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Attitudes of South Dakotans Toward Water Resources Development

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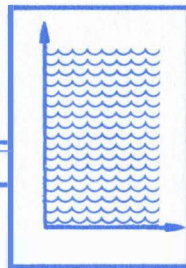
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Attitudes of
South Dakotans
toward

Water Resources Development

Research in Sociology and Water Resource Development in South Dakota



Continuing Series: Water Resource Reports
Rural Sociology Department
Agricultural Experiment Station
South Dakota State University, Brookings

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Attitudes of South Dakotans toward Water Resources Development

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Chapter I

INTRODUCTION

In a report to the South Dakota Water Resources Commission the Business Research Bureau¹ characterized the water situation in the State as enviable. This is an apt description of the water resources within South Dakota. The Gavins Point, Ft. Randall, Oahe, and Big Bend dams—now completed—store within South Dakota's boundaries 34 million acre feet of water (1 acre foot = 325,850 gallons). Ground water, too, constitutes a large and reliable source of water for domestic, industrial, stock, and municipal use in the State. Great portions of South Dakota are underlain by one or more aquifers containing water in varying amounts and quality. These aquifers represent a major undeveloped source of water. Artesian water is also an important water source, especially in the western two-thirds of South Dakota.² Because of this large volume of available water the State currently has no major water shortage.

This is not to say, however, that South Dakota does not have water related problems. Such problems exist, not so much from any real lack of water, as much as from having too much water occasioned by floods, too little water during periods of drought, inability to balance periods of excess with those of scarcity, and difficulty in allocating and distributing water to places of need within the State.³ In fact, maintenance of adequate surface

water supply requires the storing of water during periods of considerable runoff for use during periods of lesser runoff, not only to balance annual seasonal needs, but also to conserve water in beneficent years for use during less precipitant periods years hence.⁴

According to McGuinness:⁵

South Dakota's basic water problems are those related to a surface water supply that commonly is inadequate and variable, and a ground water supply that is abundant in few areas and is generally of poor chemical quality. Chief hopes for the future lie in expanded use of Missouri River water in the part of the State east of the river; additional storage on other streams; development of ground water of fairly good quality from glacial deposits, as well as from other aquifers where they contain such water; and conversion of saline ground water.

Research has increasingly examined the quantity and quality of water resources as they relate to man and his well-being within the society. Although most water resource studies have centered around technical and economic questions, the social aspects of water resource problems and associated development are becoming research areas. For example, research of this kind is necessary in order to

determine how the attitudes of citizens are associated with the recreational, municipal, industrial, agricultural, domestic and health related goals they have for water resource development, allocation and use.⁶

Furthermore, as attempts are made to predict the kinds of demographic and socioeconomic changes that are occurring in South Dakota, interest is developing in how extensively these changes will affect the demand on water resources and how those resources will be used in succeeding decades. As an illustration, Thompson⁷ suggests that by

¹*The Relationship of Water to Industry and Recreation in South Dakota*. Vermillion, South Dakota: University of South Dakota, Business Research Bureau, Sept., 1970, pp. 1-2.

²*Mineral and Water Resources of South Dakota*. Vermillion, South Dakota: South Dakota State Geological Survey, Bulletin No. 16, p. 176.

³*Water in South Dakota for South Dakota*. Brookings, South Dakota: South Dakota State University, Cooperative Extension Service, Circular F535, pp. 1-4.

⁴*Mineral and Water Resources of South Dakota*, p. 175.

⁵C. L. McGuinness, *Water in South Dakota*. Vermillion, South Dakota: South Dakota State Geological Survey and South Dakota State Water Resources Commission, Water Resources Report No. 2, September 25, 1962, p. 22.

⁶Charles A. Ibsen and John A. Ballweg, *Public Perception of Water Resource Problems*. Blacksburg, Va.: Virginia Polytechnic Institute, Water Resources Research Center, Bulletin 29, Sept., 1969, p. 1.

⁷John Thompson, *What Recreation Means to South Dakota*. Brookings, S. D.: South Dakota State University, Cooperative Extension Service, Circular FS111, p. 1.

the year 2000 demands for recreation will be approximately 10 times greater than in 1960. What this increased recreational demand will mean for available water resources and water related recreation sites and activities remains to be seen.

South Dakota has available water resources, therefore related problems rest more in water distribution and application. Research relative to sociological factors associated with water resource development is important for appropriate water resource planning to occur. Consequently, the South Dakota State Water Resources Commission (now known as the Department of Natural Resource Development) entered into a cooperative agreement with the Department of Rural Sociology and the Agricultural Experiment Station of South Dakota State University to conduct research relative to socioeconomic and attitudinal factors as they may relate to water resource development programs. This report is the first of a continuing series of publications planned under this cooperative agreement for submission to the Water Resources Commission and release as bulletins of the South Dakota Agricultural Experiment Station.

Research Questions

This study investigated the following general questions:

1. How do South Dakotans feel about water resource development, and how do these feelings vary from one resident to another?
2. What are some of the discernible demographic and socioeconomic trends of the recent past, and what implications do these trends have for State water resource planning?
3. How does water resource development affect the socioeconomic viability of regions and communities in South Dakota?

Research in these areas is important in order that water resource planning can attain maximum responsiveness to the needs of the various geographic regions and

communities of interest in South Dakota. The successful implementation of water resource programs is dependent on favorable public sentiments toward water resource development and its various dimensions. Furthermore, attention should be directed toward the dissemination of water resource development information in forms suitable for varying target audiences. Additionally, it would be helpful to identify those segments of the population who would benefit most from information efforts related to both the needs and opportunities associated with water resource development.⁸

Consequently, a major concern of this study is to determine the attitudes of South Dakotans toward selected aspects of water resource development and to assess the influence of various socioeconomic factors on the respondents' attitudes. Some factors thought to influence attitudes are family background, age, education, occupation and income, formal and informal associations, and personal values. This suggests that cognitive judgments, life experiences, residence, race and nationality, social class, age, and sex all help explain differing beliefs, varying attitudes and different responses to water resource policies and programs.

Objectives of the Study

The objectives of the study were to determine:

1. The attitudes, opinions, and beliefs of South Dakotans toward water resource development, and to examine the association between these and selected socioeconomic factors.
2. The recent demographic and socioeconomic trends for South Dakota pertinent to water resource development and to examine these for water resource planning implications.
3. The general effects of water resource development programs on the socioeconomic viability of selected regions and communities of South Dakota.

