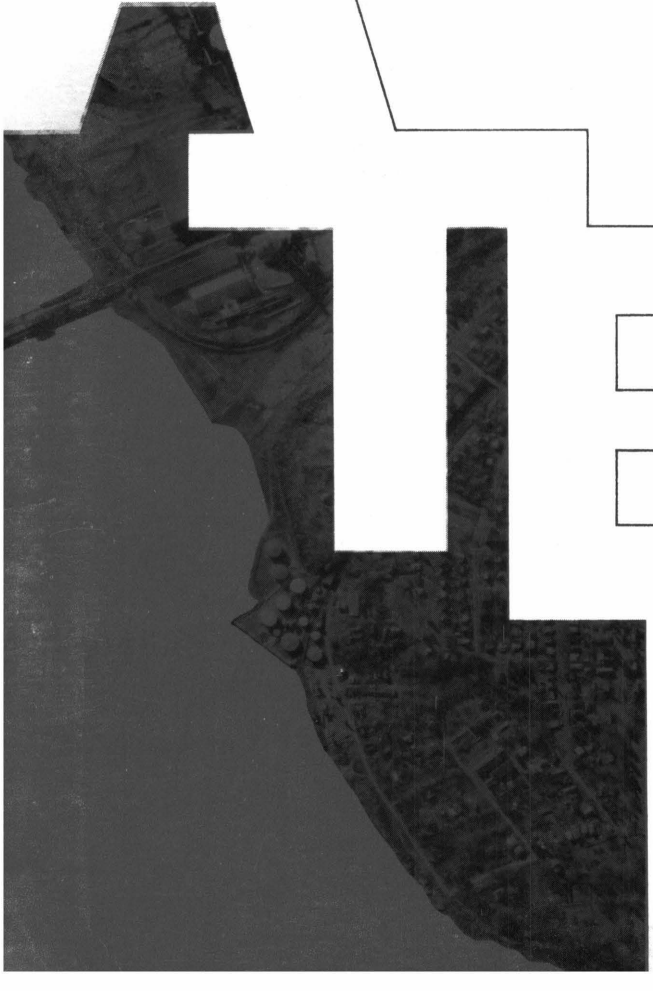

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The work upon which this report is based was supported in part by funds provided by the United States Department of the Interior, Office of Water Resources Research, as authorized under the Water Resources Act of 1964.

Water Resources Research Center
Virginia Polytechnic Institute
Blacksburg, Virginia
September 1969

TD201
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PREFACE

The research report that follows had its beginning following a workshop on the Sociological Aspects of Water Resources Research conducted at Utah State University in April, 1969. Dr. Wade H. Andrews, General Chairman of the workshop and Dr. Roland R. Renne, Director of the Office of Water Resources Research, pointed out a number of areas where social science research would facilitate the implementation of the more technical aspects of water problems.

The present study serves as a pilot for one of these areas: perception by the public of water problems. An attempt is made to provide empirical data which might provide insight into the problem. A professional interviewer gathered the data in Montgomery County, Virginia, during March, 1969. In the first section, the research problem is introduced. The second section examines past research efforts that have a bearing on both the formulation of the problem and a projection toward expected findings. The third section focuses upon the specific methodology of the study and characteristics of the sample population. The fourth, fifth, and sixth sections examine three components proposed for investigation: the ways in which the public appears to perceive water problems, the correlates of the problem perception, and the public view on the matter of what action should be taken to correct problems. The seventh section contains summary and conclusion data, while the final section presents recommendations to the profession.

A number of persons provided both technical assistance and guidance in the preparation of this project. The authors express their appreciation to Dr. Robert King of Virginia Polytechnic Institute for his technical assistance and Dr. Lee Taylor of Cornell University who served as consultant in the preparation of the research instrument.

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INTRODUCTION AND THE RESEARCH PROBLEM

Increasingly, research attention has been directed toward the quantity and quality of water resources as these significantly relate to the well-being of man in society. At present the vast majority of water resource research projects has been of a technical and economic nature, while the social aspects of water resource problems have been neglected or excluded from consideration. The social aspects of water resource problems are most complex and far reaching, but can generally be classified under two general headings: The first is water as a biological need of the organism. The human learns to recognize the importance of arranging for and providing an available source of potable water. This he achieves collectively through institutional means with only limited recognition of techniques and agencies involved.

The second heading concerns an extension of man's need for water as this requirement is culturally defined. Thus, water is used by man for recreation, health needs, industry, and agriculture in the sense that man attempts to manipulate the natural water resources to achieve several goals which he values. At the present time, water is a "problem" for man primarily because of the culturally defined extension of his water needs.

For those who work directly in man's attempt to manipulate his water resources, water constitutes a problem of daily concern. For the general public, however, water is more or less taken for granted as a "given" in its environment. The expert who recognizes various water problems, present and potential, may be perplexed by public apathy toward a problem which is very apparent to him. Furthermore, the efforts of the expert to educate the public concerning water problems are often frustrated by the seeming refusal of the public to seriously entertain the expert's definition of a water problem. This public perception of water as a natural right of man and the lack of willingness on the part of the public to view water as a problem make it very difficult for the expert to introduce and implement various action programs which he may view as necessary to conserve and utilize present and future water resources.

The acceptance of action programs by the public is largely determined by the extent to which the public:

1) is aware that a problem exists

2) believes that the problem represents a threat to the continuity or well being of the community

3) believes that corrective action is possible and practical.

One of the major areas of concern for public planners is the communication of ideas relating to the existence of a problem and the presentation of possible alternative solutions to the general public. Specifically, it can be stated that a citizen responds not directly to a stimulus but rather to the meaning he attaches to that stimulus. In the case of the water expert's definition of a water problem and his program for dealing with the problem, the public's perception of water as a problem and how this perception is formed is of vital importance for the expert to understand, if his expertise is to be brought to bear on the problem.

As an initial effort to gain insight into the relationship between the perception of water problems by the public and the attempts of the water expert to deal effectively with water problems, this study was concerned with the following research question:

<u>What are the factors related to the public's perception of water problems?</u>

Specifically, an attempt was made to determine to what extent the public perceives water as a problem, what is the basis of a problem perspective, and what action the public feels should be taken toward the solution of the problems perceived.

RELATED RESEARCH

Research on the sociological factors related to water problems is noticeable by its scarcity. The major proportion of sociological commentary on water problems has been made not by the sociologist but by the engineer, the manager, the politician, the business leader, and the leadership of various interested organizations. This commentary most often takes the form of opinion or belief based on values which the particular individual or interest segment wishes to promote.[1]

Perhaps the most pertinent research effort related to the problem under study here is the recently completed public opinion poll conducted by the Gallup organization for the National Wildlife Federation.[2] Sampling the opinions of 1,503 citizens in various parts of the United States, Gallup found that 32% were of the opinion that water pollution was the most pressing environmental problem. About half (51%) indicated that they were "deeply concerned" about the abuse of their natural surroundings. Almost three out of every four persons interviewed indicated they would be willing to pay additional taxes to improve their natural surroundings.

Gallup found that those with higher education attainment, men more than women, and those living in the western and midwestern states, were most likely to voice concern about problems affecting the environment.

With regard to water pollution, Gallup found that the most frequently mentioned corrective action suggested by his respondents was to stop industrial pollution with the enforcement of present laws and the enactment of new legislation.

The findings of Gallup are of interest in that they do indicate public concern and awareness of water problems, in this case, the problem of water pollution.

In a study concerned with the identification of factors affecting consumption of urban household water, Gardner and Schick isolated water cost and lot size as the two most important factors.[3] They found no significant relationship between median income per capita, value of homes per capita, precipitation rates and temperature, and water consumption.

Spaulding conducted a study similar to the Gardner and Schick effort in the city of Warwick, Rhode Island.[4] He reported that higher status

households use more water than lower status and that house value and household income are significantly related to amount of water use. A related finding was that household size is positively related to water consumption. Spaulding also suggests that prediction of amount of water needed to support suburban communities should be based on factors of social status as well as population.

Recognizing the importance of community leaders in the process of solving water problems, Shanley studied community leader attitudes on water pollution abatement.[5] The leaders' studies agreed that some sort of regional action was needed to solve the problem of pollution and considered that present efforts to cope with the problem were ineffective. Drinking water supply, pollution, and refuse disposal ranked among the top three problems in each of the communities studied, as viewed by the community leaders.

Booth and Voeller conducted a study of the social impact of drought in Illinois and conclude that drought tends to have a variable impact.[6] As might be expected, Booth and Voeller found that the more severe a drought becomes, the more general its impact on society. The variation of the impact seems to depend on the perceived water needs of various segments of the population. They also found evidence that a situation of drought can actually increase the amount of water demanded in an area.

Wilkinson and Cole analyzed some sociological factors related to watershed development in Mississippi and suggest that watershed development, in the case studied, was primarily an undertaking of special-interest groups utilizing state and federal agencies.[7] They suggest that the "interactional approach" may provide a useful general frame of reference for sociological study of water problems. Wilkinson and Cole also include a section on the review of sociological studies of water resources action, which constitutes a significant contribution on its own.

The above review of related research is intended to be representative of previous efforts related to the sociological study of water problems rather than being a comprehensive review. There also exist several significant statements of the need for increased sociological research into water problems which are suggestive of specific research problems.[8]

SPECIFIC METHODOLOGY OF THE STUDY AND CHARACTERISTICS OF THE SAMPLE POPULATION

Design of the Research

Selection of a sampling universe and an appropriate technique for collection of data are two fundamental problems of research design. The section which follows describes the study area, the selection of the sample, and selected characteristics of sample subjects. Both the technique and study area were designed to achieve objectives outlined in the previous section.

The Study Area

The study was conducted in Montgomery County, Virginia, in the southwestern part of the state with 350 square miles of land area and a population in excess of 50,000 persons. Historically, a majority of county inhabitants have been rural. The three communities of Radford,[9] Christiansburg, and Blacksburg, located within county boundaries, have an aggregate population of slightly greater than one-half the total population of the county. The more recent trend in population change has followed the national pattern of movement from rural farm to residence within or near one of the population centers.

A major activity within the county is higher education; two of the larger state supported educational institutions are located in Montgomery County. These institutions increase population by about 15,000 persons while school is in session. In addition, faculty of these schools provide a component of the labor force that contrasts in educational attainment with the rural farm and industrial workers.

The mountainous and wooded terrain of the county lends itself neither to large scale farming operations nor to extensive industrial enterprises. A civilian labor force of slightly under 20,000 persons was reported in 1964, with a munitions manufacturer serving as the largest single employer.[10] The remainder of the work force is scattered in a variety of smaller textile, furniture and durable goods manufacturing plants.

Montgomery County is located on the divide between the Roanoke River Basin and the New River Basin. Surface water flows eastward from the

ridge and valley areas to the Roanoke River and westward to the New River. Elevation ranges from 1,800 to 3,700 feet above sea level. Precipitation amounts to about 43 inches per year.

