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Organizational Problems of Small Watersheds

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Organizational Problems of Small Watersheds

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The University of Tennessee
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Summary

● Recent legislation (U. S. Public Law 566) has provided for Federal technical and financial aid to local groups wishing to develop flood-control and watershed-protection programs. The Tennessee District Act of 1955 authorizes local people to organize into watershed districts and gives these districts certain limited powers. Although residents in a number of Tennessee watersheds have expressed interest in watershed-development programs, relatively few have reached the stage where actual improvement measures have been adopted. In at least two watershed districts interest has apparently lagged and misunderstandings arisen.

● In 1957, experiences of three Tennessee watershed districts which have attempted to organize and operate were studied. The primary aim was to identify the major problems encountered in the initiation and operation of development programs. Landowners in the three watershed districts were interviewed. They were asked questions about their attitudes toward the local watershed program, the extent to which they understood the program, the economic costs and benefits they expected would be involved, their attitudes toward the individuals and agencies associated with the local program, and their suggestions for improving the program.

● The results indicated that landowners did not consider monetary costs and benefits alone when forming opinions about the watershed program. A landowner's attitude toward the program frequently was based on one or more of the following considerations:

1. **Degree of confidence in the individuals or agencies supporting the program:** Some landowners' attitudes reflected the fact that they did not respect the judgments of the local leaders who were supporting the watershed program or did not trust them. A few landowners apparently were against the program because they did not like the agencies which they believed were associated with the local watershed program. On the other hand, some landowners were in favor of the local watershed program largely because they had a great deal of faith in the people or the agencies which were identified with the program.
2. **A belief that the program would cause a personal monetary loss:** A few landowners in the sectors which would probably receive benefits from the watershed program thought that the money they would have to pay into the program could be invested more profitably in other

uses. Some landowners, located where dams and other structures might be located, were afraid that they would not be adequately compensated for the land which they would have to give up.

3. **A fear that individual rights might be infringed upon:** Some landowners opposed the program because they felt they might be forced to give up some of their land, to move to other locations, or to carry on specified land-use practices.
4. **A fear that some friends and neighbors would be adversely affected by the program:** Some landowners—usually located in the upper reaches of a watershed—would not have been personally affected by the program, but opposed it because their friends and neighbors might be “hurt” monetarily or be forced to give up their present land holdings. It was apparent in some instances that landowners who thought they would be “harmed” by the program actively solicited the support of other landowners in opposing the watershed program.

● Many landowners had formed attitudes for or against the program on the basis of incomplete or inaccurate information about it. Frequently they were not aware 1) that the local people would make the final decisions about watershed projects to be adopted, and 2) that individuals had the right to appeal decisions made in connection with the watershed district. It was not necessarily true that those who favored the watershed program knew more about the program than did those who opposed it; it was clear that much conflict and misunderstanding could be avoided by acquainting residents in all sectors of a watershed with the provisions of the local watershed program in the early stages of its development.

● It was apparent that the obstacles to a watershed-development and flood-prevention program were not always the same from one watershed to another. In 1 of the 3 watersheds studied, confidence in the local leadership played a very important role; in the other two watersheds the economic costs and benefits, as well as the loss of individual rights, seemed to be major concerns. This suggests the need for adapting program proposals and methods of organization to each individual watershed district.

Acknowledgment

This study was initiated because it was felt that examination of the experiences in watershed districts recently organized in Tennessee could be of help to those organizing similar districts in the future. The results reported here are based in part on a Master's degree thesis, developed by Joseph E. Winsett at the University of Tennessee.

A number of persons have given this study valuable assistance. Special appreciation is extended to:

Personnel of the U. S. Soil Conservation Service in Tennessee—particularly Messrs. J. R. Sasser, N. I. Brown, H. N. Estes, and W. R. Hurst—for their close cooperation and for providing many helpful materials related to the watershed program.

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Organizational Problems of Small Watersheds

by David W. Brown¹ and Joseph E. Winsett²

INTRODUCTION

Conservation of soil and water resources has received a great deal of attention in the past several decades. For the most part, land treatment measures that can be adopted by individual farmers and other land users—grassland farming, terraces, strip cropping, contouring, reforestation, ponds, and the like—have been emphasized in education and action programs. But many people believe that soil and water resources cannot be effectively conserved unless large-scale measures such as floodwater-retarding dams and stream channel improvement are also undertaken. These measures are usually too expensive for a single landowner to finance, and involve the cooperation of all landowners whose properties are affected by the projects.

The Federal government and most state governments have acted in recent years to help local people solve their erosion-control, water-conservation, and flood-prevention problems cooperatively. Since the 1930's the Tennessee Valley Authority, cooperating with local, state, and other Federal agencies, has stimulated research and small watershed developments through comprehensive research and demonstration projects. The most recent step has been U. S. Public Law 566, "The Watershed Protection and Flood Prevention Act." This Act authorizes Federal financial and technical assistance to local groups which are organized for watershed protection and flood control. Many states, Tennessee included, have enacted legislation which enables local people in a watershed to organize and take action needed to utilize this Federal assistance.

The efforts of residents in two watersheds of Tennessee to organize and initiate projects have not been very successful. Even though proposed watershed-protection and flood-prevention mea-

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tures would pay large dividends for at least some landowners in these watersheds, apparently other less tangible factors have caused these local programs to bog down.

This study is an attempt to diagnose the experiences in three of these watershed districts in the hope that the findings may be helpful to local people who desire to organize watershed programs in the future.



Gullies, such as these on Sand Creek Watershed in Fayette County, are the source of large quantities of sand and silt which is deposited downstream as damaging sediment. Usual treatment of such gullies is to plant pine seedlings and protect them from fire and grazing.

Legislation for Establishing the Small Watershed

Both the Federal government and the State of Tennessee have set up the legal machinery necessary for people in Tennessee watersheds to organize for the purpose of tackling their watershed-management and flood-prevention problems.

Federal Legislation

The "Watershed Protection and Flood Prevention Act" (U. S. Public Law 566), passed by Congress in 1954, authorizes the U. S.

Department of Agriculture to provide local groups with technical and financial assistance in planning and developing works of improvement for flood-prevention and water-management purposes. Under the provisions of the act, local watershed groups may request the Soil Conservation Service to help them develop work plans for combatting their watershed-management problems. Special work parties, composed of agricultural and engineering technicians, survey these watersheds to assess the flooding and watershed protection problems which exist. Working closely with representatives of the local landowners, the technicians develop plans for structures and measures, and estimate the costs and returns associated with these projects. However, the local people, acting through their elected boards of directors, make the final decision as to what projects, if any, are to be adopted.

Once the local landowners and the federal government agree upon a specific plan, the Federal government is authorized to pay the construction costs of flood-prevention dams and other structures related to agricultural watershed management. However, Public Law 566 provides that landowners in the local watershed districts provide any land easements or rights-of-way needed. The local people or local governments pay construction costs of any projects specifically related to nonagricultural water use (such as urban water supply or recreational facilities). In addition, the local people are required to maintain any works of improvement after they have been constructed. To insure more effective flood prevention and watershed protection, watershed districts which receive Federal help are required to see to it that recommended soil conservation practices are carried out on at least half of the land in the watershed above the retention structures.

The Watershed Protection and Flood Prevention Act places certain limitations on the size of the watersheds receiving Federal aid, as well as on the size of structures built. This is to keep the program adapted to the desires of the local people and to avoid overlapping with Federal programs which deal with large river basins. To be eligible for Federal assistance, watersheds must contain less than 250,000 acres. However, it is possible in some cases for watershed districts located next to one another to combine. Unless special action is taken, a single structure must have a flood water detention capacity of less than 5,000 acre-feet or a capacity of less than 25,000 acre-feet for all purposes.¹

¹Further details of U. S. Public Law 566 are outlined in: "Facts About the Watershed Protection and Flood Prevention Act," PA 298, U. S. Department of Agriculture, Soil Conservation Service, Washington, D. C., January 1957.