Method of Reporting

The findings relative to the objectives of the study will be reported in several publications released under the general heading "Research in Sociology and Water Resource Development of South Dakota." It is anticipated that the separate publications will contain:

1. A descriptive report of the attitudes of South Dakotans toward water resource development.
2. An analysis of how these attitudes vary from one resident to another.
3. A report as to how much of the variability in attitudes and behavior can be explained by socioeconomic characteristics and related knowledge levels of the respondents.
4. A review of recent socioeconomic trends and their implications for water resource planning, together with an analysis of the way in which water resource development projects affect regional and community socioeconomic viability.
5. An appendix containing research design information and accumulated data.

Data Collection

To collect data for this study, 1,013 heads of households randomly selected throughout the whole State were interviewed personally by trained researchers using a pre-tested standardized questionnaire.

⁸John H. Peterson, Jr. and Peggy J. Ross, *Changing Attitudes Toward Watershed Development*. State College, Miss.: Mississippi State University. Water Research Institute, 1971, pp. 36-40.

Chapter II

GENERAL FINDINGS

This section reports findings regarding the attitudes of South Dakotans as a whole toward selected aspects of water resource development. It should be emphasized that these findings represent the attitudes identified for the total South Dakota sample. A later report will examine the data for variability when respondents are grouped according to residential location, age, educational attainment, sex and similar socioeconomic characteristics.

For this study, the attitudes of South Dakotans toward water development are reported as follows: Cognitive Knowledge Levels, Attitudes toward Various Aspects of Water Development, Extent of Willingness to Support Water Development Programs, and Water Development Policies.

Cognitive Knowledge Levels

The cognitive knowledge level of the respondent was measured in three areas: Knowledge of Water Quantity, Knowledge of Water Quality, and Knowledge of Water Resource Development. The findings are reported in the following tables.

Knowledge of Water Quantity. Respondents indicated the extent of their agreement or disagreement to five stimulus statements pertaining to water quantity. Responses by number and percent to each stimulus statement are reported in Table 1.

Over half of the respondents disagreed with the statement, "In South Dakota, the depth of underground water does not vary more than fifty feet," whereas only four percent agreed. Forty-three percent of the respondents were undecided as to the range of variant water depths. The statement was incorrect.

More than two-thirds (68 percent) of the respondents disagreed with the statement that underground water does not move. One-fourth of the respondents were unsure, and five percent thought that

underground water does not move. This statement was also an incorrect one.

Over three-fourths (78 percent) of the respondents agreed that the underground water supply can be exhausted. Fifteen percent were undecided, and seven percent of the respondents disagreed with the statement, "The underground water supply can be exhausted." The correct response was "agree."

Two statements were used to measure respondent's knowledge relative to the mining of water. Over half of the respondents were undecided as to whether the mining of water means taking more water from the ground than is naturally replaced over a period of time. Forty-one percent agreed with the statement and eight percent disagreed. The statement was true. Three out of four respondents were undecided about the legality of mining water in the State. Sixteen percent responded that mining water is legal in South Dakota, and ten percent thought it was not. By sta-

tutory provision, to mine water is illegal in South Dakota.

In general, South Dakotans are uncertain about the various aspects of water quantity. Respondents were particularly unsure as to what constitutes the mining of water and whether water mining is illegal.

Knowledge of Water Quality. Respondents indicated the extent of their agreement or disagreement with stimulus statements pertaining to water quality. Responses by number and percent for each stimulus statement are reported in Table 2.

Twenty-eight percent of the respondents agreed with the statement, "South Dakota law permits individuals to sue water polluters." Again, a large majority of respondents (62 percent) were undecided. Ten percent of the respondents did not think that state law allowed individuals to sue water polluters. South Dakota law permits suing water polluters.

Nearly three-fourths of the respondents agreed that some lakes

Table 1. Responses to statements regarding knowledge of water quantity, by number and percentage.

Statement	Agree	Undecided	Disagree
A. "In South Dakota, the depth of underground water does not vary more than fifty feet." (Statement is false)	42 4.1	435 42.9	536 52.9
B. "Underground water does not move." (Statement is false.)	53 5.2	270 26.7	690 68.1
C. "The underground water supply can be exhausted." (Statement is true.)	789 77.9	155 15.3	69 6.8
D. "Mining of water is taking more water from the ground than is naturally replaced over a period of time." (Statement is true.)	413 40.8	523 51.6	77 7.6
E. "The mining of water is illegal in South Dakota." (Statement is false)	97 9.6	751 74.1	165 16.3

Table 2. Responses to statements regarding knowledge of water quality, by number and percentage.

Statement	Agree	Undecided	Disagree
A. "South Dakota law permits individuals to sue water polluters." (Statement is true.)	282 27.8	631 62.3	100 9.9
B. "Even if there were no people living in South Dakota, some lakes would still turn into swamps." (Statement is true.)	740 73.1	129 12.7	144 14.2

would still turn into swamps even if no people lived in South Dakota. The remainder were also equally divided between those who were undecided and those who disagreed with the statement, 13 percent and 14 percent, respectively. The statement was correct.

In general, South Dakotans agree that even if there were no people living in South Dakota some lakes would still turn into swamps, and are uncertain whether South Dakota law permits individuals to sue water polluters.

Knowledge of Water Resource Development. Respondents indicated the extent of their agreement or disagreement with four stimulus statements pertaining to water resource development. Responses by number and percent to each statement are reported in Table 3.

Over half of the respondents disagreed with the statement, "Persons whose property lies along a body of water have the legal right to use as much of that water as they choose." One out of five respondents agreed with the statement, and one out of four was undecided. The statement was incorrect.

Fifty-three percent of the respondents disagreed with the statement that a farmer has the legal right to build reservoirs on any natural streams passing through his property. Twenty-nine percent were undecided, and 18 percent agreed. Farmers do have such a right.

Most of the respondents (82 percent) agreed that a farmer has the legal right to dig a stock pond on his farm. Twelve percent were undecided, and 6 percent disagreed with the statement. The statement was true.

Regarding irrigation, 62 percent of the respondents were uncertain as to whether, "No one is allowed to irrigate more than one-half acre of land without approval by a government agency." Among the remaining, twice as many respondents (25 percent) agreed with the statement as disagreed (13 percent). The statement was true.

Table 3. Responses to statements regarding knowledge of water resource development, by number and percentage.

Statement	Agree	Undecided	Disagree
A. "Persons whose property lies along a body of water have the legal right to use as much of that water as they choose." (Statement is false.)	199 19.6	268 26.5	546 53.9
B. "A farmer has the legal right to build reservoirs on any natural streams passing through his property." (Statement is true.)	185 18.3	289 28.5	539 53.2
C. "Legally, a farmer has the right to dig a stock pond on his farm." (Statement is true.)	831 82.0	118 11.6	64 6.3
D. "No one is allowed to irrigate more than one-half acre of land without approval by a government agency." (Statement is true.)	254 25.1	629 62.1	130 12.8

Some uncertainty about water development rights exists among South Dakotans. A substantial number of respondents, however, do not agree that persons whose property lies along a body of water have the legal right to use as much of that water as they choose, nor do they agree that a farmer has the legal right to build reservoirs on any natural streams passing through his property. However, four-fifths of the respondents agreed that a farmer has the legal right to dig a stock pond on his farm, and almost two-thirds were uncertain as to whether it is allowable to irrigate more than one-half acre of land without approval by a government agency.