Several water and sewage systems are in operation within the county. While a portion of the county's inhabitants receives their water supply from privately owned wells or from mountain streams, the majority is served by a network of waterworks systems which process river water or pump a limited amount from community owned wells and encased limestone springs. Water processed for use within communities is fluoridated and varies in hardness from 2.5 to 4.5 grains per gallon. Sewage treatment plants serve the three communities with effluent discharged into streams.[11]

Research Technique

Any data-gathering technique is more appropriate in certain research designs and not in others. Telephone interviews were selected as the data-gathering technique in order to achieve several objectives and to utilize newly developed approaches to that method of data gathering.[12] First, telephone surveys provide an economical technique for gathering data from a relatively broad based sample population.[13] Secondly, research indicates that telephone surveys are an efficient method for gathering accurate data when a structured questionnaire, of the type used with the present study, is employed.[14] A third advantage of the telephone survey technique is speed.[15] It is possible to complete a greater number of interviews in a limited time span. This third consideration was particularly relevant with the present study since an attempt was made to elicit the perception of water resource problems at a given point in time and through the various communication media that were available to the respondent. It is possible for communications media to give greater attention to water problems at one time than another. Thus, decreasing the time interval by the use of a telephone survey afforded greater opportunity for all respondents to be exposed to similar information from the mass communications media.

While there are distinct advantages to the telephone survey technique, corresponding disadvantages are similarly evident. Of primary importance are limitations on the ability to contact a respresentative sample of the population universe. Persons who do not have a phone in the home or who are not listed in the telephone directory are automatically eliminated from inclusion in the sample. The severity of this limitation has diminished as the telephone has become a more standard household item; telephone saturation

approaches 100 per cent in certain areas. It is reported that 97 per cent of the households in Evanston, Illinois have phones, while the corresponding figure for Monroe, Michigan is 95 per cent.[16] Evidence indicates that rural households are less likely to have telephone service than urban homes, and that regional differences are similarly evident. For example, only 19 per cent of the Alabama farm homes have phones while the corresponding figure for Connecticut is 94 per cent.[17] Furthermore, homes without phones are likely to be occupied by persons from the lower socio-economic classes. Data on telephone saturation tend to suggest that a phone survey sample is likely to be under-represented in its proportion of poor, rural residents.

It is similarly possible for a household to have a telephone but not have it listed in the telephone directory. An Ohio survey designed to ascertain reasons for non-listing indicated that the most frequent single cause was the installation of a new phone after the directory was published.[18] A more recent study by Cooper in Cincinnati indicated that 18 per cent of the total phones in service at the end of a directory year were not listed in the directory prepared for that year.[19] Change of residence was indicated as the primary reason for non-listing. This is in line with Census Bureau reports which suggest that 20 per cent of the population is involved in a change of residence each year. While residence change must be considered as a reason for exclusion from the sample in the present study, it should be noted that the directory was published less than two months when the samples were drawn.

A further limitation involves the availability of cross-section of age and sex components for households samples. While this problem is present with personal interviews and mail questionnaires as well, it is important as a consideration in the present study. Since a male household member is more likely to be at work during the day hours, surveys conducted during these times are likely to be over-represented with female respondents. Furthermore, older and retired residents are more likely to be at home during the day while in the younger segment of the population, both husband and wife may be employed outside the home. For the present study, 80 per cent of the contacts were made during evening and weekend hours with only 20 per cent during the day. This step was taken to assist in obtaining a broader cross-section of younger and older as well as male and female respondents.

Sampling Procedure

The sample frame was drawn from names that appeared in the Montgomery County telephone directory published in November, 1968. By use of a table of random numbers, the specific starting entry and subsequent entries on each page of the directory were selected until a representative sample of each column and page had been drawn. A total of 748 names appeared on the original listing. This number was reduced to 592 when commercial establishments and non-residence phone numbers were removed. Disconnected numbers accounted for an additional 30 names that were removed from the list. Thus, a total of 562 residence phones was available for sampling purposes. It was decided that three attempts would be made to contact a potential respondent. After three calls, no answer was received from 91 numbers. The number of respondents was further reduced by 18 persons who refused to participate in the interview after they were contacted by phone. With the reductions indicated above, the completed interviews totaled 453 subjects; this number constitutes the sample population for the study.

All interviews were conducted by a single trained interviewer who also carried out a pre-test of the instrument. A total of 13 pre-test interviews was completed but not included in the sample. The interview schedule was restructured after the pre-test to incorporate recommended changes and to facilitate communication between the interviewer and respondent.

A semi-structured and pre-coded schedule was used to obtain information from the 453 respondents. A total of 66 questions was posted, ranging from questions about perception of problems in society to personal information about the respondent for classification purposes. Average time for completion of an interview was 20 minutes. While it might have been possible to broaden the scope of the questionnaire by including additional questions, experience with the pre-test and suggestions in the research literature indicated that brevity was desirable.[20] It is well to note that no interview was partially completed; any respondent who did not refuse to be interviewed answered all questions posed.

Selected Characteristics of Sample Subjects

The 453 sample subjects were nearly equally divided between male and female respondents. As shown in Table 1, a total of 224 men and 229 women were interviewed.

TABLE 1

SEX OF RESPONDENTS
N=453

Sex	Number of Respondents	Percent
Male	224	49.4
Female	229	50.6
Total	453	100.0

By far the greatest proportion of sample subjects was married. Data presented in Table 2 show that 358, or 79 per cent of the respondents were married while only 47, or 10 per cent were single. The remaining 10 per cent consisted of 37 widows and widowers, 9 divorced persons and 2 separated individuals.

No attempt was made to categorize the sample population according to race. The question of race or ethnic background was not included in the questionnaire for two reasons. First, the telephone interview does not lend itself to gathering this information, and secondly, the proportion of non-white residents in the area is minimal. Census Bureau figures indicate that less than 5% of the Montgomery County residents are Negro, and there is not an appreciable number of persons from any specific ethnic group in the county.

The median age of respondents was 38 years. It was found that only 18 persons were under 21 years of age while 182 reported an age between 21 and 35 years. The later category contained slightly over 40 per cent of all sample subjects. The remaining categories were as follows: 71 persons--36 to 44 years of age, 66 persons--45-54, and 115 persons over 55. One "young" lady was reluctant to disclose her age to the interviewer and is reported in the "refused" category. The data can be found in Table 3.

A number of questions were posed to respondents regarding their place of residence at present and in the past. This information was collected in an attempt to associate area of residence with the perception of water resource problems.

It was found that nearly three-quarters of the respondents lived in a town or city while the remaining one-quarter resided in a rural area (Table 4). As shown in Table 5, nearly one-third of the respondents (143) lived at the same address for over eleven years. In fact, the population was nearly equally divided between those who had moved in the past five years and those who had lived at the same residence for over five years.

Checking all persons who had moved, as shown in Table 6, it was found that for 187 or 41 per cent, the previous residence had also been in Montgomery County. An additional 36 persons lived in another Southwest Virginia county while 61 respondents lived in other parts of Virginia. When these figures were combined with the 99 persons who had never moved, the totals indicated that over four-fifths of all respondents had a Virginia background.

TABLE 2

MARTIAL STATUS OF RESPONDENTS
N=453

Marital Status	Number of Respondents	Percent
Married	358	79.0
Single	47	10.4
Widow or Widower	37	8.2
Divorced	9	2.0
Separated	2	0.4
Total	453	100.0

TABLE 3

AGE OF RESPONDENTS
N=453

Age	Number of Respondents	Percent
Under 21	18	4.0
21 to 35	182	40.2
36 to 44	71	15.7
45 to 54	66	14.6
55 or over	115	25.4
DK/ref.	1	0.2
Total	453	100.1

TABLE 4

RESPONDENTS ACCORDING TO PLACE OR RESIDENCE
N=453

Locality of Residence	Number of Respondents	Percent
Rural	122	26.9
Town or City	331	73.1
Total	453	100.0

TABLE 5

LENGTH OF TIME RESPONDENT RESIDED AT PRESENT ADDRESS
N=453

Length of Residence	Number of Respondents	Percent
Less than one year	99	21.9
1-2 years	70	15.5
3-4 years	57	12.6
5-6 years	36	7.9
7-8 years	14	3.1
9-10 years	18	4.0
11 or more years	143	31.6
DK/ref.	0	0
Total	453	100.1

TABLE 6

LOCALITY OF PREVIOUS RESIDENCE OF RESPONDENTS
N=453

Locality	Number of Respondents	Percent
Never changed residence	99	21.8
Same area (Montgomery County)	187	41.3
Southwest Virginia	36	8.0
In Virginia but not Southwest	61	13.5
Another state - East	23	5.1
Another state - Midwest	13	2.9
Another state - South	21	4.6
Another state - Mountain	5	1.1
Another state - West	6	1.3
Overseas	1	0.2
DK/ref.	1	0.2
Total	453	100.0

The migration trend from rural to urban residence is shown in Table 7. When compared to Table 4, data show that while nearly one-third (142 persons) had a rural residence in the past, the present proportion has decreased to slightly over one-quarter (122 persons).

Returning to consideration of the present home, it was reported that 317 persons (70 per cent) were home owners while 136 or 30 per cent were renters. These data are reported in Table 8. Further refinement of residence type, as shown in Table 9, discloses that nearly three-quarters of the respondents lived in multiple units. The somewhat mobile nature of a segment of the population is shown in the report that 36 respondents lived in house trailers.

The occupational involvement of the sample population was quite varied. Professional or proprietor occupations were reported by 98 persons, with six of that total retired; an additional 39 persons held, or had held, occupations in the sales or clerical areas. Skilled workers accounted for 37 respondents while 34 persons held semi-skilled jobs. There were 24 service workers and 13 skilled jobholders with only 7 respondents reporting farming as their occupational category. Housewives with no occupational involvement outside the home totaled 140. The relatively high number of students (53) is accounted for by the presence of two institutions of higher learning in the area. Both institutions operate graduate departments which brings a migration of slightly older students. The remaining respondents were: 4 disabled, 2 unemployed and 2 retired persons who were unable to select an appropriate occupational category.

The range of educational background was extremely broad (Table 11). At the lowest end of the educational scale were 64 persons who had attended grade school for some period of time, but had not completed elementary school. An additional 24 respondents completed elementary school while 73 persons attended high school. High school graduates represented nearly one-fifth of the sample with 97 persons and an additional 12 persons attended business or trade school. A relatively high proportion of respondents attended or graduated from college. The figures are as follows: 88 attended some college, 55 were college graduates and 39 attended or completed graduate education. This high proportion of college graduates again reflects the specific make-up of the area and contrasts with the relatively high proportion of persons with low educational attainment.