State Legislation

In 1955 the Tennessee General Assembly passed an Act which authorized local landowners to organize into watershed districts to make use of Federal assistance under the provisions of U. S. Public Law 566.² Under the Tennessee Watershed District Act, landowners in a watershed area which meets certain specifications may apply to the Tennessee Secretary of State for authorization to organize a district. A watershed district so recognized by the State of Tennessee is granted limited powers which are aimed at helping people in the district study and solve their flooding and water-conservation problems cooperatively. Among other things, a watershed district can:

1. Decide how available funds will be used in flood prevention and water management programs.
2. Request assessments through the county courts to pay for structure sites and the maintenance of structures.
3. Arrange to issue bonds and borrow money needed to finance the district program.
4. Exercise the power of eminent domain so that sites for dams and other works of improvement may be acquired where needed.

The Tennessee enabling act gives local landowners the final "say" in deciding whether a watershed district is to be formed and, if so, what flood-prevention and watershed-protection measures are to be undertaken. Provisions are made for the landowners to elect a board of directors to act in their behalf with regard to the watershed program. Further provisions of the act enable individuals who are not satisfied with decisions made by the district to appeal through regular court channels. Under the act, the general steps for organizing a watershed district are as follows:

1. At least one-fifth of the landowners in the watershed, representing at least 25 percent of the land area in the watershed, file a petition with the Tennessee Secretary of State to request a charter of incorporation. Included in the petition are the names of 5 to 9 landowners in the watershed, who will compose the temporary board of directors.
2. If the petition is approved by the Secretary of State, the temporary board of directors calls a referendum to determine whether the landowners want to organize a watershed district.

²J. I. Bell. Watershed District Act of 1955, Public Chapter No. 112, House Bill No. 708, Tennessee Public Acts of 1955.

The provisions of watershed-development legislation in Tennessee and other states are outlined and compared in:

- (a) Robert C. Otte, "Local Resource Protection and Development Districts," **ARS 43-48**, Agricultural Research Service, U. S. Department of Agriculture, April 1957.
- (b) K. M. Sandals and L. M. Adams, "Progress in State Legislation Relating to the Watershed Protection and Flood Prevention Act, 1955-1957," **SCS-TP-135**, Soil Conservation Service, U. S. Department of Agriculture, January 1958.

3. If the majority of those voting approves the formation of a district, the Secretary of State issues the district a charter of incorporation.
4. The temporary board of directors establishes the exact boundaries of the watershed district.
5. Within 30 days after the boundaries have been established and approved, an election is held to choose a permanent board of directors. Each director ordinarily serves for six years. Termination dates are staggered. These directors are responsible for guiding the local watershed program and, as representatives of the people, decide what projects are to be adopted, and apply for any Federal assistance that may be needed.
6. Before any construction begins, a complete plan is filed with the county court of the county containing the largest portion of the watershed. A public hearing is held at which the court appraises the project proposals and recommends a method for financing the local share of project costs.

Progress in Organizing Small Watershed Districts

Since U. S. Public Law 566 was passed in 1954, a number of watershed groups in Tennessee have taken initial steps to organize for watershed-protection and flood-prevention purposes. By the middle of 1958 landowners in some 15 to 20 watersheds had expressed informal interest in obtaining Federal assistance in studying their flooding and water-conservation problems. Of these, eight watersheds had taken the steps to be recognized by the State as organized districts and had elected permanent boards of directors. The Soil Conservation Service had completed detailed engineering surveys in seven watersheds. (One of these had not yet been formally organized as a district.) Four watershed districts had received Federal approval of their plans for watershed protection and flood prevention and had begun improvement projects.

Thus, it can be observed that, although landowners in a number of small watersheds of Tennessee have expressed interest in developing programs, only a few have reached the stage where they can actually get their programs underway. In some instances the watershed districts have been organized fairly recently and have not had time to develop their programs. Landowners in other districts seem to have lost interest in pursuing the idea further, or strong opposition groups have arisen. In one watershed, landowners have voted against forming a watershed district, even though much interest had been shown earlier. In another watershed, landowners voted to form a district and elected a permanent board of directors, but later failed to take further action. This loss of interest occurred after the Soil Conservation Service had spent



1. Swan Creek Watershed 2. White Oak Creek Watershed 3. Johnson Creek Watershed

Figure 1. Location of the watersheds include in the survey.

thousands of dollars in engineering surveys and estimates, not to mention the time and expense contributed by many interested local people.

Purpose of This Study

This study was initiated for two purposes: 1) to review the problems encountered in organizing small watershed districts, and 2) to indicate the means whereby landowners might more effectively organize to assess their flooding and water-management problems and develop watershed projects to meet their needs.

Method and Scope of the Study

It was felt that the most effective way to learn why the watershed program was not accepted by some residents was to contact local people directly. In the summer of 1957 landowners were interviewed in three watersheds where attempts had been made to organize districts. These three watersheds were White Oak Creek, Swan Creek, and Johnson Creek (figure 1). These watersheds were selected because 1) they had been among the earliest in Tennessee to express interest in organizing watershed development programs, and 2) they had made varying degrees of progress in developing programs.

A stratified random sample was selected from a list of all the landowners in each of the three watersheds. The sample was based on landowners, rather than all the people actually using the land or living within the watershed boundaries, because the landowners were by law the ones who made the decisions about developing local watershed programs.

Within each watershed the sample was stratified according to locations of landowners' tracts of land. That is, each watershed was divided into what roughly correspond to areas above and below the probable sites of retention structures, and the sample was prorated between those areas according to the total number of landowners in each. In White Oak Creek, which was considerably larger than the other two, the sample was also stratified by major sub-watershed areas within the overall watershed. This made certain that the landowners interviewed would represent the major water-management problems and neighborhood environments in any one watershed. A total of 184 landowners were interviewed—82 in White Oak Creek, 51 in Swan Creek, and 51 in Johnson Creek.

Questions included in the survey covered the following areas:

1. The landowner's attitude toward the organization of a watershed program in his locality.
2. The extent to which the landowner understood the intent, provisions, and present local status of the local watershed program.
3. The landowner's attitude toward local leaders associated with the watershed program.
4. The landowner's attitude toward public agricultural agencies directly or indirectly related to the watershed program—namely, the Soil Conservation Service, the Extension Service, and the Vocational Agriculture Program.
5. The landowner's attitude toward Federal participation in local watershed-protection and flood-control activities.
6. The frequency and extent of flood damage taking place on the landowner's property.
7. The costs which the landowner thought he would have to contribute to the program, and the benefits which he expected to receive.
8. The landowner's criticisms of the watershed program and his suggestions for improvements in both legislative provisions and local organizational procedures.

Description of Three Watersheds

White Oak Creek. The White Oak Creek watershed, located in parts of Henderson, Hardin, McNairy, and Chester counties in West Tennessee, as previously stated, is the largest of the three watershed districts studied; it is an area of 125,000 acres. There are about 1,200 landowners in the watershed. Most of the watershed is in farms, although it does contain several small communities. More than half of the farm land is in pasture and trees, while the remaining acreage is used for hay, corn, cotton, soybeans, and others crops. In 1954 the average farm contained 103 acres, of which 46 acres were cropland.³

The White Oak Creek watershed has some rather severe flooding, erosion, drainage, and sedimentation problems. Most of the bottom soils—composing about one-fourth of the total watershed area—are poorly drained and flooding is common on many broad expanses in the lower parts, particularly in the winter and early spring months. The sand and silt washed down from the easily eroded upland soils are frequently deposited on productive bottomland when the main streams overflow. In former years canals have been constructed and main channels have been deepened to

³Based on minor civil district data from the U. S. Census of Agriculture, U. S. Bureau of the Census, Washington, D.C., 1954.

remove excess water. However, soil deposits from upper parts of the watershed have frequently made these measures ineffective after short periods of time. In White Oak Creek the amount of land flooded on individual ownership tracts ranged from 1 to 50 acres, and averaged 22 acres.

