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Economic, Social and Governmental
Problems Encountered in the Development
of the Wappapello Flood Control Area in
Missouri

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INTRODUCTION

The United States was settled under a policy that encouraged owner operation of farms. Settlers were attracted to the new world by the prospect of land ownership. Capital was scarce and land that could be occupied with the least effort was settled first. Merchantable timber provided immediate income, and the wooded hills of the Ozark region were a refuge for game, which was a principal source of food. Poorly drained land in the valleys could not be improved without considerable cost. These advantages and disadvantages caused hill country to be occupied before the valleys.

When capital became more abundant, people began to look for opportunities to invest their savings in land improvements where returns would be high. Delta land along the Mississippi river was highly productive, but it was flooded frequently and needed drainage. Large-scale flood-control and drainage projects required a new type of public policy. Early policy was designed to get land into the hands of private owners as quickly as possible. Now, it is to develop land to improve the conditions under which people work and live. Goals are governed by what people desire. The programs adopted are designed to achieve the goals implicit in the policy. Short-run programs are closely related to what people think the government can and should do to bring about desired changes.

The two master goals of American economic policy are: (1) to increase to the maximum the social product over time, and (2) to achieve optimum distribution of income among people. The first is concerned with the problems of misuse of human and physical resources in the production process and the second is concerned with problems of inequities in the distribution of real income among families.¹

Implementation of a program to change land use should include adjusting fairly both the land-holding pattern and the institutions that serve the community. Involuntary relocation should take place with as little hardship as possible. The people responsible for the program should not lose sight of the long-

¹John F. Timmons and William G. Murray, *Land Problems and Policies*, (The Iowa State College Press, 1950), p. 6.

time goal. This goal is use of resources in a way that will satisfy the maximum number of wants. Farmers and business men who have inefficient combinations of economic factors may profit by taking the present value of their property and finding a new location in a remote community. The task is not to reestablish existing conditions, but to improve them.

This is a report of procedures used to acquire land and relocate people who lived in the Wappapello area in Missouri. It is an effort to test these concepts, to appraise the procedures used to implement this new resource use policy, and to determine whether or not the effects were consistent with the goals. Specifically, this was a study of the impact of a flood-control project upon a community. It examines both economic and social aspects.

NATURE OF THE PROBLEM

Wappapello reservoir was developed for two major purposes: (1) to increase efficiency in the use of resources over time, and (2) to improve the distribution of income. No attempt was made to verify the benefit-cost ratio or to examine the data used in arriving at the decision to develop the project. It was assumed that the ratio was reasonably accurate. Only the methods used to carry the work to completion were subjected to study.

The written history of this project revealed that using storage reservoirs on the St. Francis river was not considered feasible. Including flood control reservoirs, with or without development of water power, increased the cost of any project without a corresponding increase in benefits. The plan finally adopted included a reservoir, the Wappapello Reservoir. It can be speculated that because it was adopted and put into operation in the 1930's, it was made a part of the Public Works projects to create employment, augment consumer purchasing power and thereby attain the second of the broad American goals—bring about a more optimum distribution of income among people.

METHOD OF STUDY

This study was planned to describe and measure the economic and social impact of the Wappapello Reservoir upon the immediate community. Four basic assumptions were made:

1. Any land taken over by the government for the purpose of flood control and leased for agriculture, forestry, recreation or other use should be operated in the interests of the operators and the government according to recommended practices in land management for the greatest economic and social benefit as long as such practices do not interfere with flood control.
2. The operation of any land held by the government and leased to individual operators should not preclude a level of living among these operators

comparable with the level of living prevailing in the general area.

3. Families moved from an area should be compensated or assisted enough to establish them in occupations economically and socially comparable to those they previously held.
4. Services of other public institutions in the area should be adjusted so that they can function as effectively after the installation as before.

It was assumed that the best interest of society would be served by controlling floods on the St. Francis River. The flood control plan included a reservoir which made it necessary for the government to buy from private ownership, land that would be flooded because of the dam. A minimum area would be occupied by a conservation pool which would have no value except for wildlife. Between the elevation of the spillway and the elevation of the conservation pool was a land area that could be used for farming, forestry, and recreation.

The first assumption listed above implies that the land would be classified according to its best use. The assumption also implies that after the land was classified, it would be managed according to the best practices recommended. This could result in management responsibility being shifted to government agencies.

The second and third assumptions imply that appropriate consideration would be given to relocating people. The fourth assumption suggests that institutions should not be penalized as a result of changes in resource allocation. Some plan for reorganization should be adopted to serve the best interests of all concerned.

Source of Data

Background data for the study were obtained from the records of the Corps of Engineers and from Congressional Records. Primary data were obtained from interviews with local leaders, officials, businessmen, and farm and city people who were in the community at the time the reservoir was built, or who had moved into the area since that time. Eighty farm families and 30 town families were interviewed, the latter from the city of Greenville, Missouri.

Of the 80 farm families interviewed, 20 were operating land in the Wappapello Reservoir in 1948 under government lease. Thirty-two had lived in the reservoir area in 1940 but in 1948 were operating farms outside. Twenty-eight had lived in the reservoir area in 1940 but by 1948 had retired or were following non-farm occupations. One-fourth of the farm families directly affected by the development of the reservoir were interviewed. The 30 families in the new town of Greenville, interviewed to learn about problems of relocating a town, constituted about one-third of the population of the town.

Data on recreational development were obtained by personal interviews and from questionnaires sent to holders of leases of lands to be used for recreational purposes.