As with occupation and education, there was no heavy concentration of respondents in a single category. As shown in Table 12, nearly one-fifth of the

TABLE 7

LOCATION OF PREVIOUS ADDRESS OF RESPONDENTS
N=453

Area	Number of Respondents	Percent
Rural	142	31.3
Town	288	63.6
City	22	4.9
Other	1	0.2
Total	453	100.0

TABLE 8

OWNER-RENTER STATUS OF RESPONDENTS
N-453

Respondent Owns his Home	Number of Respondents	Percent
Yes	317	70.0
No	136	30.0
DK/ref.	0	0
Total	453	100.0

TABLE 9

TYPE OF RESIDENCE OF RESPONDENTS
N=453

Type of Residence	Number of Respondents	Percent
Single dwelling	338	74.5
Multiple dwelling	79	17.4
Trailer house	36	8.0
Total	453	99.9

TABLE 10

OCCUPATION OF RESPONDENTS
N=453

Occupation	Respondent's Occupation	Percent
Salaried professional	58	12.8
Professional, retired	3	0.7
Salaried Manager, Official or Proprietor	27	5.9
Self-employer manager, official, or proprietor	7	1.5
Manager, official, or proprietor, retired	3	0.7
Retail salesman	4	0.9
Salesman, retired	1	0.2
Clerical	33	7.3
Clerical, retired	1	0.2
Skilled manufacturing workers	15	3.3
Skilled construction workers	6	1.3
Other skilled workers	13	2.9
Skilled worker, retired	3	0.7
Semi-skilled workers in manufacturing	24	5.3
Other semi-skilled workers	7	1.5
Semi-skilled workers, retired	3	0.7
Service workers	23	5.2
Service workers, retired	1	0.2
Unskilled manufacturing laborers	5	1.1
Other unskilled laborers	7	1.5
Unskilled laborers, retired	1	0.2
Farmer	4	0.9
Farmer, retired	3	0.7
Housewife	140	30.9
Disabled	4	0.9
Student	53	11.7
Unemployed	2	0.4
Retired	2	0.4
Total	453	100.0

TABLE 11

EDUCATION OF RESPONDENTS
N=453

Educational Level	Number of Respondents	Percent
Some grade school	64	14.2
Finished grade school	24	5.3
Some high school	73	16.1
Trade or Business School	12	2.6
Some college	88	19.4
Finished College	55	12.2
Post-graduate school	39	8.6
DK/ref. or respondent is male	1	0.2
Total	453	100.0

TABLE 12

FAMILY INCOME OF RESPONDENTS
N=453

Income	Number of Respondents	Percent
Under $3,000	88	19.4
$3,000 - 4,999	69	15.2
$5,000 - 7,499	84	18.5
$7,500 - 9,999	80	17.7
$10,000 - 11,999	47	10.4
$12,000 - 14,999	30	6.6
$15,000 and over	34	7.5
DK/ref.	21	4.6
Total	453	99.9

respondents (88 persons) had an income under $3,000 per year. At the opposite end of the income scale were 34 respondents with an annual income of over $15,000.

In summary, the sample population is nearly equally divided between male and female respondents, a majority of whom have lived most of their life in Montgomery County or in the surrounding area. Many are homeowners who live in single unit residences in one of the three communities located in the county. Respondents display a wide range of educational, occupational and income differences.

The sections that follow attempt to assess differences in perception of water resource problems based upon personal and social characteristics reported in the interview.

PUBLIC PERCEPTION OF WATER PROBLEMS

In a world that is confronted with a multitude of problems of various magnitude, the professional who is working with water resource problems of various kinds may assume that everyone recognizes the significance of water problems. Certainly people do verbalize awareness of water problems of various types when asked about such problems. However, when asked what they felt were the five major problems facing the world today only three percent of the respondents in this sample alluded to water as one of three. Further, only two respondents listed a water problem as the problem of first importance.

However, when the respondents were asked if they had ever considered water as a problem, 34% responded in the affirmative. It is to the analysis of what kinds of persons indicate a water problem perception that we now turn our attention.

As Table 13 indicates, 39% of the males in the sample reported a water problem perception while only 29% of the females did so. This differential seems consistent with the expectation that males are more "aware" of problems than are females. There seems to be a clear inverse relationship between age and a water problem perception. Table 14 demonstrates that those respondents under forty-four years of age are significantly more likely to report considering water a problem than are those forty-five and over. Fully 44% of those individuals under twenty-one do so while only 25% of those fifty-five and over verbalize a problem consideration. This finding is consistent with the apparent relationship between age and concern with and awareness of problems in general.

While the majority of respondents in this sample is married, there does not appear to be a relationship between martial status and perception of water as a problem. In fact, as Table 15 indicates, single respondents are more likely to report a consideration of water as a problem than are married respondents. It also seems to be the case that urban or rural residence is not related to perception of water problems. Table 16 shows that while 32% of the rural residents have considered water a problem, 34% of the urban respondents have done so, and this difference is not significant. While rural or urban residence is not related to consideration of water problems, length of residence at present address seems to be. In Table 17 it may be seen that the shorter the length of residence at present address, the greater the tendency to report having considered water a problem. Of the respondents living at their

TABLE 13

SEX OF RESPONDENT RELATED TO HIS HAVING CONSIDERED WATER A PROBLEM
N=453

	HAVE YOU EVER CONSIDERED WATER A PROBLEM			
Sex	Yes	No	NR/DK	Total
Male	87	133	4	224
Female	66	159	4	229
Total	153	292	8	453

TABLE 14

AGE OF RESPONDENT RELATED TO HIS HAVING CONSIDERED WATER A PROBLEM
N=453

	HAVE YOU EVER CONSIDERED WATER A PROBLEM			
Age	Yes	No	NR/DK	Total
Under 21	8	10	0	18
21-35	79	100	3	182
36-44	24	46	1	71
45-54	18	45	3	66
55 +	23	91	1	115
DK/Ref	1	0	0	1
Total	153	292	8	453

TABLE 15

MARITAL STATUS OF RESPONDENT RELATED TO HIS HAVING CONSIDERED WATER A PROBLEM
N=453

Marital Status	HAVE YOU EVER CONSIDERED WATER A PROBLEM			
	Yes	No	DK/Ref	Total
Married	124	228	6	358
Single	20	27	0	47
Widow or Widower	5	6	0	9
Divorced	3	6	0	9
Separated	1	1	0	2
Total	153	292	8	453

TABLE 16

PLACE OF RESIDENCE OF RESPONDENT RELATED TO HIS HAVING CONSIDERED WATER A PROBLEM
N=453

	HAVE YOU EVER CONSIDERED WATER A PROBLEM			
Place of Residence	Yes	No	DK/Ref	Total
Rural	39	80	3	122
Town	113	210	5	328
City	1	2	0	3
Total	153	292	8	453

TABLE 17

LENGTH OF RESIDENCE AT PRESENT ADDRESS RELATED TO RESPONDENTS HAVING CONSIDERED WATER A PROBLEM
N=453

Length of Residence	HAVE YOU EVER CONSIDERED WATER A PROBLEM			
	Yes	No	DK/Ref	Total
Less than one year	47	50	2	99
1-2 years	30	38	2	70
3-4 years	17	39	1	57
5-6 years	11	25	0	36
7-8 years	4	10	0	14
9-10 years	6	12	0	18
11 or more years	32	109	2	143
Entire lifetime	6	9	1	16
DK/Ref	0	0	0	0
Total	153	292	8	453

present addresses less than one year, 47% report consideration of water problems compared to 22% of those living at present addresses eleven or more years. This finding is consistent with the previously reported data that young persons, more than older persons, reported water as a problem. Older persons were more likely to have lived at their present addresses a greater number of years than was characteristic of younger respondents.

The common sense view that the apartment or trailer house dweller has but little interest in various problems is not supported by the findings. A higher per cent of those respondents who live in multiple dwellings (49%) or in trailer houses (36%) have considered water a problem than is the case for those respondents living in single dwellings (30%). This finding is further reinforced by the data reported in Table 19 which indicated that 47% of those respondents who do not own their homes have considered water a problem while only 28% of those who own their homes have done so.

Educational attainment is a factor which has positive significant relationship to considering water as a problem. Table 20 shows that only 11% of those respondents with some grade school, compared to 59% of those with post-graduate school, report having considered water a problem. Education beyond high school seems to be an important factor in recognizing water as a problem. The significance of education holds for the related characteristic of occupation as shown in Table 21. The higher the occupational prestige of the respondent, the more likely he is to report having considered water a problem. Only 17% of the lower blue collar occupational group report such a consideration while 56% of the professional and managerial group do so. Furthermore, the factor most closely related to education and income again shows a significant relationship. The data in Table 22 indicated that the higher the income, the more likely the respondent has considered water a problem. While 41% of these respondents in the $15,000 and over income group report such a consideration, only 22% of those in the under $3,000 group report a like consideration.

While it seems to be the case that only a very small proportion of the respondents in this sample considers water a serious problem (3%), when asked if they had ever had such a perception, fully 34% reported that they had. The type of individual who seems most likely to hold such a view is a young, single male, who may live in a rural or urban surrounding, has lived in his present residence a relatively short time (under six years), lives in an apartment house and does not own his own home, has finished college and perhaps has some post-graduate education, is employed as a professional or manager, and earns in excess of $10,000 per year.

TABLE 18

TYPE OF RESIDENCE RELATED TO RESPONDENTS HAVING CONSIDERED WATER A PROBLEM
N=453

Type of Residence	HAVE YOU EVER CONSIDERED WATER A PROBLEM			
	Yes	No	DK/Ref	Total
Single dwelling	101	233	4	338
Multiple dwelling	39	38	2	79
Trailer house	13	21	2	36
Total	153	292	8	453

TABLE 19

OWNERSHIP OF HOME RELATED TO RESPONDENTS HAVING CONSIDERED WATER A PROBLEM
N=453

Home Ownership	HAVE YOU EVER CONSIDERED WATER A PROBLEM Yes	No	DK/Ref	Total
Owns home	89	222	6	317
Does not own home	64	70	2	136
Total	153	292	8	453

TABLE 20

EDUCATIONAL ATTAINMENT OF RESPONDENT RELATED TO HIS HAVING CONSIDERED WATER A PROBLEM
N=453

Amount of Education	HAVE YOU EVER CONSIDERED WATER A PROBLEM			
	Yes	No	DK/Ref	Total
Some grade school	7	57	0	64
Finished grade school	7	16	1	24
Some high school	16	57	0	73
Finished high school	29	64	4	97
Trade or business school	4	8	0	12
Some college	36	51	1	88
Finished college	31	23	1	55
Post-graduate school	23	15	1	39
DK/ref.	0	1	0	1
Total	153	292	8	453

TABLE 21

OCCUPATION OF RESPONDENT RELATED TO HIS HAVING CONSIDERED WATER A PROBLEM
N=453

	HAVE YOU EVER CONSIDERED WATER A PROBLEM			
Occupation	Yes	No	DK/Ref	Total
Farmer	3	4	0	7
Professional and Managerial	55	41	2	98
White collar	7	32	0	39
Upper blue collar	13	24	0	37
Lower blue collar	12	57	2	71
Housewife	37	99	3	139
Disabled	1	3	0	4
Student	25	27	1	53
Unemployed	0	2	0	2
Retired	0	2	0	2
Total	153	292	8	453

TABLE 22

FAMILY INCOME RELATED TO RESPONDENTS HAVING CONSIDERED WATER A PROBLEM
N=453

	HAVE YOU EVER CONSIDERED WATER A PROBLEM			
Income	Yes	No	DK/Ref	Total
Under 3,000	19	67	2	88
3,000-4,999	19	48	2	69
5,000-7,499	28	55	1	84
7,500-9,999	30	50	0	80
10,000-11,999	23	23	1	47
12,000-14,999	12	17	1	30
15,000 +	14	19	1	34
DK/Ref	8	13	0	21
Total	153	292	8	453

The next important question is to attempt to discover what type of water problem this characterized individual perceives. It is to this question that we now turn our attention.

As indicated in Table 23, the most common water problem verbalized by the respondents was that of water pollution, followed by water shortage. The perception of pollution as a water problem tends to be somewhat diffuse; the problem perception lacks specificity. Representative of the comments concerning water pollution are the following:

"Unclean water because of garbage, detergents and oil"

"The dirty streams"

"Dirtying up the water in the streams with pollution"

"Contamination of water"

"Industrial and city waste dumped into the streams"

Indicating a concern with water shortage, respondents commented:

"Population explosion; we're using too much water."

"The more children we have going to school the more we're going to use."

"I wonder if there's always going to be enough water."

"During a drought our well goes dry."

"I wonder what would become of us if we have a few more dry summers."

Concerning problems of water purification, representative comments are:

"Getting rid of the salt to make ocean water pure enough to use."

"It has to be purified."

"We have to treat our well now; never used to have to do that."