Although landowners in White Oak Creek were among the earliest to become interested in organizing for flood prevention and watershed protection under Public Law 566, interest apparently lagged, and a watershed work plan was not developed. Interested landowners and other local leaders met to discuss possibilities for organizing a watershed district in the spring of 1954. Several meetings to explain the program were held and the Soil Conservation Service made a preliminary survey of flooding problems and possible solutions. In a public referendum, held in August 1956, landowners approved the organization of a watershed district by a vote of 447 to 245. A permanent board of directors was elected in October 1956. Since then mixed reactions have been expressed concerning a watershed protection program and no further action has been formally taken to complete a work plan.

Swan Creek. The Swan Creek watershed is located in Lincoln and Marshall counties in the southern part of Middle Tennessee. It contains 32,000 acres of which about half is in farms. There are about 270 landowners within the boundaries of the watershed. More than two-thirds of the farm land is in pasture and trees. The remaining farm acreage is devoted to hay, corn, small grains, and other crops. In 1954 the average farm had 111 acres; 28 acres of this was in cropland.⁴

A relatively small portion of Swan Creek—less than 10 percent—is composed of bottomlands subject to flooding. However, water runoff from the upland soils is rapid. When heavy rains do occur—especially in the winter and early spring months—Swan Creek and its tributaries frequently overflow and a considerable amount of scouring occurs on the tracts adjacent to the main streams. The land flooded per ownership tract ranged from 1 to 64 acres, and averaged 24 acres.

In the fall of 1954 an organizational meeting was held in Swan Creek and a temporary board of directors elected. An engineering survey was conducted by the Soil Conservation Service to evaluate flooding problems and suggest possible measures to reduce flood damage. At the same time several meetings were held to inform

⁴U. S. Census of Agriculture, 1954.

the local people about the objectives and provisions of the watershed program. But in March 1957, the landowners voted 115 to 84 against forming a watershed district. Since then no further action has formally been taken.

Johnson Creek. The Johnson Creek watershed is located in Madison County in West Tennessee. It is the smallest of the three watersheds included in this study, with 22,600 acres. There are about 230 landowners in the watershed. Most of the land in the watershed is in farms. No large communities are situated within its boundaries. However, the airport which serves nearby Jackson is located in the lower portion of the watershed. Johnson Creek watershed is more intensively cropped than are the other two watersheds in the study. Pasture and woodland accounts for only about two-fifths of all the farm land. The remaining acreage is largely in cotton and corn, with some being devoted to hay, small grain, and other crops. In 1954 the average farm in Johnson Creek contained 77 acres, of which about 49 acres were in crops.⁵ Leasing and sharecropping arrangements are much more common in Johnson Creek than in White Oak or Swan Creeks.

Landowners in Johnson Creek watershed face severe flooding, erosion, and siltation problems. Much of the upland area is easily eroded and is not protected by vegetative cover. This has resulted in severe gullying and sheet erosion, and much sand and silt have been deposited on the bottoms. Landowners had from 2 to 500 acres of their land flooded, or an average of 60 acres per ownership tract.

The watershed protection program in Johnson Creek has advanced further than in the other two watersheds. The first exploratory meeting was held in June 1954. In August 1955, after a series of educational meetings, local landowners decided to form a watershed district by a decisive vote of 85 to 8. A permanent board of directors was elected in December 1955. Since then engineering surveys have been completed and a watershed work plan agreed upon. The plan includes land-treatment measures, floodwater-retarding structures, and channel improvements. Comprehensive efforts have been made to encourage individual landowners to plant trees and sod crops on the steeper, easily eroded land of the watershed. Representatives of the various public agricultural agencies and local organizations have worked very closely together to stimulate the interest of the residents in watershed development in Johnson Creek.

⁵U. S. Census of Agriculture, 1954.

Attitudes of Landowners Toward the Watershed Program

While the results were by no means conclusive, the survey provided many insights into landowners' attitudes toward the watershed program, their knowledge about the program, and the things they considered when forming opinions about it. Since landowners in only three watersheds were included in the survey, it is not necessarily true that the findings shown here indicate



Local leaders must function in watershed development. Here supervisors of the Greene County Soil Conservation District and directors of the Lick Creek Watershed District review together the proposed work plan for their watershed.

what has happened in all Tennessee watersheds organized under Public Law 566. Similarly, where certain factors were related to attitudes toward the watershed program, it is not necessarily true that these factors were causes of attitudes toward the program. In fact, just the reverse may sometimes have been the case; that is, some landowners' attitudes toward the agencies and people concerned with the program and their knowledge about the program may have come about as a result of initial attitudes formed toward the program.

Landowners' replies about how they felt toward the organization of a local watershed protection district rather closely paralleled the outcomes of the referendums which have been held in each of the three watersheds. In Swan Creek, where it had been decided not to organize a district, a slight majority was opposed to the watershed program (table 1). No landowner in Swan Creek expressed a neutral attitude toward the program. Yet it was apparent to the interviewers that some landowners in this water-

Table 1. Attitudes of Landowners Interviewed Toward the Organization of a Watershed Development Program in Their Locality—Tennessee, 1957.

Item	Landowners in:					
	White Oak Creek Watershed		Swan Creek Watershed		Johnson Creek Watershed	
	No.	%	No.	%	No.	%
In favor of the program	47	57	25	49	38	74
Neutral about the program	11	14	0	0	9	18
Against the program	24	29	26	51	4	8
Total	82	100	51	100	51	100

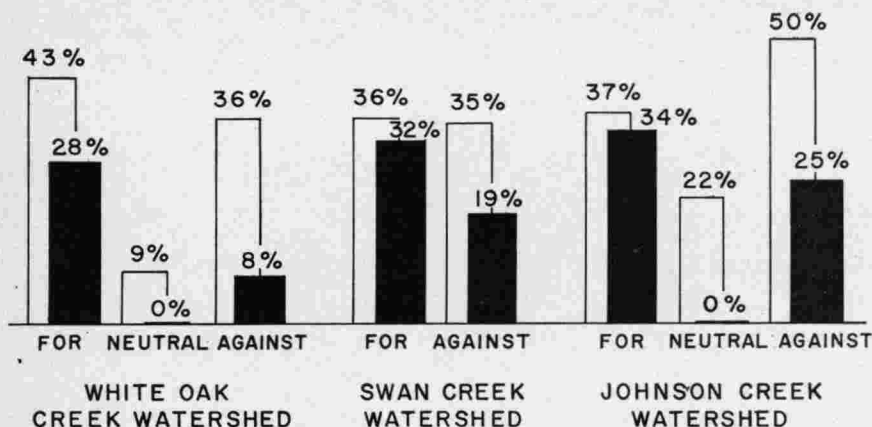
shed did not have strong feelings for or against the program. In White Oak Creek a majority was in favor of the watershed program even though action on the program had apparently been discontinued at the time of the survey. In Johnson Creek only 4 of the 51 landowners surveyed were opposed to the watershed program. This is in agreement with the conclusive majority which had approved the watershed district organization in the referendum held earlier.

Reasons for Differences in Attitudes

There seemed to be three major reasons for the differences in attitudes of landowners toward the watershed program. First, the landowners were influenced by the monetary gains or losses which they expected to have as a result of being in an organized watershed district. Second, they were influenced by their knowledge of the watershed program. Third, they were influenced by the local leadership in the area.

Expected Monetary Gains or Losses: More of the landowners included in the survey who were in favor of the watershed program had flood damage on their land than did those who opposed the program (figure 2). Landowners were asked whether they thought they would be required to help pay local costs of a watershed development program if one were adopted. Actually no final decisions had been made in any of the three watersheds at the time of the survey. But rumors had been circulating about the projects to be selected and who would bear the costs, and in Johnson Creek concrete program proposals had been made.