Attitudes Toward Various Aspects of Water Development

The attitudes of South Dakotans toward water resources and water development were measured in six areas: Water Quantity; Water Quality; Reservoirs, Dams, Flood Control and Watershed Programs; Financing and Taxation; Development Benefits; and Planning of Water Development Programs. The findings are reported in the following tables.

Attitudes Toward Water Quantity. Respondents indicated the extent of agreement or disagreement with twelve stimulus statements pertaining to water quantity. Responses by number and percent are reported in Table 4.

Nearly 58 percent of the respondents agreed with the statement, "The underground water supply is adequate in this county." Twenty percent were undecided as to whether

the county's underground water supply was adequate, and 22 percent disagreed with the statement.

Most respondents (63 percent) agreed that low water pressure is not a problem in their area. Twenty-nine percent of the respondents disagreed with the statement, and eight percent were uncertain.

Just over half the respondents agreed with the statement, "The communities around here have adequate water systems." Thirty-five percent of the respondents disagreed, and 14 percent were undecided. A smaller proportion, 45 percent of the respondents, agreed that area farms have adequate water systems; thirty-six percent of the respondents disagreed, and 19 percent were undecided.

Most respondents (60 percent) agreed with the statement, "In this area the water use is increasing so much that additional water sources are needed." Twenty-seven percent of the respondents disagreed with the statement, and 13 percent were undecided whether water usage exceeded supplies.

Only slightly more respondents agreed than disagreed with the statement, "A desirable way to supply water to areas of need in South Dakota is to transfer it from one area of the state to another." Forty-one percent agreed, and 37 percent disagreed.

The respondents were fairly evenly divided in their responses to the statement, "Irrigating by mining underground waters is preferable to rationing food." Thirty-five per-

cent agreed, 36 percent were undecided, and 29 percent disagreed.

Ten percent of the respondents were undecided when asked to respond to the statement, "South Dakota, as a whole, has enough lakes." Fifty-eight percent of the respondents agreed that there are enough lakes in the State, and 32 percent of the respondents disagreed.

Seventy-six percent of the respondents agreed that not enough moisture is received in their counties each year. A small percentage of respondents (5 percent) was undecided, and 19 percent disagreed regarding the inadequacy of water.

The respondents were almost equally divided in their responses to the statement, "Cloud seeding is a desirable way to increase the amount of rainfall around here." Thirty-eight percent of the respondents agreed, 34 percent disagreed, and 29 percent were undecided.

Almost two-thirds of the respondents

agreed with the statement, "In this county, water is used wisely," compared to 21 percent disagreeing.

Over half of the respondents disagreed with the statement, "The amount of water people use depends upon the price of it." Thirty-eight percent of the respondents agreed that the price of water affects the amount people use. Eight percent of the respondents were undecided about the statement.

In general, South Dakotans agree that:

1. On an average, their county does not receive enough moisture each year.
2. Water is used wisely in their county.
3. Low water pressure is not a problem in their locality.
4. Area water use is increasing so much that additional water sources are needed.
5. The State, as a whole, has enough lakes.

6. The underground water supply is adequate in their county.

7. The surrounding communities have adequate water systems.

South Dakotans, while somewhat evenly divided as to the extent of agreement or disagreement, tend to feel that:

1. The farms in their locality have adequate water systems. In light of the active interest in forming and funding special districts in some areas for the purpose of creating rural water systems, the somewhat even distribution of responses to this statement may not indicate lessened State-wide concern for improved rural water supplies, but may reflect the fact that residents vary from area to area regarding the adequacy of local farm water systems.

Table 4. Responses to statements regarding attitudes toward water quantity, by number and percentage.

Statement	Strongly Agree	Agree	Somewhat Agree	Undecided	Somewhat Disagree	Disagree	Strongly Disagree
A. "The underground water supply is adequate in this county."	52 5.1	413 40.8	119 11.7	208 20.5	78 7.7	105 10.4	38 3.8
B. "Low water pressure is not a problem around here."	37 3.7	508 50.1	92 9.6	77 7.6	77 7.6	168 16.6	54 5.3
C. "The communities around here have adequate water systems."	20 2.0	339 33.5	155 15.3	142 14.0	124 12.2	196 19.3	37 3.7
D. "The farms around here have adequate water systems."	16 1.6	290 28.6	148 14.6	194 19.2	146 14.4	185 18.3	34 3.4
E. "In this area the water use is increasing so much that additional water sources are needed."	103 10.2	348 34.4	153 15.1	135 13.3	86 8.5	167 16.5	21 2.1
F. "A desirable way to supply water to areas of need in South Dakota is to transfer it from one area of the state to another."	4 0.4	249 24.6	159 15.7	227 22.4	123 12.1	229 22.6	22 2.2
G. "Irrigating by mining underground waters is preferable to rationing food."	15 1.5	254 25.1	89 8.8	360 35.5	84 8.3	192 19.0	19 1.9
H. "South Dakota, as a whole, has enough lakes."	32 3.2	417 41.2	144 14.2	97 9.6	112 11.1	176 17.4	35 3.5
I. "On the average, this county does not receive enough moisture each year."	123 12.1	485 47.9	160 15.8	51 5.0	72 7.1	110 10.9	12 1.2
J. "Cloud seeding is a desirable way to increase the amount of rainfall around here."	34 3.4	212 20.9	135 13.3	292 28.8	75 7.4	194 19.2	71 7.0
K. "In this county, water is used wisely."	24 2.4	456 45.0	167 18.5	135 13.3	110 10.9	77 7.6	24 2.4
L. "The amount of water people use depends upon the price of it."	26 2.6	218 21.5	146 14.4	84 8.3	94 9.3	389 38.4	56 5.5

2. Water transfer from one part of the State to another is a desirable way to supply water to areas of need.
3. Cloud seeding is a desirable way to increase rainfall in the local area.
4. Irrigating by mining underground waters is preferable to rationing food.

South Dakotans do not agree that the amount of water people use depends upon its cost.

Attitudes Toward Water Quality. Respondents indicated the extent of their agreement or disagreement with eight stimulus statements pertaining to water quality. Responses by number and percent to each stimulus statement are reported in Table 5.

Seventy percent of the respondents agreed that the quality of water in households in their area was satisfactory. Three percent of the respondents were undecided about this statement, and 27 percent disagreed.

One out of five respondents agreed that nothing can be done to affect the quality of underground water. Three out of five respondents disagreed with the statement; the remaining respondents were undecided.