TABLE 23

TYPE AND ORDER OF WATER PROBLEMS LISTED BY RESPONDENTS
N=453

TYPE OF PROBLEM	FIRST PROBLEM	SECOND PROBLEM	THIRD PROBLEM	TOTAL
POLLUTION	85	14	4	103
General Pollution	80	0	2	
Industrial Pollution	3	12	0	
Dirty Streams	0	0	0	
Killing Fish	1	2	2	
Seepage of Pollution	0	0	0	
SHORTAGE	35	17	2	54
Water Table Lowering	5	3	1	
Rural Shortage	1	0	0	
State Shortage	1	0	0	
Local Shortage	7	1	0	
National Shortage	18	11	0	
Conservation	2	1	1	
Flood Control	1	1	0	
WATER PURIFICATION	16	2	2	20
Ground Water	15	2	2	
Salt Water	1	0	0	
MISCELLANEOUS	15	6	1	22
Price Too High	8	3	0	
Lack Indoor Water	2	0	0	
Availability	4	2	0	
Fluoridation	1	0	1	
Irrigation	0	1	0	
WATER NOT A PROBLEM	302	414	442	--

"You have to filter the stuff we get now before you can drink it."

Other respondents indicated various kinds of concerns with water. Representative of these are:

"My bill has gone up."

"It has to be arranged in the home to be convenient."

"The water rates are extremely high."

"Getting it in sufficient quantity in the right area."

Perhaps one respondent succinctly described man's concern over water with the comment, "Well, you have to have a certain amount of it."

It is apparent that water pollution is the major concern of the sample. Table 24, using a slightly different classification of water problems, reveals no patterned relationship between sex of respondent and type of water problem perceived. The finding was not totally expected. It is considered likely that men would be more concerned with water pollution as it affected recreational use of water for fishing, boating and similar activities while women would focus on water pollution as it involved use of water in the home. When age is related to type of water problem (Table 25), again no recognizable differences are apparent. It does appear, however, that married respondents are more concerned about water shortage than are single respondents (Table 26) and that these same persons are significantly more concerned about water purification than their single counterparts.

Table 27 indicates that the urban dweller is only slightly more concerned about water shortage than the rural resident, but he is more concerned about cost of water, as might be expected, and its availability. The respondent who resides in a single dwelling seems more aware of problems of water shortage, purifications, and the cost of water than the apartment dweller who seems to perceive water pollution as the major water problem (Table 28). This relationship holds to some extent in Table 29 where the data indicate that the respondent who owns his home is only slightly more aware of water cost (2% compared to less than 1%) than his renting counterpart. However more of the non-home owners verbalize water problems, 47% to 28%, than do home owners.

TABLE 24

SEX OF RESPONDENT RELATED TO THE FIRST WATER PROBLEM LISTED
N=453

	WHAT KINDS OF PROBLEMS DO YOU THINK ARE ASSOCIATED WITH WATER										
Sex	Pollution	Shortage	Water Waste	Floods	Water Purification	Cost	Convenience of Facility	Availability	Other	Water Not A Problem	Total
Male	54	18	1	0	10	3	0	3	1	137	224
Female	31	15	1	1	6	5	2	1	1	163	226
Total	85	33	2	1	16	8	2	4	2	300	450

TABLE 25

AGE OF RESPONDENT RELATED TO FIRST WATER PROBLEM LISTED
N=453

	WHAT KINDS OF PROBLEMS DO YOU THINK ARE ASSOCIATED WITH WATER										
Age	Pollution	Shortage	Water Waste	Floods	Water Purification	Cost	Convenience of Facility	Avail-ability	Other	Water Not A Problem	Total
Under 21	5	2	0	0	1	0	0	0	0	10	18
21-35	51	11	1	0	8	2	1	2	2	104	182
36-44	15	7	0	0	1	0	0	1	0	47	71
45-54	6	7	0	0	2	3	0	0	0	48	66
55 or over	7	6	1	1	4	3	1	1	0	91	115
DK/ref	1	0	0	0	0	0	0	0	0	0	1
Total	85	33	2	1	16	8	2	4	2	300	453

TABLE 26

MARITAL STATUS OF RESPONDENT RELATED TO FIRST WATER PROBLEM LISTED
N=453

	WHAT KINDS OF PROBLEMS DO YOU THINK ARE ASSOCIATED WITH WATER										
Marital Status	Pollution	Shortage	Water Waste	Floods	Water Purification	Cost	Convenience of Facility	Avail-ability	Other	Water Not A Problem	Total
Married	67	27	1	0	13	7	2	4	2	235	358
Single	14	4	0	0	2	0	0	0	0	27	47
Widow/ Widower	2	1	1	1	0	1	0	0	0	31	37
Divorced	1	1	0	0	1	0	0	0	0	6	9
Separated	1	0	0	0	0	0	0	0	0	1	2
Total	85	33	2	1	16	8	2	4	2	300	453

TABLE 27

RURAL OR URBAN RESIDENCE RELATED TO FIRST WATER PROBLEM LISTED
N=453

	WHAT KINDS OF PROBLEMS DO YOU THINK ARE ASSOCIATED WITH WATER										
Residence	Pollution	Shortage	Water Waste	Floods	Water Purification	Cost	Convenience of Facility	Availability	Other	Water Not A Problem	Total
Rural	21	8	0	1	5	1	2	0	1	83	122
Urban	64	25	2	0	11	7	0	4	1	217	331
Total	85	33	2	1	16	8	2	4	2	300	453

TABLE 28

TYPE OF RESIDENCE RELATED TO FIRST WATER PROBLEM LISTED
N=453

	WHAT KINDS OF PROBLEMS DO YOU THINK ARE ASSOCIATED WITH WATER										
Type of Residence	Pollution	Shortage	Water Waste	Floods	Water Purification	Cost	Convenience of Facility	Availability	Other	Water Not A Problem	Total
Single Dwelling	47	26	1	1	13	7	2	3	1	237	338
Multiple Dwelling	29	4	1	0	2	1	0	1	1	40	79
Trailer	9	3	0	0	1	0	0	0	0	23	36
Total	85	33	2	1	16	8	2	4	2	300	453

TABLE 29

HOME OWNERSHIP RELATED TO FIRST WATER PROBLEM LISTED
N=453

	WHAT KINDS OF PROBLEMS DO YOU THINK ARE ASSOCIATED WITH WATER										
Home Ownership	Pollution	Shortage	Water Waste	Floods	Water Purification	Cost	Convenience of Facility	Availability	Other	Water Not A Problem	Total
Owns Home	41	24	1	1	10	6	2	3	1	228	317
Does Not Own Home	44	9	1	0	6	2	0	1	1	72	136
Total	85	33	2	1	16	8	2	4	2	300	453

When educational attainment is related to types of water problems reported (Table 30), there is a demonstrated relationship between amount of education and verbalization of water problems. For those respondents who have continued their education beyond high school, over half report various water problems. A greater proportion of these respondents report a concern with water pollution while less educated individuals seem to be more concerned over water shortage. This finding is supported by the data in Table 31 which indicates a slight relationship between concern with water pollution and income. As might be expected, those with lower incomes are more concerned with water cost than their more affluent counterparts.

In summary, then, the respondents in this sample do not indicate an awareness of water problems, unless specifically asked to respond to a question about water problems. Only 3% of the sample volunteered water as a major problem facing the world today. However, when asked if they had ever considered water a problem, 34% gave an affirmative response.

Water pollution is the problem of greatest concern to these respondents, followed by water shortage. A further analysis of the data revealed that the individual most likely to consider water a problem is a younger male, who is geographically mobile, has continued his education beyond high school, is employed as a professional or manager, and earns in excess of $10,000 per year. The type of water problem that is of concern to him is most likely to be water pollution, although he tends to be somewhat unspecific about its meaning. In the next section we will attempt to analyze some correlates of a water problem perspective.

TABLE 30

EDUCATIONAL ATTAINMENT RELATED TO FIRST WATER PROBLEM LISTED
N=453

	WHAT KINDS OF PROBLEMS DO YOU THINK ARE ASSOCIATED WITH WATER										
Education	Pollution	Shortage	Water Waste	Floods	Water Purification	Cost	Convenience of Facility	Availability	Other	Water Not A Problem	Total
Some Grade School	2	2	0	0	2	0	0	0	0	58	64
Finished Grade School	4	1	0	1	0	1	0	0	0	17	24
Some High School	7	6	0	0	1	1	1	0	0	57	73
Finished High School	14	9	1	0	3	2	0	0	1	67	97
Trade/Business School	2	1	0	0	1	0	0	0	0	8	12
Some College	22	7	0	0	4	2	0	1	0	52	88
Finished College	19	5	0	0	2	2	1	1	1	24	55
Post-Grad. School	15	2	1	0	3	0	0	2	0	16	39
DK/Ref	0	0	0	0	0	0	0	0	0	1	1
Total	85	33	2	1	16	8	2	4	2	300	453

TABLE 31

FAMILY INCOME RELATED TO FIRST WATER PROBLEM LISTED
N=453

	WHAT KINDS OF PROBLEMS DO YOU THINK ARE ASSOCIATED WITH WATER										
Income	Pollution	Shortage	Water Waste	Floods	Water Purification	Cost	Convenience of Facility	Availability	Other	Water Not A Problem	Total
Under 3,000	12	1	1	1	2	2	1	0	0	68	88
3,000-4,999	6	6	0	0	3	2	1	0	0	51	69
5,000-7,499	17	5	0	0	3	2	0	1	0	56	84
7,500-9,999	20	6	1	0	0	0	0	1	2	50	80
10,000-11,999	14	6	0	0	1	0	0	2	0	24	47
12,000-14,999	8	3	0	0	1	0	0	0	0	18	30
15,000-over	3	5	0	0	5	1	0	0	0	20	34
DK/Ref	5	1	0	0	1	1	0	0	0	13	21
Total	85	33	2	1	16	8	2	4	2	300	453

CORRELATES OF PROBLEM PERCEPTION

An awareness that water does constitute a problem is contingent on experience or communication of a problem viewpoint. A significant part of understanding the sociological factors related to respondent verbalization of a water problem awareness is the attempt to isolate the source of the awareness.

Fully 75% of the respondents in the sample indicated that they had heard or read a discussion of some aspect of water problems. More males (80%) than females (69%) reported that they had heard or read that water was a problem, and a greater proportion of the younger respondents than the older ones had heard or read such information (Tables 32 and 33). Amount of educational attainment is positively related to awareness of water problems ranging from about 50% of respondents who had some grade school to 100% of those who had post graduate school (Table 34). When occupation is related to the respondents having heard or read of water problems, almost 100% of the students had done so and most of the professional and managerial group. However, more of the white collar group reported not having heard or read of water problems than any other occupational group. (Table 35). Amount of family income is also positively related to having heard or read about water problems. The greater the family income, the more likely the respondent is to report having an awareness of water problems (Table 36).

The type of person who is most likely to have heard or read about water problems is a male, under 45 years of age, with college or post graduate educational attainment, employed as a professional manager (or, perhaps an upper blue collar worker), and who has a yearly family income in excess of $10,000. Conversely, the type of person least likely to have heard or read about water problems is a female over 45 years of age with a grade school education, a family income of under $3,000 a year, and either a lower blue collar (or clerical) job or homemaking responsibilities.

Given the characteristics of individuals who report having heard or read that water is a problem, further analysis of the types of communication media available to the respondents seems important. Table 37 reports on the relationship of the availability of television, radio, newspapers, journals, and magazines in the homes of the respondents and their having heard or read that water is a problem.