There seemed to be no conclusive relationship between landowners' attitudes toward the watershed program and the proportions of landowners who believed they would have to help pay for



□ Percent of landowners with land flooded ■ Percent of landowners with damage from flooding

Figure 2. Proportion of landowners with land flooded and with damage from flooding at least once every 5 years.

flood protection measures (table 2).⁶ One-half of the landowners in White Oak Creek believed they would be taxed for the watershed program, while only about one-tenth (five) of the landowners

⁶This conclusion is based on subjective inspection since there were too few observations in some categories to allow the Chi-square test.

Table 2. Landowners' Opinions as to Whether They Would Have to Help Pay for Watershed Projects, Tennessee, 1957.

Item	Attitude Toward the Watershed Program			
	For	Neutral	Against	All
	— Number of landowners —			
White Oak Creek Watershed				
Believed they would have to pay	31	2	8	41
Did not know	12	6	12	30
Believed they would not have to pay	4	3	4	11
Swan Creek Watershed				
Believed they would have to pay	9		8	17
Did not know	6		12	18
Believed they would not have to pay	10		6	16
Johnson Creek Watershed				
Believed they would have to pay	4	0	1	5
Did not know	18	7	1	26
Believed they would not have to pay	16	2	2	20

in Johnson Creek felt they would have to contribute. This may partly explain the greater acceptance of the watershed program in Johnson Creek. A sizable proportion of the landowners in every watershed did not know whether or not they would have to help pay for the watershed development projects.

The money returns which landowners expected to receive from their contributions to the watershed program seemed to affect their attitudes toward the program.

Landowners who thought they would be taxed were asked whether they expected to gain more money returns from the program than they would have to pay into it over an extended period of time. In White Oak and Johnson creeks most landowners believed they would gain more than they contributed, while in Swan Creek more than half thought they would not receive as much (table 3). In all three watersheds more of the landowners who were against the watershed program thought they would not gain as much as they paid than did those who were in favor of the

Table 3. Landowners' Opinions as to Whether They Would Gain More Than They Would Have to Pay into Local Watershed Projects, Tennessee, 1957^a.

Item	Attitude Toward the Watershed Program			
	For	Neutral	Against	All
— Number of landowners —				
White Oak Creek Watershed				
Believed they would gain more than they paid	28	1	0	29
Did not know	2	1	0	3
Believed they would not gain as much as they paid	1	0	8	9
Swan Creek Watershed				
Believed they would gain more than they paid	4		0	4
Did not know	4		1	5
Believed they would not gain as much as they paid	1		7	8
Johnson Creek Watershed				
Believed they would gain more than they paid	4	0	0	4
Did not know	0	0	0	0
Believed they would not gain as much as they paid	0	0	1	1

^aIncludes only those landowners who believed they would be required to contribute to local costs of the watershed program.

program.⁷ There were too few responses in Swan and Johnson creeks to allow an indication of what, if any, relationships existed.

Even though a landowner might get back at least one dollar added returns for each dollar he paid into the watershed program, it still may not be profitable for him to contribute to the program. It may be that the landowner's money could bring a greater return if invested in another use—equipment, livestock, fertilizer, etc. Thus, the returns that a landowner expects to earn on alternative investments could be expected to influence his attitude toward the watershed program.

To get at this, landowners who thought they would be taxed for the watershed program were also asked whether they believed they could use the funds for another purpose and receive greater returns. As shown in Table 4, most of these landowners thought they would receive higher returns from investments in the watershed program than from other uses of their capital. In White Oak Creek those who were in favor of the watershed program tended to

⁷This conclusion is based on subjective inspection since there were too few observations in some categories to allow the Chi-square test.



Benefits from watershed works of improvement come largely from the reduction of damages. Here pictured from the air in 1958 is floodwaters of the Lick Creek Watershed spread from hill to hill.

Table 4. Landowners' Opinions as to Whether Money They Invested in Watershed Projects Would Earn Greater Returns in Other Uses, Tennessee, 1957^a.

Item	Attitude Toward the Watershed Program			
	For	Neutral	Against	All
	— Number of landowners —			
White Oak Creek Watershed				
Believed money could be used more profitably elsewhere	1	0	7	8
Did not know	4	1	1	6
Believed money could not be used more profitably elsewhere	26	1	0	27
Swan Creek Watershed				
Believed money could be used more profitably elsewhere	2		0	2
Did not know	4		7	11
Believed money could not be used more profitably elsewhere	3		1	4
Johnson Creek Watershed				
Believed money could be used more profitably elsewhere	0	0	0	0
Did not know	1	0	1	2
Believed money could not be used more profitably elsewhere	3	0	0	3

^aIncludes only those landowners who believed they would be required to contribute to local costs of the watershed program.

regard investments in the watershed program as more profitable than other alternatives, while those who were against the program tended to believe other investments would yield larger returns.⁸ Similar relationships were indicated in Swan and Johnson creeks, but there were too few observations to allow meaningful interpretations.

Considerable caution should be observed when interpreting the landowners' beliefs about the returns and costs associated with the watershed program. No definite projects had been approved and no financing schemes had been adopted at the time of the survey. Many landowners could not, or were not willing, to express opinions about returns relative to what they would contribute. Landowners who did respond to the questions based their answers on very scanty, and sometimes inaccurate, information. Yet it is each

⁸The Chi-square test was not used to test the significance of this relationship because there were too few observations in some categories.

landowner's understanding of the costs and returns to be involved—not necessarily the true facts about costs and returns—that is likely to serve as a basis for forming his attitude toward the watershed program.

Apparently much opposition to the watershed program arose from individual landowners' fears that they or their neighbors would be forced to sell part of their land to the district for dam sites and rights-of-way and would not be compensated adequately for this land.

Landowners were asked whether they thought some of their land would be condemned by the watershed district for dam sites or flooded areas if the watershed program was initiated. In all three watersheds most landowners thought they would not be asked to sell their land to the district (table 5). Those who believed their

Table 5. Landowners' Opinions as to Whether Some of Their Land Would Be Taken for Watershed Projects, Tennessee, 1957.

Item	Attitude Toward the Watershed Program			
	For	Neutral	Against	All
— Number of landowners —				
White Oak Creek Watershed				
Believed some of their land would be condemned	2	0	8	10
Did not know	1	2	4	7
Believed none of their land would be condemned	44	9	12	65
Swan Creek Watershed				
Believed some of their land would be condemned	0		9	9
Did not know	4		3	7
Believed none of their land would be condemned	21		14	35
Johnson Creek Watershed				
Believed some of their land would be condemned	2	0	0	2
Did not know	8	7	1	16
Believed none of their land would be condemned	28	2	3	33

land would be condemned were frequently located in the upper extremes of the flood plains of the main stream and their tributaries, below the upper reaches of each watershed. There was a



Structures, such as this newly-completed one on Sand Creek Watershed in Fayette County, hold back floodwater and gradually release it so as to prevent or reduce flooding below.

slight tendency for those who thought they would be required to give up some of their land to be opposed to the watershed program. However, this relationship was not statistically significant.

Several landowners expressed concern that they would not be adequately paid for any land condemned by the district. These landowners observed that their best bottomland was likely to be taken for dam sites and rights-of-way. This would leave them with only less productive upland fields and would be likely to force them to make major adjustments in their farming systems. The landowners felt that, even if they received full market rates for the land they had to give up, they would suffer financial loss by having to farm fewer, less productive acreages. For example, a dairy farmer who had been raising grain and forage on his bottomland fields felt it would be unprofitable to continue in dairying if most of this bottomland were taken for flood-control purposes. This would leave him with an investment in a milking parlor, silos, and dairy equipment that could not be readily used for other enterprises. It was argued by some landowners, therefore, that the watershed directors should consider the income effects on the entire farm businesses when deciding how much to pay landowners for condemned land.