Forty-one percent of the respondents agreed with the statement, "Water pollution is not a major

problem in this area." Just over half of the respondents disagreed, and six percent were undecided.

Eleven percent of the respondents were undecided regarding the statement, "Waste disposal methods are a major source of water pollution around here." One-third of the respondents disagreed with the statement, and over one-half agreed.

Eight out of ten respondents agreed that water pollution laws need stricter enforcement. Eight percent of the respondents disagreed, and 12 percent were undecided as to the degree to which water laws were enforced.

Eleven percent disagreed with the statement, "Penalties for water polluting are not severe enough." One-fourth of the respondents were undecided about the severeness of water pollution penalties, and 65 percent agreed.

Nearly three-fourths of the respondents agreed with the statement, "Sections of rivers still in their natural state should be left that way." One hundred and eighty-eight respondents (19 percent) disagreed with the statement, and nine percent were undecided.

A substantial number of the respondents (86 percent) agreed that more effort should be made to reclaim dying lakes in South Dakota. Six percent of the respondents

disagreed, and eight percent were undecided.

In general, South Dakotans agree that:

1. More effort should be made to reclaim dying lakes in the State.
2. Water pollution laws need stricter enforcement.
3. Sections of rivers still in their natural state should be left that way.
4. The quality of water in area households is satisfactory. The quality of water in households is satisfactory for most respondents; however, the fact that slightly more than one-fourth of those interviewed indicated dissatisfaction with the water quality may indicate need for improvement in some areas. A recent study by Diggins and Fasbender, for example, found that 69 percent of the shallow wells, 24 percent of the 200-300 feet wells, and 17 percent of the artesian wells were contaminated and unsafe for drinking in Aurora and Brule counties.
5. Penalties for polluting water should be more severe.
6. Waste disposal methods are a major source of water pollution in their area.

Table 5. Responses to statements regarding attitudes toward water quality, by number and percentage.

Statement	Strongly Agree	Agree	Somewhat Agree	Undecided	Somewhat Disagree	Disagree	Strongly Disagree
A. "The quality of water in households around here is satisfactory."	52 5.1	532 52.5	129 12.7	26 2.6	102 10.1	143 14.1	29 2.9
B. "There is nothing anyone can do to affect the quality of underground water."	18 1.8	136 13.4	59 5.8	180 17.8	103 10.2	406 40.1	111 11.0
C. "Water pollution is not a major problem in this area."	23 2.3	292 28.8	103 10.2	59 5.8	115 11.4	281 27.7	140 13.8
D. "Waste disposal methods are a major source of water pollution around here."	92 9.1	316 31.2	151 14.9	115 11.4	89 8.8	234 23.1	16 1.6
E. "Water pollution laws need stricter enforcement."	171 16.9	516 50.9	119 11.7	124 12.2	31 3.1	49 4.8	3 0.3
F. "Penalties for water polluting are not severe enough."	126 12.4	388 38.3	149 14.7	242 23.9	40 3.9	59 5.8	9 0.9
G. "Sections of rivers still in their natural state should be left that way."	168 16.6	456 45.0	107 10.6	94 9.3	84 8.3	89 8.8	15 1.5
H. "More effort should be made to reclaim dying lakes in South Dakota."	128 12.6	581 57.4	160 15.8	83 8.2	23 2.3	34 3.4	4 0.4

South Dakotans do not agree that:

1. Nothing can be done to affect the quality of underground water.
2. Water pollution is not a major problem in their area.

Attitudes Toward Reservoirs, Dams, Flood Control and Watershed Programs. Respondents indicated the extent of their agreement or disagreement with seven stimulus statements pertaining to various water development programs. Responses by number and percent to each statement are reported in Table 6.

The majority of respondents (58 percent) disagreed with the statement, "South Dakota already has enough small dams." Twenty-three percent agreed, and 19 percent were undecided.

Most respondents (69 percent) disagreed with the statement, "Building reservoirs for boating and fishing is more desirable than preserving streams and lakes in their natural state." Eighteen percent of the respondents agreed, and 13 percent were undecided.

One out of five respondents was undecided about the statement, "Reservoirs flood land worth more than the benefits derived from their construction." Another 20 percent agreed, and three out of five respondents disagreed with the statement.

When read the statement, "There is too much emphasis on flood control programs in this county," 71 percent of the respondents disagreed. Eleven percent of the respondents agreed that too much emphasis was placed on flood control programs in their county, and 18 percent were undecided.

Sixty-one percent of the interviewed sample agreed with the statement, "Everyone in the county will benefit from the watershed program." Of those remaining, twice as many respondents were undecided about the statement as disagreed with the statement.

Eight percent of the respondents agreed with the statement, "The watershed program is being pushed too hard in this county." Thirty-four percent of the respondents were undecided on this issue, and the majority (58 percent) disagreed with the statement.

Thirty-six percent of the respondents agreed that landowners have little opportunity to express their opinions in planning watershed programs. Forty-one percent of the respondents disagreed, and 23 percent of the respondents were undecided.

In general, South Dakotans agree that everyone in the county will benefit from the watershed program.

South Dakotans do not agree that:

1. Too much emphasis is placed on flood control programs.
2. Building reservoirs for boating and fishing is more desirable than preserving streams and lakes in their natural state.
3. Land flooded by reservoirs is worth more than the benefits derived from their construction.
4. There are enough small dams in the State.
5. The watershed program is being pushed too hard in their county.

South Dakotans, although somewhat divided as to the extent of agreement or disagreement, tend to disagree with the statement that there is little opportunity for landowners to express opinions in planning watershed programs.

Attitudes Toward Financing and Taxation. Respondents indicated the extent of their agreement or disagreement with seven stimulus statements pertaining to the financing and taxation of water resource projects. Responses by number and percent to each statement are reported in Table 7.

Two-thirds of the respondents did not agree that the costs of flood control should be limited to those who benefit directly. One-fifth of

Table 6. Responses to statements regarding attitudes toward reservoirs, dams, flood control and watershed programs, by number and percentage.