TABLE 32

SEX OF RESPONDENT RELATED TO AWARENESS THAT WATER IS A PROBLEM
N=453

Sex	HAVE YOU HEARD OR READ THAT WATER IS A PROBLEM?			Total
	Yes	No	DK/Ref.	
Male	180	43	1	224
Female	158	69	2	229
Total	338	112	3	453

TABLE 33

AGE OF RESPONDENT RELATED TO AWARENESS THAT WATER IS A PROBLEM
N-453

Age	HAVE YOU HEARD OR READ THAT WATER IS A PROBLEM?			Total
	Yes	No	DK/Ref.	
Under 21	17	1	0	18
21 - 35	155	25	2	182
36 - 44	54	17	0	71
45 - 54	40	26	0	66
55 - over 55	71	43	1	115
DK/Ref.	1	0	0	1
Total	338	112	3	453

TABLE 34

EDUCATIONAL ATTAINMENT OF RESPONDENT RELATED TO AWARENESS THAT WATER IS A PROBLEM
N=453

Educational Attainment	HAVE YOU HEARD OR READ THAT WATER IS A PROBLEM			Total
	Yes	No	DK/Ref.	
Some grade school	31	33	0	64
Finished grade school	16	8	0	24
Some high school	51	22	0	73
Finished high school	65	30	2	97
Trade/Business school	6	5	1	12
Some college	79	9	0	88
Finished college	51	4	0	55
Post graduate school	39	0	0	39
DK/Ref.	0	1	0	1
Total	338	112	3	453

TABLE 35

OCCUPATION OF RESPONDENT RELATED TO AWARENESS THAT WATER IS A PROBLEM
N=453

Respondent's Occupation	HAVE YOU HEARD OR READ THAT WATER IS A PROBLEM? Yes	No	DK/Ref.	Total
Professional & Managerial	89	9	0	98
White Collar	17	22	0	39
Upper Blue Collar	31	5	1	37
Lower Blue Collar	47	23	1	71
Farm	4	3	0	7
Housewife	93	45	1	139
Student	52	1	0	53
Unemployed	2	0	0	2
Retired	1	1	0	2
Disabled	1	3	0	4
Total	338	112	3	453

TABLE 36

INCOME LEVEL RELATED TO AWARENESS THAT
WATER IS A PROBLEM
N=453

Family Income (dollars)	HAVE YOU HEARD OR READ THAT WATER IS A PROBLEM? Yes	No	DK/Ref.	Total
Under 3,000	56	31	1	88
3,000 - 4,999	46	23	0	69
5,000 - 7,499	58	26	0	84
7,500 - 9,999	65	15	0	80
10,000 - 11,999	41	4	2	47
12,000 - 14,999	26	4	0	30
15,000 - over	31	3	0	34
DK/Ref.	15	6	0	21
Total	338	112	3	453

TABLE 37

TYPE OF COMMUNICATION MEDIA IN HOME RELATED TO RESPONDENT'S HAVING HEARD THAT WATER IS A PROBLEM
N=453

Type of Communication Media In Home	HAVE YOU HEARD OR READ THAT WATER IS A PROBLEM? Yes	No	DK/Ref.	Total
Respondent has T.V.	325	107	2	434
Respondent has no T.V.	13	5	1	19
Respondent has radio	326	104	3	433
Respondent does not have a radio	12	8	0	20
Respondent has daily newspaper	267	74	1	342
Respondent does not have daily newspaper	71	38	2	111
Respondent has weekly newspaper	178	42	3	223
Respondent does not have weekly newspaper	160	70	0	230
Respondent has professional journal	84	5	0	89
Respondent does not have professional journal	254	107	3	364
Magazine:				
Movie and romance only	0	0	1	1
Picture type only	26	8	1	35
News and report only	17	1	0	18
Sports and hobby only	1	0	0	1
Business only	11	0	0	11
General literature	27	14	0	41
Mixture of types <u>except news</u>	115	29	0	114
Mixture of types <u>including news</u>	83	10	0	93
Does not apply (no magazines)	58	50	1	109

In general, there appears to be no clear cut relationship between types of communication media in the home and awareness of water problems. However, it does seem to be the case that if the respondent does have a communication media in the home, of almost any type, he is more likely to have heard or read about water problems than if such media is not available in the home. It can not be concluded, however, that any particular type of media, with the possible exception of the professional journal,[21] is more efficacious in the communication of water problems than any other type.

As shown in Table 38, more respondents report television as being their source of information on water problems than any other single media. Television is also the media that is available in all but seventeen of the sample's homes, which makes it the most available type of communications media in the sample. Next in rank as the reported source of water problem information is reading about water problems in an unspecified source. (This category includes more than one reading source, esp. newspaper and magazine). Newspapers and magazines also are often reported by the respondents as sources of information about water problems.

Table 38 does not, however, clearly indicate a relationship between type of media in the home and reported source of problem information. It is evident that most of the homes in the sample have a variety of communications media available. Of these media, television seems to be a common source of water problem information.

The most common water problem reported was water pollution. As Table 39 indicates, water pollution was followed by water shortage, water purification, floods, water availability and water waste. It remains difficult to sort out the relationship between a particular type of communication media in the home and type of water problem presented to the listener or reader. Again, it is clear that television is an important communicator of water problems, but it remains doubtful that there is a relationship between television and kind of water problem presented. It appears that all forms of media may report more on problems of water pollution than any other type of water problem.

In this section an analysis has been made of the correlates of a water problem perception by the respondent. The characteristics of the respondent who tends to be aware of water problems tend to suggest that he is a younger male with advanced educational attainment, working as a professional or semi-professional, with relatively high income, who has various types of

TABLE 38

AVAILABILITY OF TYPES OF COMMUNICATION MEDIA IN THE HOME RELATED TO SOURCE OF INFORMATION ON WATER PROBLEMS AS INDICATED BY RESPONDENT
N=453*

Type of Media In the Home	SOURCE OF INFORMATION AS REPORTED BY THE RESPONDENT								
	Radio	Television	Newspaper	Magazine	Clubs	Friends & Associates	Reading Not Specified	Hearing Not Specified	Never Heard of Water Problems
Radio	5	100	40	28	2	28	71	41	118
No Radio	1	5	0	2	0	1	2	0	8
Television	5	103	39	29	2	28	69	38	121
No Television	0	2	1	1	0	1	4	3	5
Daily Newspaper	3	72	32	26	2	22	67	32	86
No Daily Newspaper	3	33	8	4	0	7	6	9	41
Weekly Newspaper	2	50	22	21	1	13	42	22	50
No Weekly Newspaper	4	55	18	9	1	16	31	19	77
Magazines	4	78	27	28	2	23	71	36	75
No Magazines	2	27	13	2	0	6	2	5	52
Professional Journal	0	18	6	12	1	4	22	17	9
No Professional Journal	5	87	34	18	1	25	51	24	118

*Don't know and refused omitted from this table

TABLE 39

TYPE OF COMMUNICATIONS MEDIA AVAILABLE IN THE HOME RELATED TO THE KIND OF WATER PROBLEM DISCUSSED AS REPORTED BY RESPONDENT
N=453*

Type of Media in Home	NATURE OF THE WATER PROBLEM DISCUSSED AS REPORTED BY RESPONDENT						
	Pollution	Shortage	Water Waste	Floods	Water Purification	Water Availability	Other
Radio	227	79	5	6	8	6	6
No Radio	6	3	0	1	1	0	1
Television	223	70	4	7	9	5	7
No Television	10	2	0	0	0	1	0
Daily Newspaper	187	55	3	5	8	6	3
No Daily Newspaper	46	17	2	2	1	0	4
Weekly Newspaper	124	37	3	4	4	4	4
No Weekly Newspaper	109	35	2	3	5	6	3
Magazine	196	59	4	4	8	6	4
No Magazine	37	13	1	3	1	0	3
Professional Journal	68	10	1	1	2	3	0
No Professional Journal	165	62	3	6	7	3	7

*Don't know, refused, and never considered water a problem excluded from this table

communication media available in his home, and who reports that the type of water problem he is most aware of is the problem of water pollution.

PUBLIC VIEW OF WHAT ACTION SHOULD BE TAKEN TO SOLVE WATER PROBLEMS

American society has been characterized as having a value orientation of "mastery over nature," and this characterization is supported in that only 3% of this sample felt that water problems could not be solved. As Table 40 indicates, however, 41% of the respondents were unsure of the nature of the solution to water problems. It is difficult to interpret this uncertainty because it may reflect only the respondent's feeling that he lacks knowledge related to a solution and not disbelief that a solution is possible, or it may mean that the respondent is unsure that a solution is possible, i.e., it's beyond man's ability to solve the problems of water resources. The majority of respondents, 56%, do feel that water resource problems can be solved.

As Table 41 shows, more males than females feel water problems are amiable to solution. Further, more females than males feel that there is no solution to water problems, although this difference is not significant, and are more likely to be uncertain than are the sampled males. The younger the respondent is, as shown in Table 42, the more likely he is to feel that a solution to water resource problems is possible. The older he is, the more uncertain he tends to be or feels that a solution is not possible (although the latter is not a significant relationship). There is no apparent significant relationship between martial status and a belief that water problems can or can not be solved, as Table 43 demonstrates.

A slightly higher proportion of rural residents are uncertain of the solution to water problems than are urban residents (Table 44), and the home owner seems slightly more uncertain than his non-owner counterpart, as shown in Table 45.

There exists a significant positive relationship between educational attainment and belief that water resource problems can be solved. As Table 46 demonstrates, those who have continued their education beyond h igh school are much more likely to express belief that such problems can be solved than are those with an educational attainment level of high school or less. The related factor of occupation supports the educational finding but indicates that the greater the prestige of the occupation category, the more likely is the reported belief in a solution to water problems (Table 47). The same general relationship holds for income, as shown in Table 48. The greater the amount of yearly income, the greater is a reported acceptance of some solution to water resource problems, even when considering the uncertainty

TABLE 40

PUBLIC PERCEPTION OF THE POSSIBILITY OF SOLVING WATER PROBLEMS
N=453

Do you think Water Problems can be solved?	Number	Percent
Yes	254	56%
No	15	3%
Uncertain	184	41%
Total	453	100%

*Uncertain includes a"Don't Know" response.