Asked how they would adjust their farming programs if some of their land were taken for the watershed program, most landowners in all three watersheds thought they would continue to farm their remaining acreages. A few indicated that they would try to buy or rent additional land to provide a scale of operation that would allow them to support their families. But in many cases landowners thought it would be very difficult to buy or rent additional lands near their present locations. A very few landowners indicated that, if their best bottomland was condemned, they would try to locate on farms elsewhere. However, many expressed strong family attachments to their present farms and neighborhoods, and were unwilling, or very reluctant, to move to other places. The fact that many of the landowners in the three watersheds were more than 50 years old⁹ further explains this reluctance to give up their present locations. A few landowners indicated that they would give up farming altogether if their land was acquired by the watershed district.

It was apparent that many landowners opposed the watershed program because they were afraid their neighbors and friends might be forced to give up land and face financial loss, even though they themselves did not expect to be affected by the program. In several instances the landowners who thought their land would be taken had actively tried to influence their neighbors to vote against the formation of a watershed district. In other cases landowners had developed this concern for their neighbors "on their own." This suggests the important effect that close neighborhood bonds can have on the attitudes of entire groups of landowners toward the watershed program.

Knowledge about the Watershed Program. In the preliminary investigation which was made when this study was initiated, a number of local leaders and agricultural workers said that landowners would not support the watershed program unless they had a complete and accurate understanding of its provisions. To test this idea, landowners were asked questions designed to reveal their levels of understanding about the watershed program. The results were then related to the landowners' attitudes toward the watershed program.

Responses to the "knowledge" questions were coded so that each correct answer received a value of 1 and each wrong answer received a value of 0. These values were combined into a "know-

⁹The average landowner interviewed was 55 years old in White Oak Creek; 50 years old in Swan Creek; and 47 years old in Johnson Creek.

ledge score" for each landowner to provide an indication of his general level of understanding about the watershed program. Twenty-one questions were included in the final score. Each question received the same weight, since there was no logical basis for believing one was more important than another. A landowner could, as a result, receive a score as high as 21 or as low as 0. The questions which were included in the final score covered five general aspects of the watershed program:

1. Objectives of the watershed program (1 question).
2. Methods of making decisions related to the various phases of the local watershed program (6 questions): How district directors are chosen, who selects improvement measures and their location, etc.
3. Sources of financing various parts of the program (5 questions): Who pays for construction costs, who provides sites for dams, how funds are raised, etc.
4. Legal rights of the landowners (8 questions): What amount of taxation is allowed, what rights of appeal do local landowners have, etc.
5. Status of the local watershed program at the time of the survey (1 question).

In all three watersheds, relatively few landowners were well acquainted with the provisions and status of the watershed program. The average landowners in White Oak Creek and Swan Creek had scores of 9.6 and 9.2 respectively (out of a possible score of 21). The average landowner in Johnson Creek had a somewhat lower knowledge score of 6.5.

Average knowledge scores of landowners "for," "neutral," and "against" the watershed program in each of the three watersheds are shown in Figure 3. In White Oak Creek landowners who were in favor of the watershed program knew more about the program than those who were neutral or opposed to the program.¹⁰ In Swan Creek, landowners who were for the watershed program did not know significantly more or less about the program than did those who were against it. In Johnson Creek those who were against the program actually had higher knowledge scores than did those who were in favor of or indifferent to it.¹¹

These results suggest no consistent relationship between landowners' attitudes toward the watershed program and their knowledge about it. It may be that some landowners who have strong

¹⁰According to the "F test," differences in knowledge among landowners "for," "neutral," and "against" the program were significant at the 95-percent level. That is, the odds are 95 out of 100 that real differences in knowledge existed among the three attitude groups.

¹¹According to the "F test," differences in knowledge among landowners "for," "neutral," and "against" the program were significant at the 90-percent level in Johnson Creek.

feelings for or against the watershed program made a special effort to learn more about its provisions. Apparently, other considerations were as important, if not more so, in forming landowners' opinions about the program.¹²

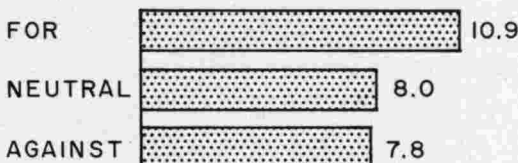
Landowners were relatively well acquainted with some aspects of the watershed program and yet knew rather little about other aspects. It was apparent that some landowners had acquired inaccurate information about the program. Table 6 shows the average percentages of correct answers given by landowners in the three watersheds to each of five groups of "knowledge" questions.

Nearly everyone was able to answer the question dealing with the general objective of the watershed program. It may be that

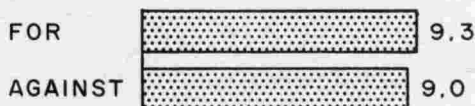
¹²Further details of the relationships between knowledge about the program and attitudes toward the program are presented in the Appendix.

AVERAGE KNOWLEDGE SCORE^a

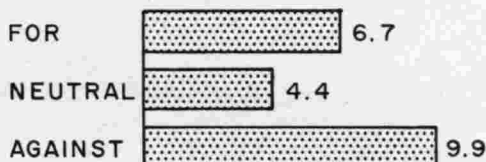
White Oak Creek Watershed



Swan Creek Watershed



Johnson Creek Watershed



^aThe higher the score, the greater the understanding of the watershed program.

Figure 3. Relationship of landowner's knowledge about the watershed program to their attitudes toward the watershed program.

Table 6. Average Percentages of Correct Responses to Questions Dealing with Understanding of the Watershed Program, Tennessee, 1957.

Subject covered by questions	Number of questions	Average percent correct answers		
		White Oak Creek Watershed	Swan Creek Watershed	Johnson Creek Watershed
Objectives of the program	1	98	94	100
Methods of making decisions related to the program	6	37	37	20
Sources of financing various parts of the program	5	52	46	35
Legal rights of the landowners	8	40	38	30
Present status of the local program	1	65	65	12

the correct answer to this question was fairly obvious, so perhaps not a whole lot of confidence should be placed in this response as an indicator of how well landowners understood the general objectives of the program.

Relatively few landowners in any of the watersheds fully understood how decisions related to the organization of the district and the selection of improvement measures were made. For example, many thought incorrectly that final decisions about dams to be constructed and their locations were made by the Federal government rather than by the local people. Others were not aware that the local people had a part in selecting the watershed board of directors.

Many landowners did not know or had inaccurate ideas about how the watershed improvement projects were to be financed. Some thought that every landowner in the watershed, regardless of whether or not he benefited from the program, would have to help pay local costs. Many were not aware that limitations were placed on the amount a landowner could be taxed.

Relatively few landowners were well acquainted with their legal rights concerning the watershed program. Many were unaware that through the court systems they could appeal decisions made by the watershed board of directors.

Landowners were asked to indicate their major sources of information about the watershed program (table 7). In all three watersheds, especially in White Oak and Swan creeks, information was most frequently obtained through informal contact with other local people—neighbors, friends, relatives, and business people. Several landowners in a single neighborhood would often mention

Table 7. Major Sources of Information about the Watershed Program, Tennessee, 1957^a.

Source of information	White Oak Creek Watershed				Swan Creek Watershed			Johnson Creek Watershed			
	"For"	"Neutral"	"Against"	All	"For"	"Against"	All	"For"	"Neutral"	"Against"	All
	— Number of landowners —										
Local people	31	11	21	63	17	22	39	15	9	1	25
Special watershed meetings	19	1	8	28	9	11	20	8	0	1	9
SCS workers	8	0	1	9	1	0	1	15	0	3	18
Publications (pamphlets, newspapers, etc.)	1	0	0	1	1	4	5	5	1	2	8
Watershed district board members	3	0	1	4	3	1	4	5	0	0	5
County agents	0	0	0	0	2	0	2	3	0	0	3

^aThe total number for any one attitude group adds to more than the number of landowners interviewed because some landowners reported receiving information from more than one major source.

the same individual, usually a person who had previously gained respect as being well-informed on local affairs. This suggests the importance of providing these informal leaders with accurate and complete information about the watershed program before misimpressions have been conveyed and attitudes toward the program have become fixed.