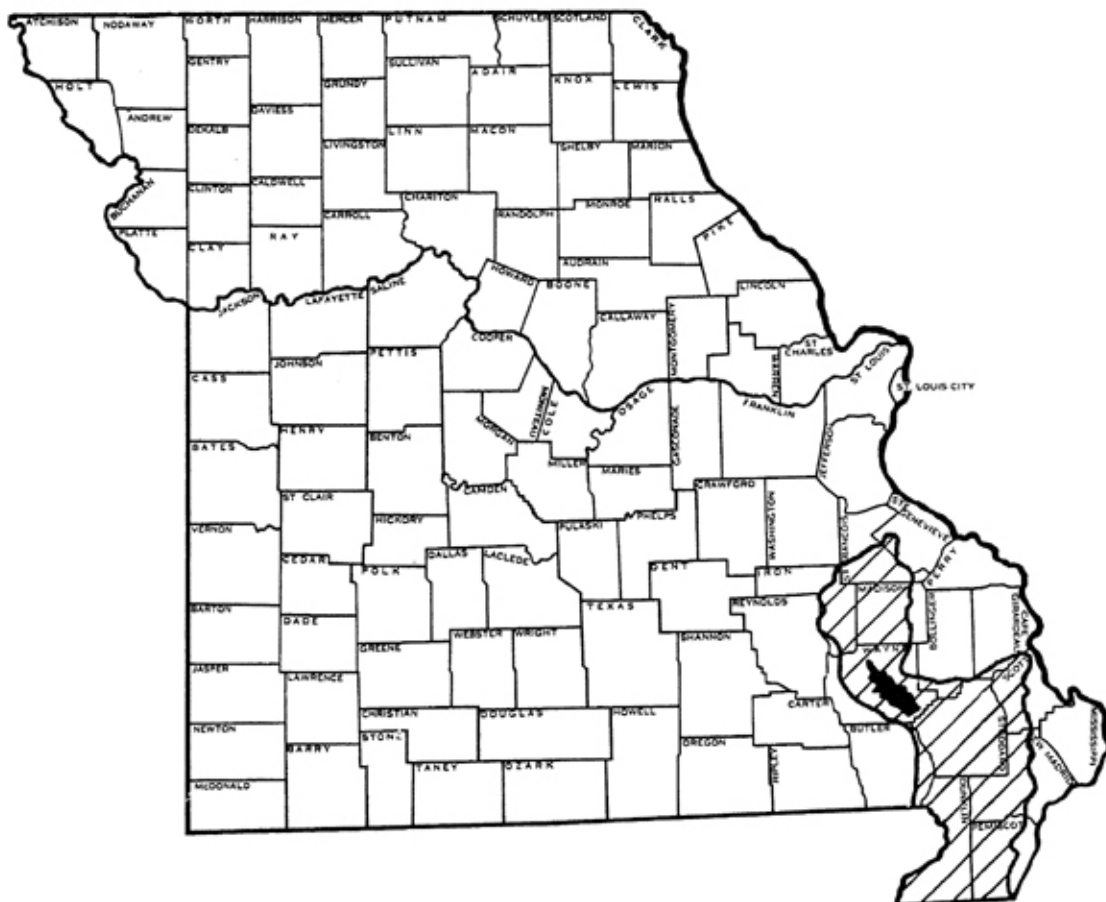


Fig. 1—St. Francis watershed and Wappapello Reservoir.

GENERAL DESCRIPTION OF THE WAPPAPELLO AREA

The Wappapello Area refers to that portion of the St. Francis watershed located in Missouri (Figure 1). It includes the dam and reservoir in Wayne County as well as the lower stem of the St. Francis River where levees were to be constructed to aid in disposing of the water detained by the reservoir.

St. Francis Watershed

The St. Francis watershed lies in two states, Missouri and Arkansas. It has four distinct areas. One is the hill section north of Wappapello, Missouri, above the site of the reservoir. The second area is the Advance lowlands between Wappapello and the north end of Crowley's Ridge. The third area is the Sunk Lands between the towns of St. Francis and Marked Tree, Arkansas. The fourth is the area below the foot of the St. Francis Lake where the St. Francis River lies in a true alluvial valley of the Mississippi River.

Above Wappapello, the St. Francis drains 1,310 square miles. In addition to Wayne County, the area includes parts of Iron, St. Francois and Madison counties.

Below the Wappapello reservoir, the St. Francis River flows south 400 miles, entering the Mississippi River eight miles above Helena, Arkansas. The total drainage area of the river is about 8,735 square miles. The principal tributary watersheds are: the Little River which enters St. Francis near Marked Tree, Arkansas, about 150 miles from the Mississippi River; the Tryzona River which enters near Parkin, Arkansas, 130 miles from the Mississippi; and the L'Anguille River which enters the St. Francis 12 miles from its mouth. Originally the drainage area of Little River was 3,200 square miles, but the upland area of this watershed has been cut off by a diversion channel which carries its runoff into the Mississippi River thus leaving 2,050 square miles of flat land as the Little River tributary to the St. Francis.

Wayne County

Wayne County was authorized in December, 1818, by the Territorial Legislature. The area so designated was erected from the southwest part of the county of Cape Girardeau and the eastern part of the county of Lawrence (as the counties existed at that time). The new county because of its great size was often spoken of as the "State of Wayne". County after county has been taken from this territory, but from the first to the present, Greenville has been the county seat of Wayne County.

Greenville was laid out as the "seat of justice" for Wayne County in 1819. The town was located upon the bank of the St. Francis River on Spanish Grant No. 787. Because it was isolated, it grew slowly. In 1826 it was inundated by an overflow of the St. Francis, and much damage was done by high water again in 1863. By 1874 the town's population numbered 300 and it contained a Masonic Hall, two stores, one hotel and one newspaper, *The Greenville Times*.

Before any white settlers came into Wayne County, nearly all of the 496,000

acres of land within its present boundaries were covered with virgin pine and hardwood forests. Yellow pine was the principal basis for labor and commerce in Wayne County. By 1874 more than twenty sawmills were operating making great inroads upon the extensive yellow pine forests.

Development of Wayne County and the town of Greenville paralleled activity in the lumber industry. Most of the Ozark pine was cut between 1880 and 1910. The peak of lumber production in Missouri was reached in 1899. By that year the population of Greenville had reached 1,051 persons. There were ". . . a graded school, Baptist, Methodist, Christian, and Catholic churches, three hotels, a flouring mill and numerous stores and other business places." A railroad had been built into the town to haul logs and lumber. At Greenville, a saw and planing mill of 150,000 ft. capacity was operating.

Lumbering continued for some time after 1900. Small sawmills were operating there at the time of this study. But extensive logging by lumber companies had removed all but scattered stands of marketable timber. The town of Greenville, which had grown up with the lumber industry, began to lose population by 1910 and declined steadily through the following decades (Table 1). The railroad built into the town was abandoned and its roadbed became the base for a highway built in 1918.

TABLE 1--POPULATION OF WAYNE COUNTY, ST. FRANCIS TOWNSHIP, GREENVILLE, PIEDMONT AND WILLIAMSVILLE, 1870-1940

Year	County Number	Township ^{1/} Number	Towns		
			Greenville Number	Piedmont Number	Williamsville Number
1950	10,514	1,770	270	1,548	492
1940	12,794	2,382	572	1,177	511
1930	12,243	2,283	506	916	428
1920	13,012	2,357	614	1,086	448
1910	15,181	3,071	941	1,154	477
1900	15,309	3,537	1,051	858	215
1890	11,927	2,071	---	829	435
1880	9,096	---	---	666	184
1870	6,068	---	(1874 - 300) ^{2/}	---	---

^{1/} The township in which Greenville is located.

^{2/} Source: R. A. Campbell, editor, *Campbell's Gazeteer of Missouri* (St. Louis: R. A. Campbell, Publisher, 1874), p. 639.

Located on the banks of the St. Francis River, the town of Greenville was subjected to repeated flooding. Residents kept wooden horses and planks to make platforms for "putting up" heavy furniture to keep it above the rising water. They carried smaller pieces to the second floor. Having prepared for the flood, the people would move to the courthouse or school or to some other shelter on higher ground to wait until the water receded. After the flood they carried water to scrub the mud from their houses. It was necessary to clean out

the wells after the river overflowed them. Since 1900, major floods occurred in 1904, 1915, 1916, 1918, 1935 and 1937. Minor floods inundating part of the town were even more frequent.