Statement	Strongly Agree	Agree	Somewhat Agree	Undecided	Somewhat Disagree	Disagree	Strongly Disagree
A. "South Dakota already has enough small dams."	12	139	83	192	112	423	52
	1.2	13.7	8.2	19.0	11.1	41.8	5.1
B. "Building reservoirs for boating and fishing is more desirable than preserving streams and lakes in their natural state."	14	95	71	134	187	421	91
	1.4	9.4	7.0	13.2	18.5	41.6	9.0
C. "Reservoirs flood land worth more than the benefits derived from their construction."	13	107	89	201	134	404	65
	1.3	10.6	8.8	19.8	13.2	39.9	6.4
D. "There is too much emphasis on flood control programs in this county."	9	56	47	182	157	506	56
	0.9	5.5	4.6	18.0	15.5	50.0	5.5
E. "Everyone in the county will benefit from the watershed program."	28	405	188	265	66	59	2
	2.8	40.0	18.6	26.2	6.5	5.8	0.2
F. "The watershed program is being pushed too hard in this county."	5	34	45	343	178	388	20
	0.5	3.4	4.4	33.9	17.6	38.3	2.0
G. "Landowners have little opportunity to express their opinions in planning watershed programs."	23	184	155	234	178	232	7
	2.3	18.2	15.3	23.1	17.6	22.9	0.7

Table 7. Responses to statements regarding attitudes toward financing and taxation, by number and percentage.

Statement	Strongly Agree	Agree	Somewhat Agree	Undecided	Somewhat Disagree	Disagree	Strongly Disagree
A. "People who directly benefit from flood control should pay the total cost for it."	14 1.4	113 11.2	86 8.5	129 12.7	160 15.8	443 43.7	68 6.7
B. "People who use irrigation water should pay the entire cost of the irrigation project."	44 4.3	278 27.4	155 15.3	100 9.9	178 17.6	244 24.1	14 1.4
C. "More tax monies should be spent to increase the number of large reservoirs in the state."	18 1.8	226 22.3	218 21.5	188 18.6	122 12.0	210 20.7	31 3.1
D. "More tax monies should be spent to increase water areas for wildlife in South Dakota."	49 4.8	283 27.9	237 23.4	113 11.2	123 12.1	189 18.7	19 1.9
E. "A rural delivery system which pipes water to each farm would be worth the cost to the farmer involved."	29 2.9	297 29.3	142 14.0	222 21.9	94 9.3	195 19.2	34 3.4
F. "More money should be spent studying the way water resource projects affect the environment."	47 4.6	412 40.7	223 22.0	173 17.1	62 6.1	90 8.9	6 0.6
G. "When land is purchased for water resource projects, people are paid less than their land is actually worth."	15 1.5	152 15.0	76 7.5	374 36.9	115 11.4	258 25.5	23 2.3

the respondents agreed that people who directly benefit from flood control should pay the total cost, and 13 percent were undecided.

When read the statement, "People who use irrigation water should pay the entire cost of the irrigation project," almost one-half (47 percent) of the respondents agreed. Forty-three percent of the respondents disagreed, and ten percent of the respondents were undecided.

Forty-six percent of the respondents agreed that more tax monies should be spent to increase the number of large reservoirs in the State. Thirty-six percent of the respondents disagreed, and 19 percent were undecided.

One out of three respondents dis-

agreed with the statement, "More tax monies should be spent to increase water areas for wildlife in South Dakota." Eleven percent of the respondents were undecided. Over half of the respondents agreed more tax monies should be spent in order to increase water areas for wildlife in the State.

Forty-one percent of the respondents agreed that a rural delivery system which pipes water to each farm would be worth the cost to the farmer involved. However, one out of three respondents disagreed, and 22 percent of the respondents were undecided.

Two-thirds of the respondents agreed that more money should be spent studying the way water re-

source projects affect the environment. The remaining respondents were undecided (17 percent) or disagreed (16 percent).

The most respondents (39 percent) disagreed with the stimulus statement, "When land is purchased for water resource projects, people are paid less than their land is actually worth." Thirty-seven percent of the respondents were undecided, and 24 percent agreed.

In general South Dakotans agree that:

1. More money should be spent studying the way water resource projects affect the environment.
2. More tax monies should be spent to increase water areas for wildlife in the State.

Table 8. Responses to statements regarding attitudes toward development benefits, by number and percentage.

Statement	Strongly Agree	Agree	Somewhat Agree	Undecided	Somewhat Disagree	Disagree	Strongly Disagree
A. "Water resource projects in South Dakota benefit people around here."	39 3.8	546 53.9	183 18.1	98 9.7	33 3.3	103 10.2	11 1.1
B. "Only people who live adjacent to water resource developments benefit from these projects."	5 0.5	108 10.7	78 7.7	83 8.2	153 15.1	527 52.0	59 5.8
C. "In the long run, increased water resource development is an effective way to provide more jobs for South Dakotans."	41 4.0	536 52.9	286 28.2	93 9.2	26 2.6	29 2.9	2 0.2
D. "The future of this county's economic growth depends largely on the conservation of its water resources."	56 5.5	502 49.6	236 23.3	87 8.6	74 7.3	55 5.4	3 0.3
E. "The development of irrigation projects would be of long-term benefit to this county."	73 7.2	519 51.2	166 16.4	107 10.6	60 5.9	80 7.9	8 0.8
F. "Increasing water surface area will cause more problems with gnats and mosquitoes."	25 2.5	321 31.7	183 18.1	118 11.6	106 10.5	250 24.7	10 1.0

South Dakotans, while somewhat divided as to the extent of agreement or disagreement, tend to feel that:

1. People using irrigation water should pay the entire cost of the irrigation project.
2. Piping water to each farm via a rural delivery system would be worth the cost to the farmer involved.
3. More tax monies should be spent to increase the number of large reservoirs in the State.

South Dakotans, although somewhat divided, tend to disagree with the statement that owners are paid less than true value when their land is purchased for water resource projects.

South Dakotans generally disagree with the statement that those directly benefiting from flood control should pay the total cost of it.

Attitudes Toward Development Benefits. Respondents indicated the extent of their agreement or disagreement with six stimulus statements pertaining to development benefits. Responses by number and percent to each statement are reported in Table 8.

Over one-half of the responses agreed with the statement, "Water resource projects in South Dakota benefit people around here." Fifteen percent of the respondents dis-

agreed with the statement, and ten percent were undecided.

Almost three-fourths of the respondents (73 percent) disagreed with the statement that only people who live adjacent to water resource developments benefit from these projects. Nineteen percent of the respondents agreed with the statement, and eight percent were undecided.

Eighty-five percent of the respondents agreed with the statement, "In the long run, increased water resource development is an effective way to provide more jobs for South Dakotans." Nine percent of the respondents were undecided, and six percent of the respondents did not feel that increased water resource development would increase the number of jobs for state residents.

Almost four out of five respondents agreed with the statement, "The future of this county's economic growth depends largely on the conservation of its water resources." Thirteen percent of the respondents disagreed with the statement, and nine percent were undecided.

Three-fourths of the respondents agreed that the development of irrigation projects would be of long-term benefit to their county. Fourteen percent disagreed with the statement, and 11 percent were undecided.

Over half of the respondents agreed that increasing water surface area will cause more problems with gnats and mosquitoes. Twelve percent of the respondents were undecided, and 36 percent disagreed.