In a few instances landowners consulted their lawyers about the merits and features of the program. A fairly large number of landowners, though still a minority, had attended one or more special meetings held in various parts of each watershed to explain the program. Many landowners in Johnson Creek credited Soil Conservation Service personnel as being a major source of information about the watershed program. Not many landowners had obtained information about the program directly from county agents. Similarly, only a few landowners reported receiving information about the program through mass media—special pamphlets, newspapers, radio, and the like.

Every landowner said that he had learned about the program from one source or another. Many had received information from two or more sources. But in many instances landowners had learned little more than the fact that there had been "talk" about organizing some sort of a flood-control program.

There seemed to be no consistent relationship between landowners' attitudes toward the watershed program and their sources of information about the program. That is, those "for," "neutral," and "against" the program all drew heavily on neighbors and other informal leaders for information and less frequently on mass media, special meetings, and technical workers.

Influence of Local Leadership. Although local leaders and public agency personnel were major sources of information about the watershed program, it did not necessarily follow that landowners thought their attitudes toward the program were influenced by these people. Landowners were asked whether their opinions about the program had been influenced by other individuals or groups of people. As indicated in Table 8, very few landowners in any of the watersheds felt that their attitudes had been influenced by others. Those who had been influenced by others usually mentioned neighbors or members of the watershed board of directors as having exerted this influence. Those who supported the program did not seem to be influenced by others much more or less than those who were neutral or against the program.

Table 8. Influence of Other People on Landowners' Attitudes Toward the Watershed Program, Tennessee, 1957

Item	Total number of landowners' interviewed	Percent of landowners:		
		Influenced by others	Not influenced by others	Giving no answer ^a
White Oak Creek Watershed				
Landowners "for" the program	47	2	98	0
"Neutral" landowners	11	0	91	9
Landowners "against" program	24	4	92	4
All landowners	82	2	96	2
Swan Creek Watershed				
Landowners "for" the program	25	12	84	4
Landowners "against" program	26	4	77	19
All landowners	51	8	80	12
Johnson Creek Watershed				
Landowners "for" the program	38	5	82	13
"Neutral" landowners	9	0	44	56
Landowners "against" program	4	0	100	0
All landowners	51	4	76	20

^aThese landowners did not know or were not willing to indicate whether their attitudes had been influenced by other people.

The influence of other people in forming attitudes toward the watershed program may have been more important than the landowners themselves realized. In some instances landowners may have felt that they had objectively weighed the evidence in their own minds, even though their conclusions reflected the expressed attitudes of their neighbors and friends. In other cases the information received from other people may have appeared to be accurate and objective to the landowner but may, in fact, have been biased or "colored" by these other persons. This again suggests the importance of making certain that information about the program is as accurate and as complete as possible from the start.

Preliminary investigation suggested that in many instances landowners' personal feelings toward local people involved in organizing the watershed program may have had a strong influence on their attitudes toward the program. It was felt that a landowner may decide to vote against the watershed program largely because he does not like or has little confidence in one of the persons actively supporting the program. Another landowner may be

favorably inclined toward the program, even though he knows little about it or will not gain financially from it, primarily because a person in whom he has confidence says the program is "good."

Landowners were asked several multiple-choice questions aimed at providing an indication of their confidence in the local leadership associated with the watershed program.

Responses to four of these questions were used to derive an index of landowners' overall attitudes toward the program leadership. These questions were:

1. Would you say that some people are attempting to form the watershed mostly for their own gain regardless of others?
2. Do you think that some things have been going on that most people don't know about?
3. Do you think that some people in this watershed are trying to run things and keep others out?
4. Would you say that you have not been told about what's been going on as much as some other people have been told?

While these questions do not ask directly the opinions held by landowners for individuals, it was felt that the responses given would reflect their general attitudes toward local leadership.

Responses to each questions were divided into three groups and coded as follows:

- Answer indicating favorable attitude toward leadership2 points
- Answer indicating neutral attitude toward leadership1 point
- Answer indicating unfavorable attitude toward leadership0 points

The values corresponding to responses for each of the four questions were added together to form the final "attitude score." A landowner whose replies to all four questions were favorable toward local leadership received a score of 8; a landowner who gave "negative" replies to all four questions received a score of 0. Landowners who indicated greatest trust in the leadership associated with the watershed program tended to be those who were favorable toward it (figure 4). Conversely, landowners who were against the watershed program had less trust in its leaders.¹³ Several landowners—located mostly in the upper parts of White Oak and Swan creeks—felt that the leadership represented mainly the interests of the landowners in the lower parts of the watersheds who were trying to "put something over" on the other landowners in an effort to

¹³According to the "F test" these relationships were significant at the 99 percent level in all three watersheds. That is, chances are 99 out of 100 that among all of the landowners in the three watersheds there were real differences in attitudes toward local leadership among landowners "for," "neutral," and "against" the program.

SCORE INDICATING ATTITUDE^a TOWARD LOCAL LEADERSHIP

White Oak Creek Watershed

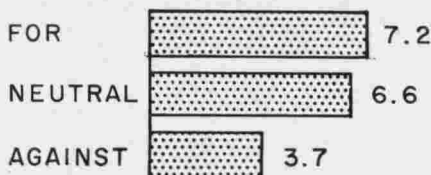
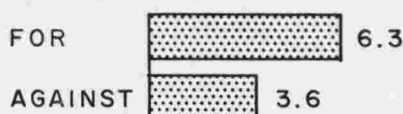
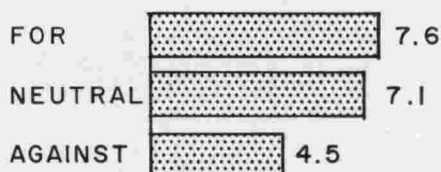


Figure 4. Relationship of landowners' attitudes toward local leadership to the watershed program.

Swan Creek Watershed



Johnson Creek Watershed



^aThe higher the score, the more favorable the attitude toward leaders.

get the program accepted. Other landowners—not realizing that a final decision had not been made—were concerned that they had not been told more definitely where dams would be located and how much the program would cost them; to some this implied that the leaders of the watershed program were withholding information from them. It was apparent that a few landowners were opposed to the local watershed program largely because they had formed a previous dislike or distrust for one or more of the persons actively supporting the program. On the other hand—and this was especially apparent in both the upper and lower parts of Johnson Creek—some landowners supported the watershed program largely because they had previously developed confidence in the leaders of the program.

Attitude of Landowners Toward the Federal Government

In authorizing Federal assistance for watershed protection and flood control through U. S. Public Law 566, it was emphasized that the specific projects were to be planned and developed by the local residents. Yet, apparently in the minds of many local people the program has become identified with the Federal government. Preliminary investigation in Tennessee watersheds suggested that if landowners took a "dim view" of Federal participation in local affairs, they were more inclined to assume negative attitudes toward the watershed program. Conversely, landowners who did not particularly object to Federal participation seemed more inclined, other things being equal, to go along with the program.

Landowners were asked two questions which were intended to reveal their attitudes toward Federal participation in local affairs. Responses to these questions gave little support to the hypothesis that landowners who did not object to local Federal participation would be more inclined to favor the watershed program.