The population of Wayne County reached a peak in 1900. The population in 1940 was only about 85 percent of the number in 1900. The population of Greenville in 1940 numbered 572 or 54 percent of the peak of 1,051 reached in 1900. The major population losses were in the decades 1910-1920 and 1940-1950 (Table 1). The small increase in population between 1930 and 1940 reversed a long-time downward trend, but other Ozark counties showed an increase in population in 1940 (Table 2). This reflected a temporary "back to the country" movement during the depression of the early 1930's. The decline was resumed between 1940 and 1950.

TABLE 2--POPULATION OF SELECTED OZARK COUNTIES
IN MISSOURI, 1870-1940

Year	Wayne	Carter	Oregon	Reynolds	Shannon
	<u>Number</u>	<u>Number</u>	<u>Number</u>	<u>Number</u>	<u>Number</u>
1950	10,514	4,777	11,798	6,918	8,377
1940	12,794	6,226	13,390	9,370	11,831
1930	12,243	5,503	12,220	8,923	10,894
1920	13,012	7,482	12,889	10,106	11,865
1910	15,181	5,504	14,681	9,592	11,443
1900	15,309	6,706	13,906	8,161	11,247
1890	11,927	4,659	10,467	6,803	8,898
1880	9,096	2,168	5,791	5,722	3,441
1870	6,068	1,455	3,287	3,756	2,339

From the first, farming was in the fertile bottoms along the St. Francis. Though there were some iron ore deposits in Wayne County, and iron mines were opened in 1873, mining never became an important industry. Building stone was plentiful and was used locally in homes and business buildings, but was never shipped out. Consequently, following the depletion of the forest resources, income from farming became the major economic base for the community.

Farms along the St. Francis River were often a combination of hill and bottom land. The enterprises were extensive rather than intensive. Corn was the principal crop and was fed to livestock. Open range prevailed and cropland had to be fenced to keep out livestock. The open range permitted many farmers to carry more livestock than their own land would support. The main crop areas in Wayne County were along the St. Francis and Black rivers.

Many farmers also worked part-time in the timber industry and in ore mines. These industries offered little long-time security.

Neighborhood and community ties were close in the Wappapello area before the reservoir was built. Since many families did not have cars, the usual

services were brought to them in neighborhood stores, open-country churches and local schools. There was much social isolation but it had begun to break down. Children had started to attend high school and to look to the outside for jobs.

PROGRAM FOR FLOOD CONTROL

Frequent flooding, the possibility of navigation, power development and irrigation prompted Congress to authorize a study of the St. Francis River in 1927. Previous investigations had been made as a result of the river and harbor act of 1916 to determine navigation potentials. The first comprehensive report was submitted by the War Department to Congress in 1929.²

The report presented the following conclusions: No change in existing navigation was justified. Irrigation was unnecessary. The cost of water power development would be prohibitive. Flood control for 91 percent of the 2,300 square miles subject to overflow by the St. Francis River above the backwater area was economically feasible.

Methods of Control

The original surveys gave the engineers enough data to compare different methods of flood control. The four methods studied were control by the use of (1) storage reservoirs, (2) diversions, (3) channel enlargement, and (4) levees.

Reservoir capacity was found sufficient to regulate the greatest runoff on record from the hill area. The storage capacity required depended upon (1) the limits to which the discharge at Wappapello was controlled, (2) the capacity of the channel between Wappapello and the town of St. Francis, Arkansas, and (3) the amount of flood water contributed by the drainage area below the lowest reservoir site.

The cost of providing the larger amount of storage was balanced against the cost of levees required to supplement a lesser amount of storage. The engineers concluded that, if floods were to be controlled by means of reservoirs, the most feasible plan was to employ the reservoir having a capacity of 733,000 acre-feet supplemented by a certain amount of levee construction between Wappapello, Missouri, and St. Francis, Arkansas. It was considered necessary that the reservoir be emptied within 40 days after a major flood. The various sizes of reservoirs studied would have little effect on flood heights below St. Francis Lake.

Five different projects for diverting flood waters were considered. The only one thought to be economically feasible was one proposed at the lower end of St. Francis Lake in Area Four.

Flood protection by channel enlargement was found feasible in only a small portion of the St. Francis River proper. For the most part, it seemed feasible

²*St. Francis River, Missouri and Arkansas*, House of Representatives Document No. 159, 71st Congress, 2nd Session.

only in the Sunk Lands and on certain portions of the tributaries of the St. Francis.

Flood control by levees was considered applicable to any section of the St. Francis below Wappapello. Experience with soils in the area indicated, however, that the levees would have to be kept outside the swamp in the Sunk Lands. In that area channel enlargement was considered the most feasible method.

Engineers compared the four methods of flood control and considered the comparative cost of each method. They found that the inclusion of flood control reservoirs, with or without development of water power, increased the cost of any project without giving a corresponding increase in the benefits received. Their conclusions were that a combination of levees, channel enlargement, and floodways would provide the most economical and satisfactory method of controlling the floods of this river.

Justification

The capitalized value of the recurring damages from floods was estimated at \$28,000,000 while the cost of the proposed plan including capitalized maintenance was only \$17,427,000. It appeared that the work was economically justified. The District Engineer found, however, that no Federal interests of any importance were benefitted by the project. He pointed out that this area was originally subject to overflow by both the Mississippi and the St. Francis rivers. In protecting this area from the waters of the Mississippi, local interest had spent nearly \$20,000,000. The United States had spent more than \$9,000,000 and at that time had undertaken an enlargement project calling for additional expenditures of more than \$15,000,000. The Chief of Engineers considered that such expenditure was more than sufficient to cover any possible Federal interest in the work and recommended that the entire cost of the proposed project should be met by local interests.

Authorization

An Act of Congress, passed June 15, 1936, authorized the Secretary of War with the supervision of the Chief of Engineers to undertake the projects for control of floods on the St. Francis River. It provided that the Chief of Engineers could, with the approval of the Secretary of War, modify the project to include detention reservoirs. The cost of acquiring all land and flowage necessary for the construction of the reservoir, except cost of highways, was to be borne by the United States, provided the estimated cost to the United States of the project was not increased by the inclusion of such detention reservoir. The project could not be undertaken nor could any money be expended on the construction of the reservoir until drainage districts, counties, and other responsible agents concerned had given satisfactory assurance to the Secretary of War that they would provide, without cost to the United States, all lands, easements and rights-of-way for the construction of projects other than the reservoir. These

other projects included such items as the supplemental levees below the Wappapello reservoir, channel enlargement in the Sunk Lands, and diversion ditches below St. Francis Lake.

The plan put into operation as a result of the flood control act of 1936 was a modified version of the plan recommended by the Secretary of War and Chief of Engineers in 1929 and included a detention reservoir at Wappapello, Missouri. Apparently, local political pressure was sufficient to cause a change in plans even though original estimates did not indicate that a detention reservoir was economically justified when compared to levees. In addition, the philosophy of the Federal Administration after 1932 permitted the spending of large sums of money by the Federal government even though no specific Federal benefits resulted from the expenditure. The fact that the expenditure provided jobs for the unemployed and served as a stimulus for the economy of the area seemed sufficient reason for the Federal government to undertake construction of the flood control reservoir. Congressmen and persons sympathetic to the project felt that local interests had made more than their fair share of contributions in personal flood losses and in levees which had been built with local funds and destroyed by the disastrous flood of 1927.