TABLE 41

SEX OF RESPONDENT RELATED TO HIS PERCEPTION OF THE POSSIBILITY OF SOLVING WATER PROBLEMS
N=453

Sex	Do you think Water Problems can be solved?			
	Yes	No	Uncertain	Total
Male	153	6	65	224
Female	100	9	120	229
Total	253	15	185	453

TABLE 42

AGE OF RESPONDENT RELATED TO HIS PERCEPTION OF THE POSSIBILITY OF SOLVING WATER PROBLEMS
N=453

Age of Respondent	Do you think Water Problems can be solved? Yes	No	Uncertain	Total
Under 21	16	1	1	18
21 - 35	119	4	58	181
36 - 44	41	3	27	71
45 - 54	31	1	34	66
55+	46	6	64	116
DK/ref.	0	0	1	1
Total	253	15	185	453

TABLE 43

MARITAL STATUS OF RESPONDENT RELATED TO HIS PERCEPTION OF THE POSSIBILITY OF SOLVING WATER PROBLEMS
N=453

	Do you think Water Problems can be solved?			
Marital Status	Yes	No	Uncertain	Total
Married	205	8	145	358
Single	32	5	10	47
Widow or widower	11	2	24	37
Divorced	4	0	5	9
Separated	1	0	1	2
Total	253	15	185	453

TABLE 44

RURAL OR URBAN RESIDENCE RELATED TO RESPONDENT'S PERCEPTION OF THE POSSIBILITY OF SOLVING WATER PROBLEMS
N=453

	Do you think Water Problems can be solved?			
Residence	Yes	No	Uncertain	Total
Rural	58	6	58	122
Urban	195	9	127	331
Total	253	15	185	453

TABLE 45

HOME OWNERSHIP RELATED TO RESPONDENT'S PERCEPTION OF THE POSSIBILITY OF SOLVING WATER PROBLEMS
N=453

	Do you think Water Problems can be solved?			
Home Ownership	Yes	No	Uncertain	Total
Home Owner	159	11	147	317
Non-Home Owner	94	4	38	136
Total	253	15	185	453

TABLE 46

EDUCATIONAL ATTAINMENT OF RESPONDENT RELATED TO HIS PERCEPTION OF THE POSSIBILITY OF SOLVING WATER PROBLEMS
N=453

Educational Attainment	Do you think Water Problems can be solved? Yes	No	Uncertain	Total
Some Grade School	20	4	40	64
Finished Grade School	11	0	13	24
Some High School	31	4	38	73
Finished High School	41	2	54	97
Trade or Business School	5	1	6	12
Some College	63	4	21	88
Finished College	45	0	10	55
Post Graduate School	37	0	2	39
DK/ref.	0	0	1	1
Total	253	15	185	453

TABLE 47

OCCUPATION OF RESPONDENT RELATED TO HIS PERCEPTION OF THE POSSIBILITY OF SOLVING WATER PROBLEMS
N=453

Occupation	Do you think Water Problems can be solved? Yes	No	Uncertain	Total
Professional Managerial	82	1	15	98
White Collar	15	1	24	40
Upper Blue Collar	20	0	17	37
Lower Blue Collar	29	4	37	70
Farm	2	0	6	8
Housewife	58	4	77	139
Student	45	4	4	53
Unemployed	0	0	2	2
Retired	1	1	0	2
Disabled	1	0	3	4
Total	253	15	185	453

TABLE 48

FAMILY INCOME OF RESPONDENT RELATED TO HIS PERCEPTION OF THE POSSIBILITY OF SOLVING WATER PROBLEMS
N=453

Income (In Dollars)	Do you think Water Problems can be solved? Yes	No	Uncertain	Total
Under 3,000	41	4	43	88
3,000 - 4,999	29	4	36	69
5,000 - 7,499	44	1	39	84
7,500 - 9,999	50	3	27	80
10,000 - 11,999	31	1	15	47
12,000 - 14,999	22	0	8	30
15,000 +	24	1	9	34
DK/ref.	12	1	8	21
Total	253	15	185	453

response. While it would be meaningless to analyze in great detail the fifteen respondents who felt that water problems can not be solved, Table 49 reports on the reasons why they reported such a belief. The importance of industrial self-interest groups was cited by five of the respondents, while three felt the problem was beyond man's control or that the problem was too massive for man to solve. Two others felt that there was little commitment to a problem solution, while one felt a solution was not economically feasible, and another cited "no rain" as the major reason.

Table 50 demonstrates that the female tends to feel that self-interest groups prevent solution of water resource problems, while the males feel the problem is too massive or simply that man has no control over it. The urban resident, as shown in Table 51, is more likely to feel that man himself prevents solution of water problems (self-interest groups), while the rural resident tends to feel it is a supernatural problem out of the realm of man's intervention.

Representative of the comments from respondents who don't feel a solution to water resource problems is feasible are:

"If we don't have rain, I don't know what we can do about it."

"This is a capitalist country where the almighty dollar is everything."

"I don't know. It would take more brains than I have."

"Industrial control would help, but industrialists would take more profits than try to do something on their own to correct the situation."

Whatever reasons the above fifteen respondents gave for the belief that water problems are beyond man's ability to solve, the majority of respondents did feel that a solution to water resource problems is possible. As Table 52 indicates, many of these respondents thought that one solution would be to enact more effective legislation to cope with water problems. Second in rank order was the general feeling that there must be an end to water pollution. Research was viewed as another way to cope with water resource problems by 7% of the respondents, while 6% felt that it would be necessary to desalt ocean water for man's use. The remainder of the respondents suggested various methods ranging from education of the public to improvement of flood control and water sheds.

It is evident from the data presented in Table 53 that males are more prone to have suggestions for the solution of water resource problems than

TABLE 49

RESPONDENTS' REASONS FOR FEELING THAT WATER PROBLEMS CAN NOT BE SOLVED
N=15

Why can't these problems be solved?	Number
Industry has too much control	5
Man has no control	3
Too Massive a problem	3
People only talk about problems, never take any action	2
No rain	1
Problems can't be economically solved	1
Total	15

TABLE 50

SEX OF RESPONDENT RELATED TO A PERCEPTION THAT WATER PROBLEMS CAN NOT BE SOLVED
N=15

	Why can't Water Problems be solved?						
Sex of Respondent	Self Interest Groups	No Rain	Too Great a Problem	Man Has No Control	Cost Prohibitive	Lack of Commitment	Total
Male	1	0	2	2	0	1	6
Female	4	1	1	1	1	1	9
Total	5	1	3	3	1	2	15

TABLE 51

RURAL OR URBAN RESIDENCE RELATED TO A PERCEPTION THAT WATER PROBLEMS CAN NOT BE SOLVED
N=15

	Why can't Water Problems be solved?						
Rural or Urban Residence	Self Interest Groups	No Rain	Too Great a Problem	Man Has No Control	Cost Prohibitive	Lack of Commitment	Total
Rural	0	1	1	3	1	0	6
Urban	5	0	2	0	0	2	9
Total	5	1	3	3	1	2	15

TABLE 52

RESPONDENTS VIEWS OF WHAT ACTION SHOULD BE TAKEN TO SOLVE WATER PROBLEMS
N=453

WHAT DO YOU THINK SHOULD BE DONE TO CORRECT WATER PROBLEMS?	Number	Percent
Enact Effective Legislation	62	14%
End Pollution	48	11%
Research New Methods to Solve Problems	31	7%
De-salt Ocean Water	27	6%
Improve Filteration Systems	14	3%
Education of the Public	14	3%
Improve Conservation	9	2%
Improve Storage Systems	8	2%
Improve Water Transportation Systems	7	1%
Use of Private Means (wells, etc.)	7	1%
Improve Sewage Systems	3	1%
Improve Flood Control	1	--
Improve Watersheds	1	--
DK/Ref. or Does Not Apply	221	49%
Total	453	100%

TABLE 53

RESPONDENTS VIEW OF WHAT SHOULD BE DONE TO CORRECT THE WATER SITUATION RELATED TO HIS SEX
N=453

WHAT DO YOU THINK SHOULD BE DONE TO CORRECT THE WATER SITUATION?	Male	Female	Total
Legislation	45	16	61
End Pollution	31	16	47
De-salt Ocean Water	18	9	27
Conservation	3	5	8
Improve Filteration System	9	5	14
Improve Storage Systems (reservoirs,etc.)	4	4	8
Improve Watersheds	1	0	1
Develop system of transporting water to areas lacking it	3	4	7
Improve sewage system	2	1	3
Research New Methods to Solve Problems	16	15	31
Private Means	2	4	6
Education	9	5	14
Flood Control	0	1	1
DK/Ref.	81	144	225
Total	224	229	453

are females. Males also tend to feel that legislation, stopping pollution, desaltation of ocean water, and education are solutions to water problems to a greater extent than females, although these are also common solutions suggested by females.

No pattern of relationship between age and the type of solution offered for water problems emerges from consideration of Table 54. There is a tendency for the majority of respondents under twenty-one to offer a solution, which does not hold for the other age groups, and for those in the twenty-one to thirty-five age group to suggest education much more than is the case for the other groups. However, as shown in Table 55, the urban resident is more likely to suggest research as a possible solution than is the rural resident, as is the case for suggesting the use of ocean water. In Table 56 it may be seen that those with higher educational attainment are more prone to suggest the enactment of effective legislation than is the case for those respondents with less educational attainment, and the same relationship holds for the suggestion of making ocean water usable.

Responses which are representative of the individual's suggestions for action to correct water problems are:

"Make public aware of the problem."

"I think you're going to have to have standards from the federal government for the factories to follow to stop pollution."

"Distill sea water for human consumption."

"Enforce laws that already exist or make new ones to prevent dumping."

"People should be more careful with waste that they put in the streams. They put insecticides in that kill the marine life."

"Take the waste and put it through a purifying plant."

"The farmers should work with the townspeople, but they don't want to pay for the wells and won't cooperate."

"Government and industrial sewage disposal should be controlled."

TABLE 54

RESPONDENTS VIEW OF WHAT SHOULD BE DONE TO CORRECT THE WATER SITUATION RELATED TO HIS AGE
N=453

WHAT DO YOU THINK SHOULD BE DONE TO CORRECT THE WATER SITUATION?	Under 21 yrs.	21-35 yrs.	36-44 yrs.	45-54 yrs.	55-over	DK/Ref.	Total
Legislation	4	37	12	5	3	0	61
End Pollution	7	18	7	4	11	0	47
De-salt Ocean Water	0	12	5	5	5	0	27
Conservation	2	2	0	2	2	0	8
Improve Filteration System	0	8	3	1	2	0	14
Improve Storage Systems (reservoirs, etc.)	1	3	1	0	3	0	8
Improve Watersheds	0	1	0	0	0	0	1
Develop system of transporting water to areas lacking it	0	1	1	2	3	0	7
Improve sewage system	0	2	0	1	0	0	3
Research new methods to solve problems	2	16	7	3	3	0	31
Private means	0	1	1	0	4	0	6
Education	0	12	0	1	1	0	14
Flood Control	0	0	0	0	1	0	1
DK/Ref.	2	69	34	42	77	1	225
Total	18	182	71	65	115	1	453

TABLE 55

RESPONDENTS VIEW OF **WHAT** SHOULD BE DONE TO CORRECT THE WATER SITUATION RELATED TO RURAL OR URBAN RESIDENCE
N=453

WHAT DO YOU THINK SHOULD BE DONE TO CORRECT THE WATER SITUATION	Rural	Urban	Total
Legislation	13	48	61
End Pollution	12	35	47
De-salt Ocean Water	4	23	27
Conservation	2	6	8
Improve Filteration Systems	3	11	14
Improve Storage Systems (reservoirs,etc.)	2	6	8
Improve Watersheds	1	0	1
Develop system of transporting water to areas lacking it	4	3	7
Improve sewage systems	0	3	3
Research new methods to solve problems	5	26	31
Private Means	2	4	6
Education	4	10	14
Flood Control	0	1	1
DK/Ref.	70	155	225
Total	122	331	453

TABLE 56

RESPONDENTS' VIEW OF WHAT SHOULD BE DONE TO CORRECT THE WATER SITUATION
RELATED TO AMOUNT OF EDUCATIONAL ATTAINMENT
N=453

What Do You Think should be done to Correct the Water Situation	Some Grade School	Finished Grade School	Some High School	Finished High School	Trade or Business School	Some College	Finished College	Post Graduate School	DK/Ref	Total
Legislation	1	2	3	9	1	21	14	10	0	61
End Pollution	6	1	13	10	1	5	6	5	0	47
Desalt Ocean Water	1	1	0	6	0	8	3	8	0	27
Conservation	1	0	1	1	0	3	2	0	0	8
Improve Filtration System	1	1	2	1	0	5	1	3	0	14
Improve Storage Systems (Reservoirs, etc.)	0	1	0	2	0	2	3	0	0	8
Improve Water Sheds	0	0	0	1	0	0	0	0	0	1
Develop System of Transporting Water to Areas Lacking it	3	0	1	0	0	2	1	0	0	7
Improve Sewage System	0	0	0	1	0	0	1	1	0	3
Investigate & Research New Methods to Solve Problems	1	2	3	2	2	10	6	5	0	31
Private Means	1	0	2	1	0	1	1	0	0	6
Education	1	0	1	1	0	4	4	3	0	14
Flood Control	0	0	0	1	0	0	0	0	0	1
DK/Ref	48	16	47	61	8	27	13	4	1	225
Total	64	24	73	97	12	88	55	39	1	453

"Have state laws that require cities to stop dumping sewage in the streams."