In general, South Dakotans agree that:

1. Increased water resource development is an effective way to provide more jobs for South Dakotans.
2. The future of the county's growth is dependent largely on the conservation of its water resources.
3. State water resource projects benefit area people.
4. The development of irrigation projects would be of long-term benefit.
5. More problems with gnats and mosquitoes will be a result of increasing water surface area.

South Dakotans do not agree that only people living near water resource developments benefit from them.

Attitudes Toward the Planning of Water Resource Projects. Respondents indicated the extent of their agreement or disagreement with seven stimulus statements pertaining to the planning of water resource projects. Responses by number and percent to each statement are reported in Table 9.

Table 9. Responses to statements regarding attitudes toward the planning of water resource projects, by number and percentage.

Statement	Strongly Agree	Agree	Somewhat Agree	Undecided	Somewhat Disagree	Disagree	Strongly Disagree
A. "There are no water problems in South Dakota that technology cannot solve."	20 2.0	256 25.3	129 12.7	275 27.1	125 12.3	188 18.6	20 2.0
B. "A good way to meet future water shortages in South Dakota is to recycle sewage for human drinking purposes."	10 1.0	111 11.0	120 11.8	198 19.5	109 10.8	347 34.3	118 11.6
C. "No matter how much planning is done, South Dakota is going to have a water problem."	21 2.1	312 30.8	225 22.2	157 15.5	138 13.6	150 14.8	10 1.0
D. "The best place to plan water resource projects is on the state level."	25 2.5	449 44.3	155 15.3	166 16.4	94 9.3	111 11.0	13 1.3
E. "People have little opportunity to express their opinions in planning water development programs."	42 4.1	312 30.8	163 16.1	148 14.6	134 13.2	200 19.7	14 1.4
F. "Government officials don't pay enough attention to local water needs."	56 5.5	371 36.6	214 21.1	197 19.4	87 8.6	86 8.5	2 0.2
G. "Use of the State's water resources for industrial purposes is more important than using these for recreational activities."	19 1.9	330 32.6	189 18.7	157 15.5	133 13.1	159 15.7	26 2.6

Twenty-seven percent of the respondents were undecided about the statement, "There are no water problems in South Dakota that technology cannot solve." The remaining respondents were almost equally divided in agreeing (38 percent) and disagreeing (33 percent) with the statement.

Over half (57 percent) of the respondents did not agree that recycling sewage for human drinking purposes is a good way to meet future water shortages in the State. Twenty percent were undecided, and 24 percent of the respondents agreed with the statement.

The majority of respondents agreed that South Dakota is going to have a water problem no matter how much planning is done. Sixteen percent of the respondents were undecided, and 29 percent of the respondents disagreed.

Most of the respondents (62 percent) agreed the best place to plan water resource projects is on the State level. Sixteen percent of the respondents were undecided, and 22 percent of the respondents disagreed.

Fifty-one percent of the respondents agreed that people have little opportunity to express their opinions in planning water development programs. One-third of the respondents disagreed with this statement, and 15 percent of the respondents were undecided.

Nineteen percent of the respondents were undecided about the statement, "Government officials don't pay enough attention to local water needs." Seventeen percent of the respondents disagreed with the statement, but almost two-thirds of

the respondents (63 percent) agreed.

Over half (53 percent) of the respondents agreed that use of the State's water resources for industrial purposes is more important than using these resources for recreational activities. Fifteen percent were undecided; thirty-one percent disagreed.

In general, South Dakotans agree that:

1. Government officials don't pay enough attention to local water needs.
2. The State level is the best place to plan water resource projects.
3. In spite of planning, South Dakota is going to have a water problem.
4. The use of the State's water resources for industry is more important than using them for recreational activities.
5. People have little opportunity to express their opinions in planning water development programs.

South Dakotans are somewhat evenly divided as to whether there are no water problems in South Dakota that technology cannot solve.

South Dakotans do not agree that recycling sewage for human drinking purposes is a good way to meet future State water shortages.

Extent of Willingness to Support Water Development Programs. Respondents indicated the extent of their agreement or disagreement with four stimulus statements pertaining to their extent of willing-

ness to support water development programs. Responses by number and percent to each statement are reported in Table 10.

A majority of the respondents (64 percent) agreed with the statement, "Citizens like me should be willing to spend more money for improved water supply in this county." Sixteen percent of the respondents were undecided, and 20 percent of the respondents disagreed.

The majority of respondents agreed with the statement, "Persons like me should become more actively involved in solving or preventing local water pollution." The remaining respondents were almost equally divided between those disagreeing with the statement (9 percent) and those undecided about the statement (8 percent).

Almost all respondents (86 percent) agreed that it was their responsibility to cooperate when asked to participate in local flood control planning. Six percent of the respondents disagreed, and seven percent were undecided.

Almost half of the respondents agreed that it was their responsibility to encourage irrigation development in their county. Twenty-nine percent of the respondents disagreed with the statement, and 20 percent were undecided.

In general, South Dakotans agree that:

1. It is their responsibility to cooperate in local flood control planning.
2. People like them should become more actively involved in solving or preventing local water pollution.

Table 10. Responses to statements regarding extent of willingness to support water development programs, by number and percentage.

Statement	Strongly Agree	Agree	Somewhat Agree	Undecided	Somewhat Disagree	Disagree	Strongly Disagree
A. "Citizens like me should be willing to spend more money for improved water supply in this county."	32 3.2	345 34.1	275 27.1	162 16.0	75 7.4	104 10.3	20 2.0
B. "Persons like me should become more actively involved in solving or preventing local water pollution."	78 7.7	556 54.9	215 21.2	78 7.7	33 3.3	47 4.6	6 0.6
C. "It's my responsibility to cooperate when asked to participate in local flood control planning."	60 5.9	609 60.1	206 20.3	75 7.4	28 2.8	27 2.7	8 0.8
D. "It's my responsibility to encourage irrigation development in this county."	23 2.3	268 26.5	209 20.6	215 21.2	113 11.2	166 16.4	19 1.9

3. Citizens like them should be willing to spend more money for improved county water supply.

South Dakotans, although somewhat divided as to the extent of agreement or disagreement, tend to feel that it is their responsibility to encourage irrigation development in their county.

Water Development Policies. The study attempted to determine the respondents' perceptions of past water development program emphasis and the type of water development programs they would emphasize.

Respondents were asked to rank the following areas of water development in order from those they felt received the most emphasis to those receiving the least emphasis in the past in South Dakota: recreational use, agricultural use, industrial use, and domestic use. Table 11 reports the rank-ordered responses by frequency and percent. When selecting a use area as the one felt to have received the most emphasis in the past, 38 percent of the respondents answered recreational use, 25 percent selected agricultural use, 18 percent chose industrial use, and 18 percent responded domestic use.