Apparently, the local interests in Missouri and Arkansas adjacent to the St. Francis River gave the necessary assurance that all land, easements, and rights-of-way would be provided because initial work on the Wappapello reservoir began soon thereafter. Little was accomplished in the first two years because the Act did not give the Corps of Engineers specific authorization to take title to land for the Reservoir even though they were authorized to bear the cost as provided. The flood control act of 1938 did give them such authorization and land acquisition began soon thereafter.

The flood control act of 1938 still made it necessary for local interests to bear the cost of land, easements and rights-of-way for the supplemental levees. Because local participation in this phase of the work was slow or practically non-existent, additional legislation was passed in 1946. This act provided that the cost of acquiring title to the land for the supplemental levees would be borne by the United States.

Reservoir and Levees

The most economical size of reservoir which would provide flood protection down to the St. Francis Lake was one that had a gross capacity of 733,000 acre-feet and a controlled discharge of 10,000 cubic feet per second. The capacity of the channel below the reservoir and down through the Advance Lowlands when bank full was about 5,000 cubic feet per second. Levees, then, were necessary under normal operation of the reservoir. Those originally proposed to supplement the reservoir would have provided a floodway sufficient to take care of the discharge of Wappapello, the amount of flood water contributed by the drainage area below the reservoir site, and a margin for safety.

Numerous levees were in the area before the reservoir was built. Some were inadequate; others were in need of repair. From Wappapello to the foot of St. Francis Lake the levee system was to be strengthened and completed. Most of the levees located in Missouri had sufficient height and section. In Stoddard County, however, additional levees were needed from the St. Louis and San Francisco Railroad south to Crowley's Ridge in Dunklin County. In some places the levees were to be raised and strengthened and gaps filled. In Dunklin county near Kennett, the proposed plan was to set back the east side levee to provide a wider flood channel.

Description of Wappapello Reservoir

The Wappapello Reservoir was irregular in shape. Many bays or arms extended long distances up the valleys of tributary creeks. The reservoir consisted of a conservation pool to elevation 355, with the space above, to elevation 395 available for flood storage. Land up to elevation 400 or higher was acquired for reservoir control and to minimize severance damage. The spillway crest was established at elevation 395.³

The lake, at conservation pool level of 355, had a surface area of about 5,700 acres, while the flood pool, at elevation 395, had a surface area of 23,100 acres. Along the main valley, the area at flood pool elevation of 395 was a mile or more wide and included some 40 miles of the St. Francis River.

Of the 44,592 acres of land needed for the reservoir, 5,700 acres were to be permanently inundated by the conservation pool and 17,400 acres were to be inundated for varying periods of time by the flood pool. The area of 21,492 acres above the flood pool elevation was to be acquired primarily for reservoir control and to minimize severance damage. Only in the lower elevations would this area above elevation 395 be subject to inundation as a result of the operation of the reservoir and then very infrequently.⁴

Acreage acquired for the project was to be managed to provide for collateral uses, including fish and wildlife, recreation, crops, pasture and forestry. The lower leasing limit, except for recreational purposes, was at elevation 362. All land below this elevation, a total of about 9,500 acres, would be flooded frequently. Land above elevation 362, although subject to occasional flooding due to the operation of the reservoir, except at the highest elevations, would be available for leasing. Of the 35,092 acres available for leasing, about 25,000 acres could be leased for agricultural and recreational purposes. Land not leased would be primarily in timber or idle because it would be inaccessible.

LAND ACQUISITION

Appraisal of the real estate to be purchased was the first step in acquiring land for the Wappapello Reservoir. The United States Department of Agricul-

³Elevations expressed in feet above mean Gulf level.

⁴Refers to flooding above spillway crest elevation 395 as a result of backwater or supercharge.

ture under contract with the Corps of Engineers began this work in 1936. The purpose was to determine the market value (price set by willing buyer and willing seller) of real estate as a basis for negotiations with owners.

Method of Acquisition

Soon after plans for a reservoir were announced in 1937, land buying started. In negotiating, the policy of the Corps was not to make an offer but rather to ask the owner how much he wanted for the land. The appraised value was held confidential. If the owner's asking price was much above the appraised market value, the Corps refused the offer. If the owner offered to sell at approximately the appraised market value, the Corps accepted. If his asking price happened to fall below the appraised value, the Corps also accepted. In those cases where no agreement could be reached, the government acquired the land through condemnation.

Six hundred and sixty tracts of land were acquired for the Wappapello Reservoir. Of these, 498, or 75 percent, were offered by the owners, after negotiation, at a price acceptable to the Corps. The remaining 162 tracts, or 25 percent, were condemned by the government so that settlement could be made through the court. Of the 162 tracts condemned for value purposes, 117, or 72 percent, were settled by agreement without court trial and 45 or 28 percent by trial or agreement after trial.

Settlements through the court were handled by the Department of Justice. The court appointed three appraisers to determine the market value of the land. One was chosen from a list submitted by the Corps of Engineers, another from a list submitted by the owners, and a third was chosen by the court. The appraisers for the court were instructed to arrive at the market value for each tract of land condemned. The owners and the Corps of Engineers also presented such evidence on value as they considered important.

Compensation Received

Of the 498 tracts offered after negotiation, at a price acceptable to the Army Corps of Engineers, 419 were acquired at or above the appraised market value, and 79 tracts below the appraised market value. The average price paid for the 419 tracts was 105 percent of the appraised market value. The price paid for the 79 tracts was 93 percent of the appraised market value (Table 3). The price paid for the 117 tracts condemned but settled by agreement without trial averaged 116 percent of the appraised market value. Payment for the 45 tracts condemned and settled by trial or agreement after trial averaged 144 percent of the appraised market value.

Costs for Which No Compensation Was Received

Displaced persons at Wappapello had to bear several costs for which they received no compensation. Owner-operators and tenants as well as city residents

TABLE 3--COMPARISON OF PRICE PAID WITH THE APPRAISED MARKET VALUE, WAPPAPELLO RESERVOIR LAND^{1/}

Method of Acquisition	Number of Tracts	Appraised Market Value	Price Paid	Price Paid as Percent of Appraised Value
		Dollars	Dollars	Percent
Optioned below appraised value	79	160,627	149,540	93
Optioned at or above appraised value	419	930,892	979,225	105
Condemned but settled by agreement without trial	117	358,522	416,229	116
Condemned and settled by trial or agreement after trial	45	207,357	299,192	144
Total	660	1,657,398	1,844,186	111

^{1/} Appraised market value as determined for the Corps of Engineers, not the appraised market value determined by the independent court appraisal.

and business men had to bear the cost of relocating and moving. Most farmers looked from two or three weeks to three months before they found another acceptable farm. According to report, however, in one extreme case a farmer spent \$2,000 looking for a farm comparable to the one he had given up.

Not considering time lost, the cost of moving ranged from \$50 to more than \$400. The cost to one owner of a business was more than \$700 to move his equipment.