"Eventually they will have to have a commission study it and try to come up with a solution."

Given the fact that the majority of the respondents do feel that a solution to water resource problems can be found, it seems worthwhile to explore who they feel is responsible for action aimed at such a solution. As revealed in Table 57, 26% of the respondents select federal agencies as first, second, or third choice as being responsible for undertaking solutions to water problems. However, 21% of the respondents selected private citizens as their first choice of responsibility, while 16% select federal agencies. It is of interest to note that Business and Industry rank last in terms of perceived responsibility.

As seen in Table 58, males tend to place responsibility on federal agencies and state agencies more than females, while females suggest local agencies more than males. The thirty-six to forty-four age group stress federal agencies over private citizens and are the only age group to do so (Table 59). No demonstrated pattern of difference emerges when viewed responsibility is analyzed in terms of rural-urban differences, as shown in Table 60, nor in terms of education, as Table 61 illustrates. Little difference is apparent when occupational groups are related to views on who is responsible to take action to solve water problems, although the lower blue collar group is about evenly divided on giving federal agencies and private citizens major responsibility.

Thus, when asked who must take major responsibility for action programs designed to solve water problems, the general opinion expressed by the respondents stressed the responsibility of federal agencies and private citizens. It is of some interest to recognize that no respondent mentioned the professional water engineer, although it may be recognized by the respondents that he can bring his knowledge to bear on water problems at the request of some agency or public.

TABLE 57

RESPONDENTS' VIEWS OF WHO IS RESPONSIBLE TO SEE THAT WATER PROBLEMS ARE SOLVED
N=453

Who is Responsible to See that the Situation is Corrected?	First Response #	First Response %	Second Response #	Second Response %	Third Response #	Third Response %	Total #	Total %
Federal Agencies	73	16	30	7	15	3	118	26
Private Citizens	93	21	10	2	1	_**	104	23
State Agencies	39	9	36	8	4	1	79	17
Local Agencies	36	8	8	2	10	2	54	12
Business or Industry	16	3	5	1	2	_**	23	5
DK/Ref or Does Not Apply	196	43	364	80	421	93	__	__
Total	453	100	453	100	453	99	453	__

* Figured on an N=453; includes multiple answers of individual respondents
** Less than 1%

TABLE 58

RESPONDENTS FIRST CHOICE OF WHO IS RESPONSIBLE TO SEE THAT WATER PROBLEMS ARE SOLVED RELATED TO SEX
N=453

WHO SHOULD CORRECT SITUATION?	Male	Female	Total
Local Agents	13	19	32
State Agents	28	10	38
Federal Agents	48	25	73
Business or Industry	8	8	16
Private Citizen	55	38	93
Other State in Which Problem Exists	1	0	1
Other Local-County	2	2	4
DK/Ref.	69	127	196
Total	224	229	453

TABLE 59

RESPONDENTS FIRST CHOICE OF WHO IS RESPONSIBLE TO SEE THAT
WATER PROBLEMS ARE SOLVED **RELATED TO AGE**
N=453

WHO SHOULD CORRECT SITUATION?	Under 21 yrs.	21-35 yrs.	36-44 yrs.	45-54 yrs.	55-over	DK/Ref.	Total
Local Agents	1	11	6	5	9	0	32
State Agents	1	24	2	5	6	0	38
Federal Agents	5	34	16	7	11	0	73
Business or Industry	2	8	4	2	0	0	16
Private Citizens	7	42	13	11	20	0	93
Other State in Which Problem Exists	0	1	0	0	0	0	1
Other Local-County	0	2	1	0	1	0	4
DK/Ref.	2	60	29	36	68	1	196
Total	18	182	71	66	115	1	453

TABLE 60

RESPONDENTS FIRST CHOICE OF WHO IS RESPONSIBLE TO SEE THAT WATER PROBLEMS ARE SOLVED RELATED TO RURAL OR URBAN RESIDENCE
N=453

WHO SHOULD CORRECT SITUATION?	Rural	Urban	Total
Local Agents	10	22	32
State Agents	10	28	38
Federal Agents	16	57	73
Business or Industry	3	13	16
Private Citizens	20	73	93
Other State in Which Problem Exists	0	1	1
Other Local-County	0	4	4
DK/Ref.	63	133	196
TOTAL			453

TABLE 61

RESPONDENTS' FIRST CHOICE OF WHO IS RESPONSIBLE TO SEE THAT WATER PROBLEMS ARE SOLVED RELATED TO EDUCATIONAL ATTAINMENT
N=453

Who Should Correct Situation	Some Grade School	Finished Grade School	Some High School	Finished High School	Trade or Business School	Some College	Finished College	Post Graduate School	DK/Ref	Total
Local Agents	4	3	5	3	0	7	5	5	0	32
State Agents	0	1	4	8	2	10	11	2	0	38
Federal Agents	4	3	7	15	1	19	11	13	0	73
Business or Industry	0	0	4	1	1	3	4	3	0	16
Private Citizens	11	3	12	12	2	27	13	13	0	93
Others - State in Which Problem Exists	0	0	0	0	0	1	0	0	0	1
Other - Local-County	0	0	1	3	0	0	0	0	0	4
DK/Ref	45	14	40	55	6	21	11	3	1	196
Total	64	24	73	97	12	88	55	39	1	453

TABLE 62

RESPONDENTS' FIRST CHOICE OF WHO IS RESPONSIBLE TO SEE THAT WATER PROBLEMS ARE SOLVED RELATED TO OCCUPATION
N=453

Occupation	Local Agent	State Agent	Federal Agent	Business & Industry	Private Citizens	Other-State in which Problem Exists	Other-Local County	DK/Ref	Total
Professional-Managerial	12	14	22	9	25	0	0	16	98
White Collar	0	1	3	0	8	0	1	26	40
Upper Blue Collar	0	4	5	0	10	0	1	17	37
Lower Blue Collar	4	3	11	0	12	0	0	41	70
Farm	0	1	0	0	0	0	0	7	8
Housewife	13	7	14	4	20	0	2	79	139
Student	3	7	17	3	18	1	0	4	53
Unemployed	0	0	0	0	0	0	0	2	2
Retired	0	0	1	0	0	0	0	1	2
Disabled	0	1	0	0	0	0	0	3	4
Total	32	38	73	16	93	1	4	196	453

SUMMARY AND FUTURE RESEARCH

Summary and Conclusions

Increasingly, research attention has been directed toward the quantity and quality of water resources as these significantly relate to the well-being of man in society. The majority of these research efforts has been of a technical nature, with research into the social aspects of water resources neglected.

As an initial effort to gain insight into the relationship between the perception of water problems by the public and attempts of the water expert to deal effectively with water problems, this pilot study has delt with the research question: What are the social factors related to the public's perception of water resource problems?

A sample was drawn from the telephone directories of Montgomery County, Virginia, including the city of Radford and the towns of Blacksburg, Christiansburg, and Shawsville. This sample provided a cross-section of respondents with a wide range of occupational and educational backgrounds. The selection of respondents resulted in a sample size of 453.

The respondents were interviewed over the telephone, by a trained, professional interviewer who used a fixed interview schedule. The interview schedule was constructed to gather data on the social characteristics of the respondents and their perceptions of water problems, the source of these perceptions, and the respondents' feelings about what should be done to solve the perceived problems and who is responsible to undertake such action.

The major findings related to the public's perception of water problems were:

1. Three per cent of the respondents volunteered a perception of water as a major problem facing the world today.

2. Thirty-four per cent of the respondents indicated that they had considered water resources a problem.

3. More males than females perceived water resources to be a problem.

4. Those respondents under forty-four years of age, who have lived at their present address a relatively short time, reside in a multiple dwelling, have continued their education beyond high school, are employed in professional or managerial occupation, and have an income in excess of $10,000 per year, tend to report a water resource problem perception more often than other respondents having other social characteristics.

5. The most common water resource problem verbalized by respondents was pollution, followed by water shortage.

The major findings related to various correlates of a water resource problem perception were:

1. Seventy-five per cent of the respondents reported that they had heard or read a discussion of some aspect of water resource problems.

2. More males than females indicated that they had heard or read a discussion of some aspect of water resource problems.

3. More of the younger respondents, who had continued their education beyond high school and had a yearly income in excess of $10,000 per year, verbalized having heard or read a discussion of some aspect of water resource problems to a greater extent that respondents having other social characteristics.

4. Television was reported as the source of information on water resource problems more often than any other single communications media.

5. The most common water resource problems reported by the respondents as being discussed were water problems related to pollution.

The major findings related to the public's view of what should be done to solve water problems were:

1. Only three per cent of the respondents felt, for one reason or another, that water resource problems could not be solved.

2. Forty-one per cent of the respondents declined to suggest a solution to water resource problems.

3. The majority of respondents who offered a solution to water resource problems felt that there was a need to enact more effective legislation.

4. The majority of respondents felt that the private citizen and appropriate federal agencies were primarily responsible for initiating action to cope with water resource problems.

The above findings constitute only the major findings of possible general interest and must be understood as resulting from a somewhat limited pilot study.

Selected Problems for Future Research

The immediate research problems which seem to be suggested by this limited pilot study include: to what extent will the findings of this study hold in an expanded universe? To what extent do cultural values concerning man's orientation to nature relate to his perception of water resource problems and how does this value orientation differ within a society? On what basis are interest groups formed around water resource problems and how do they influence society's ability to cope with water resource problems? Does the differential perception of water resource problems relate to differential use of water by segments of society? What are the sociological factors related to public acceptance or rejection of recycled water systems? What are the social factors related to the public's perception of water resource problems as involving aspects of water pollution? What influence does the water professional have on the perception of water resource problems and the development implementation of programs to cope with such problems and to what extent and why is he limited in that regard?

There are no doubt countless other research problems that could be formulated from the tentative conclusions of this study. Perhaps that is the basis on which the value of this study might best be evaluated.

RECOMMENDATIONS FOR THE PROFESSIONAL

In a sense, it is always the case that knowledge is inadequate for the magnitude of problems in need of solution. It is assumed here that the nature of a particular water resource problem has been defined, that the engineering technology is available to permit a technical solution of the problem, and that the water expert has been asked by the relevant agency to participate in a program plan to deal with the problem. Given the above situation, the initial task that often must be accomplished is to muster public support for the program which, it is hoped, will permit solution of the problem. For water resource problems, as is the case for many problems involving man's relationship with his natural environment, usually involve the expenditure of public funds.

The recommendations that follow here are formulated on the basis of the findings of this study. Thus, it should be remembered that a pilot study of limited scope, such as this one, has meaningful limitations particularly with regard to the extent to which one can generalize findings. These recommendations should be viewed as "educated suggestions," then, rather than hard and fast principles of action.