To compare only the first place responses, however, may not be the best indicator as to how respondents felt as to which water area had received the most emphasis in the past in South Dakota. The sentiments of the respondents regarding past emphasis are also reflected in second, third and fourth place rankings. Consequently, for comparison purposes, the rank order values of first, second, third and fourth were assigned the weighted values four, three, two and one, respectively. Then, for each water use category, the rank-ordered frequencies were multiplied by their appropriate weighted value to attain a weighted product, and the weighted products for each water use category were summed.

Table 12 reports the findings when the responses are converted into weighted products and summed. Using this method for comparison, the respondents felt that

recreational use had received the most emphasis in the past, with agricultural use, domestic use, and industrial use having been emphasized second, third and fourth, respectively.

Respondents were also asked, "If you were serving on a State water development agency, which of those same areas would you emphasize?" Table 13 reports the rank-ordered responses by frequency and percent. When selecting a use area as the one they felt they would emphasize most if serving on a State water development agency, almost 50 percent answered domestic use, 22 percent selected industrial use, 21 percent chose agricultural use,

and 6 percent responded recreational use.

Again, to compare only the first place responses may not be the best indicator as to how respondents felt as to which water use area they would emphasize most if they were serving on a State water development agency. Consequently, for comparison, summed product weights were calculated in the manner reported in the preceding paragraphs.

Table 14 reports the findings when the responses are converted into weighted products and summed. The respondents felt that they would emphasize domestic use the most, and agricultural use, indus-

Table 11. Rank-order responses by frequency and percent to the statement: "Which of the following areas of water development do you feel has received the most emphasis in the past in South Dakota?"

	Recreation		Agriculture		Industry		Domestic	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
First	389	38.4	255	25.2	186	18.4	180	17.8
Second	228	22.5	313	30.9	272	26.9	196	19.3
Third	146	14.4	210	20.7	241	23.8	413	40.8
Fourth	247	24.4	232	22.9	311	30.7	221	21.8
Total	1010*	100.0	1010	100.0	1010	100.0	1010	100.0

*There were three no-responses to the questions reported in Tables 11-12.

Table 12. Weighted responses to the statement: "Which of the following areas of water development do you feel has received the most emphasis in the past in South Dakota?"

	Recreation		Agriculture		Industry		Domestic	
	Number	Weighted Product	Number	Weighted Product	Number	Weighted Product	Number	Weighted Product
First	389	1556	255	1020	186	744	180	720
Second	228	684	313	939	272	816	196	588
Third	146	292	210	420	241	482	413	826
Fourth	247	247	232	232	311	311	221	221
Product Total		2779		2611		2353		2355

Table 13. Rank-order responses by frequency and percent to the statement: "If you were serving on a state water development agency, which of those same areas of development would you emphasize?"

	Recreation		Agriculture		Industry		Domestic	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
First	56	5.5	212	20.9	227	22.4	515	50.8
Second	416	41.1	346	34.2	149	14.7	105	10.4
Third	150	14.8	219	21.6	351	34.6	290	28.6
Fourth	390	38.5	235	23.2	285	28.1	102	10.1
Total	1012*	100.0	1012	100.0	1012	100.0	1012	100.0

*There was one no-response for this category.

trial use, and recreational use would be emphasized second, third and fourth, respectively.

South Dakotans as a whole feel that recreational use has received

the most emphasis in the past. They would most emphasize future development for domestic use if they served on a State water development agency.

Table 14. Weighted responses to the statement: "If you were serving on a state water development agency, which of those same areas of development would you emphasize?"

	Recreation		Agriculture		Industry		Domestic	
	Number	Weighted Product	Number	Weighted Product	Number	Weighted Product	Number	Weighted Product
First	56	224	212	848	227	908	515	2060
Second	416	1248	346	1038	149	447	105	315
Third	150	300	219	438	351	702	290	580
Fourth	390	390	235	235	285	285	102	102
Product Total		2172		2559		2342		3057

Chapter III

CONCLUSIONS AND IMPLICATIONS

The purpose of this first report was to present a descriptive summary of the findings regarding the attitudes of South Dakotans as a whole toward selected aspects of water resource development.

Descriptive summaries, however, would not be complete unless analyzed as to possible conclusions and implications pertinent to policy formulation and program planning, implementation and evaluation, particularly as they may relate to agencies concerned with water resource development. This chapter, therefore, discusses conclusions pertinent to the general descriptive findings and some implications suggested by those conclusions. The chapter concludes with a general summary, together with a statement indicating the material to be presented in the forthcoming second report.

Conclusions

The findings support the following conclusions:

1. General Knowledge Level. South Dakota residents were generally uncertain about many aspects of water quality and quantity. Residents possessed a greater knowledge of the physical properties of water than they did regarding the legal aspects of water quantity and quality. A qualification is appropriate at this point. Nearly three-fourths of the respondents were uncertain regarding the legality of mining water. This uncertainty may be due to the fact that although South Dakota statutes prohibit mining water, mining for domestic use has been accepted in the past. This has been especially true regarding artesian waters.

Knowledge of laws concerning water resource development was greater than for water quantity and quality. This may be related to the more widespread use of stock ponds and publicity regarding use of water from streams, the legal aspects of which would have been investigated previously by the farmers and

ranchers. Over half of the respondents, however, disagreed with the statement that a farmer has the legal right to build reservoirs on any natural streams passing through his property. This may be due to the fact that whereas water laws regulate the beneficial use of water, simple impoundment of water without diversion or consumptive use is legal and requires only filing of an impoundment notice at time of construction.

2. Water Quantity. South Dakota residents felt that many counties do not receive enough moisture each year, and that increasing water use requires additional water sources. However, they indicated that South Dakota had enough lakes and were generally uncertain as to whether cloud seeding or transferring water from one part of the State to another were desirable ways to increase the supply of water.

State residents as a whole generally felt that their counties had sufficient underground water and that the water systems for their farms and communities were adequate. This would suggest that for most areas of the State residents perceive farm and community water systems to be adequate. These perceptions, however, do not preclude the fact that in some areas residents are actively developing or urging rural systems. Subsequent analysis may help identify further those areas where rural water systems are needed. Residents felt that mining of water was probably better than food rationing in attempting to meet moisture problems; however, this may be due more to the fact that they were confused as to the meaning of the term "mining" than reluctance to mine water. Residents also felt that most people were using water wisely.

There was general disagreement with the idea that the amount of water used depended upon its cost.

3. Water Quality. South Dakotans felt that the quality of their water was satisfactory. They believed

that the quality of underground water could be affected by people and that water pollution may be a problem in their area, particularly that caused by waste disposal. South Dakotans felt that penalties for water pollution were not severe enough and that stricter enforcement of the existing water pollution laws was needed. A positive attitude toward preservation of the environment existed in that approximately three-fourths of the people felt that sections of rivers still in their natural states should be left that way and that more efforts should be made to reclaim dying lakes. South Dakotans also felt that preserving streams and lakes in their natural states was more important than building reservoirs for boating and fishing.