Those who purchased other property had the usual expense of appraisals, financing charges and related costs. In most instances relocation also involved adjustment of inventories of livestock and machinery, sometimes at a sacrifice. In a few cases, relocation involved a shift in type of farming and a loss from the point of view of experience. Whatever reputation a farmer had in his community was forfeited when he located in a new community. The business and professional men experienced somewhat related problems in establishing in a new area.

Delays in Payments

In a study of sample tracts acquired in the purchase area, it was found that from 14 to 46 months elapsed between the appraisal and the date of option (Table 4). Even though one-half of the options were accepted within three months, others took nearly a year. In half of the cases, more than a year passed from the time the option was accepted by the government before the owner was paid. A few owners were not paid until about six months after they received notice to vacate. Although notice to vacate was given in these cases, it was understood from the Corps of Engineers at Memphis that the owners were not

TABLE 4--TIME LAPSE BETWEEN STEPS IN DIRECT PURCHASE OF A RANDOM SAMPLE OF PROPERTIES
IN WAPPAPELLO RESERVOIR PURCHASE AREA

Tract Designation	From Date of Appraisal to Date of Option	From Date of Option to Notice of Acceptance of Option	From Acceptance of Option to Date of Payment	From Date of Option to Date of Payment	From Date of Appraisal to Date of Payment
	Months	Months	Months	Months	Months
A	28	3	11	14	42
B	46	3	4	7	53
C	42	3	8	11	53
D	27	3	13	16	43
E	43	4	2	6	49
F	36	3	11	14	50
G	44	3	5	8	52
H	43	6	4	10	53
I	28	3	13	16	44
J	29	5	13	18	47
K	16	10	19	29	45
L	14	9	22	31	45
M	18	11	16	27	45

Source: Data supplied by Army Engineers, Memphis District Office.

actually required to move.

Payment was often a very slow process because it took time to clear faulty titles. The courthouse in Wayne County had burned twice, destroying many records. Much property had been owned by the same families for several generations and transfers had been informal. Since deeds had been lost and signatures neglected, ownership was accepted as a matter of fact. Over 12 percent of the tracts had to be condemned to clear faulty titles. Nearly one-fourth of the tracts were condemned for value purposes using an "Order of Immediate Possession" which did not allow the court to make advances to the owner pending settlement of value. The need for condemnation and the particular legal instrument used delayed payments and prevented advances. Another reason for delayed payment seems to be that an efficient routine for land acquisition had not been established when the land for the Wappapello Reservoir was acquired.

Owner Reaction to Acquisition Procedure

From interviews with local people it was apparent that the negotiations for purchase of land were rather unsatisfactory. Some who signed options did not realize that the option was an offer by the owner to sell at a certain price and that it did not become a contract for the government to buy at that price until approved and signed by an authorized official of government. The method of negotiating for purchase made many local people feel that the government was trying to buy their land for less than it was worth.

In the Wappapello Reservoir area the government used the legal instrument "Order for Immediate Possession." This provision in the Rivers and Harbors Act which permits immediate possession does not require that any funds be deposited with the court nor does it allow funds to be advanced to the owner if any are deposited. This statute is weak in that it unnecessarily deprives the owner of the use of his capital for some time. An alternative would have been to take the land through a "Declaration of Taking." In this event the government would have been required to deposit the equivalent of the appraised value with the court, and the court, if it so desired, could have made an advance to the owner pending final determination of value. Advances could have been made in all cases of clear title.

The distance of travel necessary to attend court presented a serious problem to land owners in connection with condemnation procedure. Court was held at Cape Girardeau, about one hundred miles from the Wappapello reservoir. This made it costly to the owners to bring their witnesses to court. Often the court was unable to take up the cases as scheduled, in which event another trip was necessary. If Federal court could have been held in the reservoir area, local people would have found the procedure much more satisfactory.

Acquiring land for a reservoir creates many problems of evaluation. They include such factors as accurate determination of the selling price of real estate, damages that should be paid for disturbance, the cost to the person whose prop-

erty is taken of acquiring comparable property in another location, the expense of moving out of the area, loss of income while moving and the cost of getting re-established in a new location.

Most people interviewed were satisfied with the price they received for their land. Some said they were not satisfied, but gave an option acceptable to the government because they did not wish to go to court. Families with little education were reluctant to go to court even though they felt they were not getting the full value of their property. More people were dissatisfied with the methods used than with the settlement.

Some families had misconceptions as to what they should be paid for their land. Some did not wish to sell at a fair market value at a time when values were near the lowest depression level even if they could have purchased comparable property with the payment. Others reckoned values in terms of what they had paid for their land. Some reckoned values on the basis of sentiment. The negotiations for purchase did not include a discussion of method of appraisal nor any details of the appraisal. Such discussion probably would have made it easier to come to some agreement with the owner.

Since relocation costs arise out of forced moves, there is a need for Federal legislation to provide compensation for disturbance, the expenses of moving, the cost of getting re-established and for similar items. Some standards for compensation need to be set to avoid abuses.

It was apparent from local interviews that the delay or uncertainty over payment worked a hardship on local people. For a part of the delay period, the owner did not know how much he would be paid for his land, and after he knew his option was accepted, he did not know when he would be paid. Since this made it difficult to plan ahead, most of the owners could not buy other property or move out of the area. Some sold feed or livestock to obtain funds to purchase other property or to move out of the area. Delays in payment caused discontent among local people, real estate agents and bankers.

It was fortunate for the displaced that land values were rising only slowly during this period; otherwise, owners would have had to pay much more for comparable property by the time they received payment for their land (Table 5). Despite this stability, about one-third of those interviewed felt that they were affected some by the rise in land values between the time of appraisal and time of payment. Hardships caused by delays in payment could have been partially overcome by the use of the legal instrument "Declaration of Taking." The court could have awarded the owner almost immediately sufficient funds for a down payment on a farm of comparable value.

Another factor not considered was the unique land market situation. In the immediate area of the Wappapello Reservoir the supply of land was reduced by acquisition of 660 tracts and the demand was increased. It is true that former landowners may have sought other forms of investment. In addition, it may be that some used their investment for consumption purposes. Data for this study

TABLE 5--INDEX OF LAND VALUES IN MISSOURI (1912-14 = 100)

Year	Index of Land Values
1936	60
1937	60
1938	60
1939	58
1940	59
1941	60
1942	66
1943	74
1944	82
1945	91
1946	102
1947	113
1948	116

Source: The Farm Real Estate Situation, United States Department of Agriculture.

indicated that nearly 50 percent of the 402 farm families in the area in 1940 were classified as farmers in 1948. However, even though not all of the displaced persons were potential buyers, the market situation was altered.

The basis for compensating an owner for his farm should be the current market value of comparable land. If the number who are to be displaced becomes significant, then the current market value should be adjusted upward to take into consideration the change in the land market situation. To this revised value can be added compensation for disturbance and costs of relocation.

RURAL ADJUSTMENTS

The development of the Wappapello Dam and Reservoir necessitated adjustment in human, land, and capital resources. Farm families were forced to relocate their base of operations. Business and village residents were required to move their homes and businesses. Institutions such as county governments, schools, and others were required to make adjustments.