Participating in Watershed Program. First, landowners were asked "Would you say that in general the Federal government

Table 9. Relationship of Attitudes Toward Federal Participation in Local Erosion-Control and Flood-Prevention Activities to Landowners' Attitudes Toward the Watershed Program, Tennessee, 1957

Attitude toward local-federal participation	Attitude toward the watershed program			
	For	Neutral	Against	All
	— Number of landowners —			
White Oak Creek Watershed				
Government should help	30	5	11	46
Neutral or do not know	3	0	1	4
Government should not help	1	2	5	8
No comment	13	4	7	24
Swan Creek Watershed				
Government should help	16	-	13	29
Neutral or do not know	2	-	2	4
Government should not help	0	-	2	2
No comment	7	-	9	16
Johnson Creek Watershed				
Government should help	32	2	0	34
Neutral or do not know	2	4	1	7
Government should not help	2	1	2	5
No comment	2	2	1	5

should help the farmer in preventing soil erosion and floods?" Responses to this question are shown in Table 9. In all three watersheds relatively few landowners expressed opposition to Federal participation in local erosion-control and flood-prevention activities. A sizable proportion in each watershed—29 percent of the landowners in White Oak Creek, 31 percent in Swan Creek, and 10 percent in Johnson Creek—declined to express opinions. Of those who expressed opinions, only in Johnson Creek did there appear to be an apparent relationship between feelings about Federal participation and attitudes toward the watershed program.¹⁴ Here landowners who were in favor of the watershed program tended to be more sympathetic toward Federal participation in local affairs.

Participating in Private Affairs. The second question asked was, "Do you think that, in general, the Federal government meddles with farmers and private industry too much?" This was designed to indicate landowners' overall reactions to the role of the Federal government. Responses to this question are shown in Table 10. In each of the three watersheds, landowners were fairly

¹⁴This conclusion is based on subjective examination since there were too few observations in some categories to allow the use of the Chi-square test.

Table 10. Relationship of Attitudes Toward General Federal Participation to Landowners' Attitudes Toward the Watershed Program, Tennessee, 1957

Attitude toward federal participation in general	Attitude toward the watershed program			
	For	Neutral	Against	All
	— Number of landowners —			
White Oak Creek Watershed				
Government does not interfere too much	8	2	4	14
Neutral or do not know	19	5	10	34
Government does interfere too much	10	1	4	15
No comment	10	3	6	19
Swan Creek Watershed				
Government does not interfere too much	7	-	3	10
Neutral or do not know	7	-	9	16
Government does interfere too much	2	-	7	9
No comment	9	-	7	16
Johnson Creek Watershed				
Government does not interfere too much	18	0	0	18
Neutral or do not know	12	5	1	18
Government does interfere too much	6	2	3	11
No comment	2	2	0	4

equally divided as to whether they 1) thought the Federal government interfered too much with farming and private industry; 2) thought the Federal government did not interfere too much; or 3) held no strong feelings one way or the other. As with the previous question, a sizable group of landowners in each watershed—23 percent in White Oak Creek, 31 percent in Swan Creek, and 8 percent in Johnson Creek—declined to give opinions. Of the landowners who did express opinions, again only in Johnson Creek was there an apparent relationship between attitudes toward Federal participation in private affairs and feelings toward the watershed program.¹⁵ Here landowners who were for the watershed program were more inclined to be sympathetic toward Federal participation in private affairs.

Landowners' Suggestions for Improving Watershed Program

Landowners were asked how they thought the watershed program could be improved, particularly with respect to the enabling legislation itself and the steps followed in organizing the program locally. Most of the landowners had no suggestions or felt they knew too little about the program to make suggestions. The suggestions which were made, along with the number of landowners making each suggestion, are presented in Table 11.

Some landowners were not satisfied that construction of large dams would be the most effective means of reducing floods in their watershed. They saw stream channel improvement, drainage ditching, and soil-conserving land uses as being possible substitutes for large structures downstream. These landowners argued further that these substitutes would be less likely to disrupt entire farming programs than would large water retention structures.

Three landowners said they thought the Federal government should pay for the costs of dam sites and rights-of-way in addition to the construction costs of major structures. Some were concerned that landowners in the upper reaches of the watershed might have to help pay for the local share of the program costs, even though they would not benefit from the program.

The most frequent suggestion was that more information about the program be made available to landowners when the watershed districts are being organized. Landowners were particularly concerned about the lack of authentic information concerning 1) the location of proposed dams and other structures and 2) how much

¹⁵This conclusion is based on subjective examination since there were too few observations in some categories to allow the use of the Chi-square test.

Table 11. Landowners' Suggestions for Improving the Watershed Program, Tennessee, 1957

Suggestion	Number of landowners making the suggestion ^a		
	White Oak Creek Watershed	Swan Creek Watershed	Johnson Creek Watershed
Measures of improvement			
1. Building many small dams on tributaries instead of a few large ones on the main streams		3	
2. Substitute other measures (such as channel improvement) for dams	1		
3. Develop flood-control and watershed-protection measures on individual farms rather than building a few large dams		1	2
Financing the program			
1. Have the Federal Government pay costs of dam sites and rights-of-way, in addition to construction costs		1	2
2. Have only the landowners who benefit directly from the program share in local costs.		1	
Organizing the local program			
1. Provide more information about the program (location of proposed measures, source of farming, etc.)	2	7	1
2. Try to locate dams and other structures on sites owned by landowners who are willing to release their land, rather than forcing landowners to give up land	2	1	
3. Assemble an accurate list of the landowners who are eligible to vote in referendums and elections related to program	1		
4. Hold public hearings in every county in the watershed instead of the county which contains the greatest portion of the watershed.	1		

^aThese are the landowners who responded when asked specifically whether they had suggestions. Many other landowners by chance brought out similar criticisms and suggestions in the course of answering other parts of the questionnaire.

they would be required to pay. Of course, at the time landowners are voting whether to organize into a watershed district, these decisions have not yet been made. But it appears that the landowners—particularly those in White Oak and Swan creeks—would have been more satisfied if they could have had some indication of the structures and local costs which were likely to be involved.



Sediment deposited on flood plains results in heavy damage to crops and land. Here pictured is sand overwash on a cotton field in Johnson Creek Watershed. One flood in 1955 resulted in so much sand overwash as to take this field out of agricultural production.

A few landowners expressed concern that they or some of their friends might be forced, under the districts' rights of eminent domain, to sell their land for dam sites and rights-of-way. They were afraid not only that the individuals' earning capacities might be reduced, but also that it would sometimes mean moving away from farms and neighborhoods with which a family had been associated for many generations. It was felt that, so far as possible, watershed boards of directors should try to obtain dam sites and rights-of-way from landowners who were willing to give up part or all of their land for flood-control purposes.

One landowner thought the public court hearings at which methods of financing are approved and objections of individual landowners are reviewed should be conducted in the particular counties involved, rather than be conducted by the county which contains the greatest portion of the watershed (as now provided in the Tennessee enabling legislation). He felt that, if the county having the most land were predominantly composed of flooded acreages in the lower part of the watershed, landowners in the upper reaches of the watershed might be placed at a disadvantage.

Other landowners expressed this same concern during other parts of the interview.

Implications of the Study

In the formal analysis presented in the preceding section, the factors which were believed to have some bearing on landowners' attitudes toward the small watershed program have been dealt with separately and largely in terms of averages for groups within each of the three watersheds. These separate relationships in themselves provide a general, but perhaps somewhat conflicting, picture of the considerations which are important when initiating a watershed-development program under Public Law 566. A broader perspective can be achieved if the separate parts of the study are brought together and interpreted in the light of less formal impressions which interviewers received while conducting and analyzing the study. The observations presented here are by no means conclusive and may reflect personal biases or lack of complete understanding on the part of those conducting the study. Yet these impressions may point up some things which are worth considering in future watershed program development.

Important Factors Related to Forming Attitudes

It was apparent that there were a number of non-monetary obstacles to the acceptance of the watershed-development program by landowners. Judging from the results of the survey, an individual landowner was likely to consider one or more of the following things when forming an opinion about the program:

1. The economic benefits which he expected to receive relative to the amount he thought he would have to pay into the local program.
2. His confidence in the persons and organizations which were spearheading the movement to establish a local watershed development program.
3. His feeling about whether any of his friends or neighbors might be "hurt" monetarily or be forced to move as a result of the watershed program.
4. The degree to which he thought his own and neighboring landowners' rights and independence would be infringed upon by the program.