4. Reservoirs, Dams, Flood Control and Watershed Programs. Generally, South Dakotans felt that benefits from construction of reservoirs outweigh the value of existing land use and that South Dakota could use more small dams. Furthermore, South Dakotans favored existing watershed programs and encouraged more emphasis upon watershed and flood control programs. Residents had mixed sentiments about their opportunities to share in planning watershed programs. South Dakotans, however, perceived the preservation of streams and lakes in their natural state to be more desirable than building reservoirs for recreational purposes.

5. Financing and Taxation. South Dakotans believed that flood control costs should be borne by all people in the area; however, residents were about evenly divided as to whether the costs of irrigation should be borne entirely by the irrigator. South Dakotans also felt that more tax monies should be spent to increase water areas for wildlife and that more money should be spent for studying the way water resource projects affect the environment. Residents were uncertain regarding

the cost value of a rural delivery system which would pipe water to the farms involved and whether more tax monies should be used to build additional large reservoirs in the State. South Dakotans tended to feel that payments for land purchased for water resource projects are adequate.

6. Development Benefits. South Dakotans felt that water resource development benefits all the peoples in the State and is an effective means for providing more jobs within the State. They also felt that the future of the county's growth depends largely on water conservation and that irrigation projects would be of long term benefit. South Dakotans recognized increasing water surface area would cause more problems with gnats and mosquitoes.

7. Planning of Water Reservoir Projects. South Dakotans were uncertain about the ability of technology to solve water problems and were convinced that a water problem was going to exist no matter how much planning was done. They also felt that people have little voice in the planning of water development programs. Although residents agreed that water resource projects should be planned on the state level, they felt government officials didn't pay enough attention to local water needs. South Dakotans also felt that using the State's water resources for industrial purposes was more important than use for recreational activities.

8. Willingness to Support Development Programs. South Dakotans felt that they should be more actively involved in solving or preventing local water pollution and be willing to spend more money for an improved water supply in their local areas. They also recognized a responsibility to cooperate in local flood control planning and, to some extent, encourage irrigation development in their county.

9. Water Development Policies. South Dakotans would most emphasize future development of water for domestic use and sharply lessen the emphasis on recreational

development of water resources. Residents would also support continued emphasis on the development of water resources for agricultural and industrial purposes.

Implications for South Dakota

A review of the findings and conclusions raises certain questions regarding the implications of these findings for the State of South Dakota. Some major implications are as follows.

1. The uncertainties of South Dakota residents regarding water resource use, particularly of the technical and legal aspects, suggest that additional information about water resources may be of interest to citizens. Subsequent analysis of the data may be useful in identifying target audiences for such information.

2. Programs to develop new types of rural water systems will probably meet with resistance, or at least with apathy, in those areas of the State where most of the people feel that existing water systems for their farms and communities are adequate and that mining of water would be appropriate under certain circumstances.

3. Although residents felt that their counties do not receive enough moisture each year and that increased water use will require additional water sources, plans for the development of new lakes, use of cloud seeding, or transferring water to areas of need within the state would not receive widespread acceptance as a means for solving water availability problems.

4. Varying the cost of water would not be an effective means for controlling the amount of water used.

5. Although most South Dakotans felt water quality and pressure to be satisfactory, residents are receptive to ecologically oriented measures. More strict enforcement of water pollution laws and the imposition of more severe penalties for their violation would be supported by the citizens of South Dakota.

6. Actions to maintain the natural states of rivers and lakes and to re-

claim drying lakes would receive support from the general population, even if it meant reduced construction of boating and fishing facilities in the future.

7. Plans to finance flood control projects by distributing the costs over the total population would receive public support.

8. Plans involving the total public in financing irrigation projects or constructing additional large reservoirs would receive somewhat divided support from residents of the State as a whole.

9. The expenditure of tax monies to increase water areas for wildlife and to determine the effects of water resource projects upon the environment would receive public support in this state.

10. More effective means for involving local peoples in the planning of water development programs should be established.

11. The need for planning water development programs on a statewide basis is recognized, but government officials must develop effective communication channels with the local people to achieve rapid acceptance and implementation of programs.

12. Water resource development projects would be perceived by residents of South Dakota as generally beneficial to the State as a whole and to the economic viability of the area.

13. Residents can be expected to support and advocate programs directed toward pollution control, improving local water supply, local flood control and, to some extent, irrigation development. Programs directed toward domestic use would be received very favorably.

General Summary

The attitudes of South Dakotans to aspects of water resource development were varied. Residents, however, were generally supportive of ecologically oriented water resource programs and perceived most water resource development

activities to be beneficial. They were willing to support and advocate selected development programs, especially those related to domestic use, ecological enhancement, improved water supply and local flood control.

These findings generate questions

as to how much of the variability in the attitudes of South Dakotans toward water resource development can be explained by socioeconomic status characteristics, related attitude and belief patterns and the relevant knowledge levels of the respondents. Furthermore, they raise

questions as to what kinds of trade-offs residents of the State are willing to make in order to continue development of water resources and also respect environmental considerations. These questions will be examined in part in a forthcoming second report.

References

- Diggins, Maureen, Veronica Fasbender, et al., *A Study of Sewage and Nitrate Contamination, Conductivity, and Total Hardness in Rural Water Supplies in Aurora and Brule Counties*. Yankton, S. D.: Mount Marty College, Department of Biology, November, 1974.
- Ibsen, Charles A., and John A. Ballweg, *Public Perception of Water Resource Problems*. Blacksburg, Va.; Virginia Polytechnic Institute, Water Resources Research Center, Bulletin 29, September, 1969.
- McGuinness, C. L., *Water in South Dakota*. Vermillion, S. D.: South Dakota State Geological Survey and South Dakota State Water Resources Commission, Water Resources Report No. 2, September 25, 1962.
- Mineral and Water Resources of South Dakota*. Vermillion, S. D.: South Dakota State Geological Survey, Bulletin No. 16, 1964.
- Peterson, John H., Jr., and Peggy J. Ross, *Changing Attitudes Toward Watershed Development*. State College, Miss.: Mississippi State University, Water Resources Research Institute, 1971.
- The Relationship of Water to Industry and Recreation in South Dakota*. Vermillion, S. D.: University of South Dakota, Business Research Bureau, September, 1970.
- Thompson, John, *What Recreation Means to South Dakota*. Brookings, S. D.: South Dakota State University, Cooperative Extension Service, FS111.
- Water in South Dakota for South Dakota*. Brookings, S. D.: South Dakota State University, Cooperative Extension Service, FS535.

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