Farm Family Adjustments

There were 402 families living in the purchase area of the Wappapello Reservoir when the government began to acquire land in 1937. That included those families living in the towns of Chaonia and Taskee and includes Greenville which at that time had a population of over 500 persons. By late 1948, 308 of these 402 families had moved out of the purchase area.

The other 94 families were still residing in the purchase area at the time of the study. Some of the land purchased by the government was subject to inundation only in extreme flood conditions. Although this land was subject to some risk of crop damage, it could be leased for farming. Since former owners and heirs were given preferential leases, many of these 94 chose to remain in the area.

Of the 308 families who moved out of the reservoir area after the government began to acquire land, 265 remained in Missouri, 28 moved to other states, and the location of the remaining 15 was unknown (Table 6). About 40 percent of the 265 farm families who moved but remained in Missouri had located in Butler County, the county immediately south of the reservoir. One-third had become relocated in other parts of the state; no county or city received any large number.

Only about two-fifths of the families who moved were still farm families in 1948. About one-third went into other occupations, one-sixth were retired or disabled, and the occupations of the others were unknown or the persons had died.

The change from farming into other occupations or the retirement by three-fifths of the farm families was probably brought about by a number of circumstances. Having to move gave many people the opportunity to change occupations or retire, although this adjustment may have been more rapid than normal. The building of the dam provided employment which attracted many farmers. When the dam was completed there were jobs in war industries. Because the average age of farmers in 1940 in Wayne County was 50 years, many of the operators were rather old to become re-established. This fact may partly explain the large number who retired or relied on relief benefits.

Another factor was the problem of obtaining another farm. The mass movement increased the demand for farms. Some were unable to find the farm they wanted and took other jobs in order to have more time. Many of these stayed in other work.

The delay before owners were paid for their farms, even though most families knew they would have to move, caused some to seek other employment because they could not immediately finance the purchase of a new farm.

Change in Type of Farming

Farmers who moved out of the reservoir area but continued to live in Wayne County made few changes in their enterprises. They continued to operate grain and livestock farms, using free range where they could.

Most farmers who moved to other counties did have to make adjustments in type of farming. The enterprises usually found on farms in Stoddard and Butler counties differed measurably from those of Wayne County. Since those two counties had mostly bottom land, much of it was in cotton and soybeans because these had been the most profitable crops. Because free range was not permitted, less livestock was produced. Farmers who moved to these counties had fewer acres of cropland; consequently, they produced less corn and hay, grew more cotton and soybeans, and kept a smaller number of livestock (Tables 7 to 10).

TABLE 6--FARM FAMILIES OF THE WAPPAPELLO RESERVOIR IN 1940, CLASSIFIED BY COUNTY OR STATE OF RESIDENCE AND OCCUPATION OF HEAD OF FAMILY

Residence in 1948	Occupation in 1948											
	Totals		Farm Operators		Other Occupations		Retired or Disabled		Unknown		Dead	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Moved from reservoir to other locations in Missouri												
To other parts of Wayne County	89	22	33	17	30	25	24	41	1	5	1	7
To Butler County	110	27	60	32	29	25	18	31	2	9	1	7
To St. Louis County	18	4	0	0	16	14	0	0	1	5	0	0
To Stoddard County	13	3	6	3	3	2	2	3	2	9	0	0
To 18 other counties	35	9	20	11	12	10	2	3	1	4	0	0
Total	<u>265</u>	<u>66</u>	<u>119</u>	<u>63</u>	<u>90</u>	<u>76</u>	<u>46</u>	<u>78</u>	<u>7</u>	<u>32</u>	<u>2</u>	<u>14</u>
To other states	28	7	2	1	13	11	4	7	8	36	1	7
Unknown	15	4	0	0	0	0	0	0	4	18	11	79
Total	<u>308</u>	<u>77</u>	<u>121</u>	<u>64</u>	<u>103</u>	<u>87</u>	<u>50</u>	<u>85</u>	<u>19</u>	<u>86</u>	<u>14</u>	<u>100</u>
Remained in reservoir	94	23	67	36	15	13	9	15	3	14	0	0
Total	<u>402</u>	<u>100</u>	<u>188</u>	<u>100</u>	<u>118</u>	<u>100</u>	<u>59</u>	<u>100</u>	<u>22</u>	<u>100</u>	<u>14</u>	<u>100</u>

Source: Information obtained from acquaintances, friends and relations of the families concerned.

TABLE 7--TWENTY-SIX FARM OPERATORS WHO MOVED FROM THE WAPPAPELLO RESERVOIR, CLASSIFIED BY NUMBER AND USE OF ACRES OPERATED IN THE AREA IN 1940, AND OUT OF THE AREA IN 1948 ^{1/}

Number of Acres	Farmers Reporting							
	Cropland Acreage				Corn Acreage			
	In Area		Out of Area		In Area		Out of Area	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Total	26	100	26	100	26	100	26	100
Under 20 acres	1	4	0	0	7	27	14	54
20-59	7	27	11	42	15	58	8	31
60-99	12	46	8	31	3	11	4	15
100 or more acres	6	23	7	27	1	4	0	0
	Hay Acreage				Pasture Acreage			
Total	26	100	26	100	26	100	26	100
No acres	2	8	4	15	10	38	7	27
Under 15 acres	7	27	7	27	9	35	8	31
15-29 acres	7	27	6	23	5	19	7	27
30 or more acres	10	38	9	35	2	8	4	15

^{1/} A sample of approximately 25 percent of families involved.

TABLE 8--TWENTY-SIX FARM OPERATORS WHO MOVED FROM THE WAPPAPELLO RESERVOIR, CLASSIFIED BY CHANGE IN NUMBER AND USE OF ACRES OPERATED IN THE AREA IN 1940, AND OUT OF THE AREA IN 1948

Change in Number	Farmers Reporting Use of Acreage							
	Cropland		Corn		Hay		Pasture	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Total	26	100	26	100	26	100	26	100
Gained (sub-total)	11	42	6	23	8	31	13	50
20 or more acres	10	38	3	12	4	16	3	12
5 - 19 acres	1	4	3	11	4	15	10	38
Changed less than 5 acres	0	0	4	15	7	27	8	31
Lost (sub-total)	15	58	16	62	11	42	5	19
5 - 19 acres	6	23	10	39	6	23	5	19
20 or more acres	9	35	6	23	5	19	0	0

TABLE 9--TWENTY-FIVE FARM OPERATORS WHO MOVED FROM THE WAPPAPELLO RESERVOIR CLASSIFIED BY EXTENT OF CHANGE IN CROP AND PASTURE PRACTICES BY 1948

	Farmers Reporting Production or Use of							
	Cotton		Soybeans		Small Grain		Open Range	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Total	25	100	25	100	25	100	25	100
Began or increased use	9	36	4	16	8	32	0	0
Ended use	9 ^{1/}	36	0	0	3	12	12	48
No significant change	7	28	21	84	14	56	13	52

^{1/} 9 or 36 percent of the farmers moved into non-cotton producing areas.