A thorough understanding of the program did not necessarily mean that landowners would be more inclined to accept it. In fact, sometimes the more a landowner learned about the projects which were likely to be proposed, the rights which he and his neighbors would have, and the local costs which would be involved,

the more he became opposed to the program. But frequently it was the lack of complete information and the existence of inaccurate or conflicting information that caused landowners to oppose the organization of a watershed district. The fact that leaders and technical personnel could not say definitely what local watershed projects were going to be developed and what the costs would be sometimes led residents to believe that information was being withheld from them. This often caused some landowners to become suspicious of the motives of those who were supporting the local program. These landowners sometimes did not realize that, by organizing a watershed district, they were setting up a legal facility through which they could choose representatives (the board of directors) to consider the watershed management problems and their possible solution.

Few landowners, in forming opinions about the local watershed program, thought in terms of how the program would affect the people and economy of the watershed as a whole. Instead, most of them were inclined to base their conclusions on how the program was likely to affect themselves personally and their neighbors and friends. This suggests that a watershed-development program, if it is to be successfully organized from the local standpoint, might need to include proposals that appeal to each sector within the watershed rather than being oriented to the net effects on the entire watershed.

Variation in Attitudes by Geographical Area

One landowner may form an opinion for or against the local watershed program for quite a different reason from what another does.

The reasoning followed may be associated with various geographical locations or neighborhood groups within the watershed. This was particularly apparent in the White Oak and Swan Creek watersheds. Landowners in the lower, flooded portions of the watersheds were inclined to support the watershed program because they believed they would benefit financially from the flood-prevention projects. Those who were located where dams and other major structures were likely to be situated—above the lower, flooded portions, but below the upper extremes—were not only concerned about money losses that they or their neighbors might suffer, but also about the less tangible effects on their rights and freedoms. To some extent their attitudes were influenced by confidence or lack of confidence in the leaders of the local program.

Those in the upper reaches of the watersheds tended to be less concerned one way or another about the program. Their attitudes toward the program seemed to be based on 1) how the program was likely to affect friends or relatives in other parts of the watershed and 2) the confidence they had in the people and groups supporting the program. Not infrequently these landowners in the upper portions seemed to be opposed to the program largely because they thought persons in the lower portions would benefit, while they themselves would not gain anything.

This suggests that it may sometimes be desirable, from the standpoint of those interested in developing a local watershed program, to modify proposed projects so that they will appeal more to those in the upper parts of the watershed. Instead of constructing a few large dams, which may disrupt some landowners' entire farming systems, greater emphasis on land treatment measures and channel clearing might be considered. Adding provisions for development of recreational facilities, irrigation projects, or municipal water supply improvement (even though Public Law 566 does not provide Federal aid for these purposes) might gain wider acceptance of the program. If opposition to the program is centered in the upper reaches of the watershed, the watershed district might even consider subsidizing landowners for the soil conservation practices they introduce. (These payments would be in addition to those already available under the Agricultural Conservation Program.) In this way, those who now have land flooded might still be made "better off" by the program; at the same time they would be providing other landowners with incentives to support the program.

The things which cause most landowners in one watershed to favor or oppose the watershed program may not be the same as those considered in another. This was apparent among the three watersheds included in the study. Landowners in Johnson Creek seemed to have a great deal of confidence in the local leaders who supported the program and the local agricultural workers associated with the program (county agents, soil conservationists, etc.). As a result, landowners in Johnson Creek seemed to support the watershed district largely because these leaders said the program was a "good thing." Often this support was given even though the landowners did not yet know what projects were to be developed or what local costs were to be involved. Concern over monetary effects of the program and antagonisms among various groups within the watershed seemed to be stronger in White Oak and

Swan creeks. The fact that Johnson Creek watershed is relatively small and located entirely in one county may partly explain why fewer group conflicts developed here.

These differences from watershed to watershed suggest that organization of a district might best be approached with the characteristics of the particular residents in mind. In a watershed which is large and contains several rather distinct groups, a special effort might be made to insure that the interests of all the groups in the watershed are represented from the start. In a watershed where residents have strong attachments to their farms and neighborhoods, a special effort might well be made to develop plans which would avoid forcing some to move to new locations.

Importance of Understanding the Watershed Program

Perhaps an important link in a sound evaluation of watershed-management problems and the development of effective solutions to these problems is an educational program designed to inform watershed residents about the intent and provisions of the watershed-district proposals. In the watersheds studied, it was clear that some of the confusion and misunderstanding which existed resulted from misleading or incomplete information in the early stages. Very definite attempts were made to acquaint all the residents with the program, but sometimes this was after many had already formed opinions on the basis of rumors and second-hand reports.

The results of the survey indicated that many landowners did not attend educational meetings related to the watershed program or read the available literature about the program. Instead, they went to neighbors and local leaders for information and opinions about the program. This suggests that those who are interested in organizing a watershed district might want to make a special effort to provide local officials and informal leaders in the various parts of the watershed with complete and accurate information from the very start.

The survey results also suggested that leaders of watershed districts which organize in the future might want to use newspapers, radio, and other mass media more intensively as a way of informing residents about the program.

Suggested Legislative Changes in Watershed Program

As indicated earlier, the Tennessee Watershed District Act of 1955 authorizes watershed residents to organize into districts for flood prevention, watershed protection, and water resource develop-

ment. Through this act, Tennessee, unlike some other states, has provided these districts with rather broad, yet flexible, functions and powers.¹⁶ Yet the experiences of the three watershed districts studied suggest that certain modifications or additions in the Tennessee Act might be worth considering as a way of making the watershed program more acceptable to local people.

Some landowners who were interviewed were concerned that the projects to be developed, the means of financing them, and the appeals of individual residents were to be reviewed by the county court in the county which contains the largest portion of the watershed. They thought that landowners located in the major county might be favored. Some suggested that the Tennessee Act be modified so that the hearings would be held in each county concerned. This arrangement conceivably could lead to some confusion and lack of coordination from the point of view of the entire watershed district. Another possibility would be to establish a state agency which would review local watershed program proposals and act as an arbitrator when disputes arise.

Some landowners who had been active in the development of a watershed district indicated that the leaders had difficulty in finding ways to finance incidental costs, such as legal advice, which were incurred when the district was first being organized. A possible solution to this problem might be the establishment of a state agency which would make loans available to watershed districts and, in addition, provide legal assistance in setting up the local programs.

¹⁶R. C. Otte, *op. cit.*, summarizes the provisions of the various state laws related to local watershed development.

APPENDIX

Appendix Table 1. Relationship of Knowledge About the Watershed Program to Landowners' Attitudes Toward the Program, Tennessee, 1957.

Knowledge score	Attitude toward watershed program			
	For	Neutral	Against	All
	— Number of landowners —			
White Oak Creek Watershed				
Low (0-6)	7	3	10	20
Medium (7-13)	27	7	13	47
High (14-21)	13	1	1	15
Swan Creek Watershed				
Low (0-6)	7	-	10	17
Medium (7-13)	13	-	12	25
High (14-21)	5	-	4	9
Johnson Creek Watershed				
Low (0-6)	21	7	1	29
Medium (7-13)	14	2	3	19
High (14-21)	3	0	0	3

Appendix Table 2. Relationship of Attitudes Toward Local Leaders to Landowners' Attitudes Toward the Watershed Program, Tennessee, 1957.

Attitude toward local leadership	Attitude toward watershed program			
	For	Neutral	Against	All
	— Number of landowners —			
White Oak Creek Watershed				
Low (3 or less)	4	3	12	19
Medium (4-6)	6	0	10	16
High (7 and above)	37	8	2	47
Swan Creek Watershed				
Low (3 or less)	3	-	13	16
Medium (4-6)	7	-	7	14
High (7 and above)	15	-	6	21
Johnson Creek Watershed				
Low (3 or less)	0	1	1	2
Medium (4-6)	5	1	3	9
High (7 and above)	33	7	0	40

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