A. The public tends to perceive itself as responsible for initiating programs to manage water problems; therefore, every effort should be made to maximally involve a representative public sector in program planning.

This recommendation does not mean that the public necessarily become involved in the actual planning but rather that an effort be made to inform the public, during the planning process, of the nature of the problem and the alternative plans for dealing with the problem. It is important that the public have a feeling of participation, as the program develops, in various decisions which must be made. The professional is likely to experience much less resistance to his program if such a feeling of participation is held by the general public, and because the feeling of public responsibility is apparently already present, the professional can utilize it as he attempts to solve the problem.

B. The public is most aware of problems of water pollution; therefore, aspects of water pollution should be emphasized in developing public awareness of the need for water resource programs.

One of the dimensions of the public acceptance of action programs designed to solve water resource problems is awareness that a problem exists. The data of this study indicate that, for whatever reason, the public is most aware of water pollution problems, and it is this awareness that can be utilized by the professional as he attempts to gather public support for his program. A related consideration here is that water pollution projects a threat to community well-being that also tends to increase public desire for corrective action.

C. Television may be the single most effective communications media for the professional to utilize in developing support for water resource programs.

The data of this study suggest that television is the media most commonly available in the majority of homes. Thus, an appeal for an action program will probably reach a general cross-section of the public through television to an extent not possible through the use of other media.

D. In general, the middle and upper class are the most aware of water resource problems and of the need for corrective action. Educational efforts, therefore, should be directed primarily toward the lower middle and lower classes.

This general recommendation does not mean that support can be assumed from the middle and upper classes but only that in a program which demands broad based public endorsement, special efforts should be made to develop support among the lower middle and lower class public. In general, such efforts should attempt to demonstrate a "pay-off" for the "average" man who, the data of this study suggests, is aware of various interest groups and the role they play in water resource problems.

E. Research methods of the type utilized in this study can be used in other areas to effectively and economically collect information on public reaction and opinion related to water resource problems.

In the opinion of the investigators, the methods used in this study have proven effective given the limitations inherent in the study design. It is to be stressed, however, that: a) a professional telephone interviewer be employed to conduct the telephone interview and that, b) a professional social scientist be employed to design the interview schedule.

FOOTNOTES

1. See, for example, George A. Nikolaieff (Ed.), The Water Crisis, (New York: The H. W. Wilson Company, 1967).

2. "The U.S. Public Considers Its Environment," A National Opinion Trends Report (New Jersey: The Gallup Organization, Inc., February 1969).

3. B. Delworth Gardner and Seth H. Schick, "Factors Affecting Consumption of Urban Household Water in Northern Utah," Bulletin 449, Agricultural Experiment Station, Utah State University, Logan, Utah, November, 1964.

4. Irving A. Spaulding, "Household Water Use and Social Status," Bulletin 392, Agricultural Experiment Station, University of Rhode Island, 1967.

5. Robert A. Shanley, "Community Leader Attitudes on Water Pollution Abatement in Selected Massachusetts Communities on the Connecticut River," Publication No. 4, Water Resources Research Center, University of Massachusetts, Amherst.

6. Alfred W. Booth and Don Voeller, "Meteorological Drought and Its Social Impact in Illinois," Research Report No. 9, Water Resources Center, University of Illinois, March, 1967.

7. Kenneth P. Wilkinson and Lucy W. Cole, "Sociological Factors in Watershed Development," Water Resources Research Institute, Mississippi State University, July, 1967.

8. See, for example, R. Frank Gregg, "Regional Water Resources Research Needs," paper prepared for the Third Annual Conference on Water Resources Research, Washington, D. C., January 30-31, 1968. "Proceedings of Workshop for Sociological Aspects of Water Resources Research," Report No. 1, Social Science Institute Series, Utah State University, Logan, Utah, April 18-19, 1968. "The Social and Economic Aspects of Water Resource Quality Control," Proceedings of the Eleventh Pacific Northwest Symposium on Water Pollution Research, U.S. Department of Health, Education, and Welfare, November 8-9, 1962, Portland, Oregon.

9. While Radford has the status of an independent city, it is not appreciably larger nor functionally distinct from the other communities.

10. Montgomery County Economic Data Survey, 1965, Richmond: Division of State Planning and Community Affairs, pp. 1-2.

11. Ibid., pp. 12-13.

12. Seymour Sudman, "New Uses of Telephone Methods in Survey Research," Journal of Marketing Research 3 (May, 1966), pp. 163-167.

13. See: Stanley L. Payne, "Some Advantages of Telephone Surveys," Journal of Marketing XX (Jan. 1956), pp. 279-280, or M. A. Baeza, "Sampling and Response Differences for Three Methods of Enumeration Obtained in a Study of Consumer Potato Preference," unpublished Ph. D. Thesis, Michigan State University, 1950.

14. Ralph H. Oakes, "Difference in Responsiveness in Telephone versus Personal Interviews," Journal of Marketing XVIII (Oct. 1954), p. 169.

15. See: Mildred Parten, Surveys, Poll and Samples (New York: Harper and Company, 1950), pp. 79-93, or Don Cohalan, "Measuring Newspaper Readership by Telephone: Two Comparisons with Face-to-Face Interviews," Journal of Advertising Research (Dec. 1960), pp. 1-6.

16. Glen H. Mitchell and Everett M. Rogers, "Telephone Interviewing," Journal of Farm Economics 40 (Aug. 1958), p. 746.

17. Ibid., p. 747.

18. Ibid., p. 746.

19. Sanford L. Cooper, "Random Sampling by Telephone - An Improved Method," Journal of Marketing Research 14 (Nov. 1964), p. 45.

20. Julian L. Simon, Basic Research Methods in Social Science, (New York: Random House, 1969), p. 250.

21. It's doubtful that this is a casual relationship, but more likely it's a selective one; the type of home with a professional journal is one where problem awareness is also likely to be greater.

APPENDIX A

Questionnaire

QUESTIONNAIRE

PERCEPTIONS OF WATER RESOURCE PROBLEMS

A. Introduction

Hello, this is _____. We are making a survey for Virginia Tech, and would appreciate a few minutes of your time. 1 2

3 4

5 6

7. How long have you lived at your present address?

less than 1 year ___(1)
1-2 years ___(2)
3-4 Years ___(3)
5-6 years ___(4)
7-8 years ___(5)
9-10 years ___(6)
11 or more years ___(7)
entire lifetime ___(8)
DK/ref. ___(9)

7

8. Do you live in town or in the country?

rural ___(1)
town ___(2)
city ___(3)
other ___(4)
DK/ref. ___(9)

8

9. Do you own your present home?

yes ___(1) no ___(2)

DK/ref. ___(9)

9

10. single residence ___(1)

multi-residence ___(2)
trailer house ___(3)
other ___(4) 10
DK/ref. ___(9)

11. Where did you live before moving to your present address?

same area (Montgomery Co. or Radford) ___(1)
in Southwest Virginia ___(2)
in Virginia, but not Southwest ___(3) 11
another state (list) _____
East (4), South (5), Midwest (6), Mountain (7), West (8)
DK/ref. ___(9)

12. When you lived _____, was that in a town or in the country?

rural ___(1)
town ___(2)
city ___(3) 12
other ___(4)

What do you think are the major problems facing us today? (Probe for five in rank-order).

13. _____ 13
14. _____ 14
15. _____ 15
16. _____ 16
17. _____ 17
(note if water is listed; ask 20).

DK/ref. ___(9)

18. Have you ever considered water a problem?

yes ___(1) no ___(2) (ask 24) 18

What kinds of problems appear to be associated with water? (Probe).

19. _____ 19

20. _____ 20

21. _____ 21

22. _____ 22

23. _____ 23

DK/ref. ___(9)

24. Have you ever heard or read about water discussed as a problem?

yes ___(1) no ___(2) (ask 33) 24

Where?

25. radio ___(1)
26. T.V. ___(2) 25 26
27. newspapers ___(3)
28. magazines ___(4) 27 28
29. clubs ___(5)
30. friends and/or associates ___(6) 29 30
31. other ___(7) 31

32. What kind of problem was discussed _____ 32

_____

33. Do you think water problems can be solved?

yes ___(1) (ask 35) no ___(2) (ask 34)
DK/ref. ___(9) (ask 41) 33

34. Why not? _____

_____ 34

_____

(ask 41)

35. What do you think should be done to correct the problems?

_____ 35

36. _____ 36

37. _____ 37

38. Who do you think is responsible to see that the water situation is corrected? (If more than one, rank--1 for most important, 2 next, and so on). 38

local agents ___(1)
state agents ___(2)
Federal agents ___(3)
business or industry ___(4)
private citizens ___(5)
other _____ 39

_____ 40

41. Which of the following do you have in your home?

T.V. ___(1)

42. radio ___(2) 41 42

43. newspapers ___ weekly ___(3) daily ___(4)

44. magazines ___(5) Which ones? _____ 43 44

_____ 45

_____

45. professional journals ___(6)
DK/ref. ___(9)

46. To what organizations do you belong? (Probe).

DK/ref. ___(9)

Church: note which _____ 46

47. church related groups, such as committees, men's women's groups, voluntary service: _____

_____ 47

_____

48. job related associations, such as farmer's organizations, business or professional associations, labor unions, etc.:

_____

_____ 48

_____

49. recreational groups, such as bowling league, garden club, card club, etc.:

_____

_____ 49

_____

50. fraternal-service organizations, such as Masons, Eastern Star, service club, hospital auxiliary, etc.:

_____

_____ 50

_____

51. civic-political groups such as P.T.A., planning council, political party club, etc.:

_____ 51

_____

52. adult leadership or youth program such as 4-H Club, YMCA, Scouts, etc.:

_____ 52

_____

53. others, such as Veterans organizations, board member or community agency co-op, etc.:

_____ 53

_____

54. Do you pay the water bill for your residence?

DK/ref ___(9)
yes ___(2)
(ask 55)

no ___(3)
(ask 56) 54

55. Do you feel that the cost of water is:

too high ___(1)
about right ___(2)
too low ___(3)
no opinion ___(4)
DK/ref. ___(9)

55

56. Who does? _____

_____

private source?___

What type? _____

_____ 56

DK/ref. ___(9)

57. Marital status

married ___(1)
single ___(2)
other _____(3) 57

58. How many people live in your household?

adults ___ 58

59. childred ___ 59

60. What is your occupation? _____ 60

61. (If housewife) What is the occupation of your husband?

_____ 61

62. What was the last year of education you completed?

Respondent:

some grade school ___(1)
finished grade school ___(2)
some high school ___(3)
finished high school ___(4)
trade or business school ___(5)
some college ___(6)
finished college ___(7)
post-graduate school ___(8)
DK/ref. ___(9) 62

63. If female, respondants husband:

some grade school ___(1)
finished grade school ___(2)
some high school ___(3)
finished high school ___(4)
trade or business school ___(5)

some college ___(6)
finished college ___(7)
post-graduate school ___(8)
DK/ref. ___(9) 63

64. How old were you on your last birthday?

under 21 ___(1)
21-35 ___(2)
36-44 ___(3)
45-54 ___(4)
55 or over ___(5)
DK/ref. ___(9) 64

65. Would you please tell me, is your total family income between:

under $3,000 ___(1)
3,000-4,999 ___(2)
5,000-7,499 ___(3)
75,00-9,999 ___(4)
10,000-11,999 ___(5)
12,000-14,999 ___(6)
15,000 and over ___(7)
DK/ref. ___(9) 65

66. Respondent:

male ___(1)
female ___(2) 66

Thank you very much for your cooperation.

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