TABLE 10--TWENTY-FIVE OPERATORS WHO MOVED FROM THE WAPPAPELLO RESERVOIR, CLASSIFIED BY NUMBER OF CATTLE AND SOWS KEPT AND NUMBER OF CALVES AND PIGS SOLD IN AREA IN 1940, AND OUT OF AREA IN 1948

Number of Cattle	Farmers Reporting Cattle Kept				Number of Sows	Farmers Reporting Sows Kept			
	In Area		Out of Area			In Area		Out of Area	
	No.	Pct.	No.	Pct.		No.	Pct.	No.	Pct.
Total	25	100	25	100	Total	25	100	25	100
Under 5 head	1	4	9	36	None	0	0	6	24
5 - 9 head	4	16	8	32	1 - 2 sows	5	20	16	64
10 - 19 head	8	32	6	24	3 - 4 sows	10	40	2	8
20 - 39 head	6	24	2	8	5 - 9 sows	6	24	1	4
40 or more	6	24	0	0	10 or more	4	16	0	0
<u>Calves</u>					<u>Pigs</u>				
Total	25	100	25	100	Total	25	100	25	100
None	0	0	2	8	No pigs	0	0	4	16
Under 5	5	20	14	56	Under 30	7	28	14	56
5 - 9 calves	7	28	6	24	30 - 49 pigs	9	36	6	24
10 - 19 calves	9	36	3	12	50 or more	9	36	1	4
20 or more	4	16	0	0					

It took considerable time for Wayne County farmers to learn how to farm the wet flat land in Butler and Stoddard counties. They had to learn to produce new crops. Whether the farmers who moved made more money or less than they would have made had they been able to remain at Wappapello is not known. Over a period of time farmers will adjust to new conditions, but they may lose money while they are becoming familiar with the new conditions. The greater the change in farming methods, the greater the chance of loss the first few years of operation.

On the basis of a study made in late 1948, it is estimated that about two-thirds of the farmers selected farms wisely. They had found the kind of farm they wanted and located in a community where the family became satisfactorily established.

Management of Resources in the Reservoir Area

Reservoir land was first leased in 1940, and from 1940 to 1942, one-year leases were granted for both crop and pasture uses. Beginning in 1942 the term of lease was increased to five years and, in addition to crops and pasture, tracts were leased for commercial purposes. Recreational leases as such, were not issued until 1947.

The government lease form. The lease used at Wappapello was designed for river and harbor or flood control property. The essential features are contained in the Act of Congress approved August 5, 1947.⁵ The maximum term

⁵An Act to Authorize Leases of Real or Personal Property by the War and Navy Department and for Other Purposes (61 Stat. 774, Statutes at Large).

could not exceed five years except as the Secretary of the Army found it in the public interest to make it longer. The lease could be terminated by the lessee at any time by giving the Army at least ten days' notice in writing. The lease, however, was revocable at will by the Army. The lessee was obligated to maintain at his own expense all improvements including terraces and other soil and water conservation structures used on the land. He was expected to adopt approved farm management and soil conservation practices. Many of the usual obligations of the private landlord were not assumed by the government. In addition, the government was not responsible for damages to property or injury to persons resulting from any governmental activity.

Methods of awarding leases. Three methods of awarding leases were used in leasing Wappapello Reservoir land, the preferential, the advertised, and the negotiated. Before any land was leased, however, the amount of rent offered had to equal or exceed the appraised rental value. This was estimated to be 2 percent of the purchase price when the program was started but the rate had since been increased.

Preferential leases were offered to the owners from whom the property was acquired, or to owners or lessees of adjoining property. The rent was generally the amount offered by the former owner provided that it was at least equal to the minimum required. Land not leased on a preferential basis was publicly advertised. Sealed bids, accompanied by a certified check covering 10 percent of the bid, had to be submitted by persons interested. The highest bidder was awarded the lease provided his bid was at least equal to the minimum. If there were no satisfactory bids, those who sent in nonacceptable bids could raise their first offer and other individuals could submit bids. Leases awarded in this manner were negotiated leases.

Land Leased. In 1948 there were about 300 tracts available for lease. Of this number, 290 had been leased one time or more up to October, 1948. Of the 290 leases, 278 were for some agricultural purpose other than a combination of agriculture and commercial or recreational purpose (Table 11).

TABLE 11--TYPE OF LEASE, WAPPAPELLO RESERVOIR, 1948

Type of Lease	Number
Agricultural	16
Agriculture and pasture	256
Agriculture and residence	1
Agriculture, pasture and residence	4
Agriculture, pasture and commercial	3
Agriculture, commercial and recreational	1
Pasture	1
Pasture and recreation	3
Residential	1
Commercial	1
Other	3
Total ^{1/}	290

^{1/} Does not include those that have never been leased.

Source: Data supplied by District Engineer, Memphis.

TABLE 12--COMPARISON OF TYPE OF AGRICULTURAL LEASE GRANTED IN THE FIRST CONTRACT AND LAST CONTRACT FOR ALL TRACTS LEASED IN THE WAPPAPELLO RESERVOIR AREA

Type of Lease	Lease Under First Contract		Lease Under Last Contract	
	Number	Percent	Number	Percent
Preferential	146	53	107	39
Negotiated	68	24	90	32
Advertised	64	23	81	29
Total	278	100	278	100

Source: Data supplied by District Engineer, Memphis.

During the first year the majority of leases were preferential but the proportion had decreased (Table 12). Dissatisfaction with the government as landlord, more desirable opportunities elsewhere, death, and cancellation had reduced the number. A few preferential leases had been revoked by the government for failure to use the land in accordance with the provisions of the lease. Many of the leases had not been held for the duration of the five year term (Table 13).

TABLE 13--THE NUMBER OF AGRICULTURAL LEASES WRITTEN FOR A SPECIFIED TERM AND THE LENGTH OF TIME THE LEASES WERE ACTUALLY HELD FROM THE TIME LEASING OF LAND WAS INITIATED UNTIL OCTOBER 1948

Number of Leases Written for a Specified Term		Length of Time Leases were Actually Held	
Specified Term in Months	Number	Length of Time Held in Months	Number
12 or less	112	12 or less	138
13 to 24	16	13 to 24	32
25 to 36	9	25 to 36	53
37 to 48	17	37 to 48	25
49 to 60	362	49 to 60	94
Over 60 ^{1/}	74	Over 60	3
		Still in force	245 ^{2/}
Total	590	Total	590

^{1/} For the most part this group represents the preferential leases which have been renewed with no changes in the terms of the contract.

^{2/} Of the 245 still in force during October 1948, five were for a specified term of 12 months or less, thirteen were for 13 to 24 months, 174 were for 49 to 60 months and 53 were for 61 months.

Size of tracts leased. Tracts offered for lease were the identical tracts purchased, ranging in size from one acre to over 1,000 acres. Many of the tracts were small, irregular or inaccessible because many tracts purchased were parts of farms, part-time farms or inadequately sized farms. Since the tracts were not consolidated before being leased, 30 percent of those available for agricultural purposes were less than 40 acres in size and over 70 percent were less than 120 acres

TABLE 14--SIZE OF TRACTS LEASED FOR AGRICULTURAL PURPOSES,
WAPPAPELLO RESERVOIR, 1948

Acres	Number of Tracts	Percent of Total
0 - 9	18	6
10 - 19	23	8
20 - 39	44	16
40 - 59	35	13
60 - 79	29	10
80 - 119	55	20
120 - 159	30	11
160 - 199	17	6
200 - 239	5	2
240 - 279	5	2
280 - 319	8	3
320 & over	9	3
Total	278	100

(Table 14). Only 16 percent had 160 acres or more.

In the fall of 1948 there were ninety-two tracts advertised, the majority of which had been offered before but received no satisfactory bid. About 25 percent had no crop land and over half had less than forty acres of crop land. Some tracts were in sections not readily accessible and many lacked adequate fencing necessary for crop production under open range conditions.

In 1948, 223 operators farmed the 267 tracts leased for agricultural or pasture purposes. More than half the operators leased less than 100 acres of reservoir land and about one-fourth leased less than 40 acres (Table 15). Only 13 percent of the operators leased more than 200 acres, but this group leased about 60

TABLE 15--ACREAGE LEASED BY OPERATORS OF AGRICULTURAL LAND,
WAPPAPELLO RESERVOIR, OCTOBER 1948

Acres	Number of Operators	Percent of Total
0 - 9	12	5
10 - 19	21	10
20 - 39	26	12
40 - 59	27	12
60 - 79	20	9
80 - 119	43	19
120 - 159	29	13
160 - 199	16	7
200 - 239	5	2
240 - 279	5	2
280 - 319	8	4
320 & over	11	5
Total	223	100

Source: Data supplied by District Engineer, Memphis.

percent of the reservoir land. More than 90 percent of the operators leased only one tract from the government, but half of the operators who leased from the government also operated privately owned land near the reservoir (Table 16). Many enlarged their farms by leasing land from the government. Considerable uncertainty resulted from this method. Separate bids had to be submitted for each tract and it was difficult for an operator to be the successful bidder on the exact acreage he needed or wanted.

TABLE 16--NUMBER OF TRACTS LEASED BY OPERATORS OF AGRICULTURAL LAND, WAPPAPELLO RESERVOIR, OCTOBER 1948

Number of Tracts	Number of Operators	Percent of Total
1	205	91.9
2	3	1.3
3	10	4.4
4	2	.9
5	1	.5
6	1	.5
7	1	.5
Total	223	100.0

Source: Data supplied by District Engineer, Memphis.

Sub-leasing. The government prohibited sub-leasing except by written permission. Some operators preferred to sub-lease rather than hire the extra labor needed to farm all the land leased. A few who held preferential leases had sub-leased. Sub-leasing also occurred when there were unused sets of buildings or garden patches on a leased tract. The requirement of written permission seemed unnecessary and troublesome to some operators, especially when the amounts were small or the time short.

There was a question whether holders of preferential leases should be permitted to sub-lease. Preferential leases were being granted largely so former owners could continue to operate in the area if they desired. If they preferred to stay, the preferential lease tended to keep at a minimum the number of local people forced to move. If the former owner preferred to live or farm elsewhere, he had little need for a preferential lease. There existed considerable disparity between the low-rentals the preferential lessee paid and the large returns he had received through share renting without any reinvestment in repairs or improvements for the sub-lessee. The sub-lessee was frequently poorly housed because of the deterioration of buildings.

Types of operators leasing land. Operators in various sections of the Wappapello reservoir area, aside from the influence of the sealed-bid and short-term lease, were determined by the size and accessibility of the tracts and the degree of risk. Three situations seemed to prevail:

Small isolated tracts and those located in the high risk area, with houses and other improvements, were operated by part-time or subsistence farmers. Families unable because of health or age to manage an adequate family farm unit

infiltrated into the purchase area. The low rental made it possible for them to spread their social assistance funds further than they could by living in town. Two of 20 farmers interviewed were getting more income from Aid to Dependent Children than from farming. Since the children in the area were such a distance from their social workers that contact was infrequent, the social worker had little influence in keeping the children in school. Usually they dropped out of school at an early age because of the lack of encouragement, the lack of transportation and inadequate clothing.

The larger tracts and those subject to some flooding as a direct result of the dam were operated for the most part by full-time commercial farmers. Most of these farmers lived on land they owned on the edge of the reservoir. To farm these tracts properly, subject to greater risk, the operator had to own farm machinery which could cover the ground rapidly. The timing of the farming operations was important, particularly in harvesting the crops. This required ownership of a large amount of machinery and equipment.

In the upper reaches of the reservoir there was little or no flooding as a direct result of the dam. In this area farming more nearly conformed to the family farm pattern that existed on the bottom land before the reservoir was built and in other bottom land sections of the county. The major deterring factor here was a lack of maintenance and repairs of the houses and farm improvements.

Land Use

The land in the Wappapello Reservoir, except for that in the permanent pool or only slightly above, was being used about as it was before the dam was built. Practically all of the desirable bottom land was used for grain crops, and the cleared upland was used for meadow and pasture. Corn was the important crop because it produced the largest amount of feed per acre, was easily grown, and the time of planting could be adjusted according to water conditions. Some bottom land along with cleared upland formerly used for grain crops was later used for meadow and pasture.

A few special problems evolved from the reservoir. Some idle land suitable for pasture was becoming overgrown by willows and other trees. On the other hand, trees were becoming re-established on the cleared land in some of the valleys and coves. In several places the bottom land had been scoured by torrential floods. Most of these places occurred in the upper end of the reservoir, where stream channels had become clogged with trees and gravel. This problem will become even more serious. Removing obstructions from channels, building rock dams at danger points and maintaining tree-lined stream banks may be necessary as remedial measures.

Soil erosion did not seem to be a significant problem in the reservoir area. If the cleared upland continues to be used for meadow or pastures, for which it is primarily suited, erosion will be slight and no protective measures should be required.

Maintenance of Buildings

There were a number of buildings at high elevations in the rented reservoir area. During the 8 to 10 year period in which the government had leased land with buildings and other improvements, there had been no regular program for maintenance of improvements, and buildings had deteriorated. Some of the rented houses had leaky roofs, others needed window panes, many needed other repairs and all needed paint. Almost all the other buildings and fences needed repair.

The lessee had not been permitted to make additions or to repair the improvements without written permission. The new lease form used for the first time in the fall of 1948 provided that the tenant was responsible for keeping the buildings and improvements in as good a state of repair as when he assumed the lease. Farm families who lived on the edge of the area and rented additional land from the government generally lived in their own homes. They kept their own houses in relatively good repair. Since many did not use the buildings on the tracts rented, they made no attempt to maintain them.

The families of the Wappapello area were able, to some extent, to raise their level of living. Families who lived around the outside of the reservoir and rented land from the government in addition to what they controlled were able to raise their level more than those who lived within the reservoir and were entirely dependent upon government land.

Making Necessary Readjustments

The attitudes of rural people are important in understanding their problems of adjustment. Some of the attitudes of the people at Wappapello may have been formulated on the basis of misinformation, rumor, and prejudices. Others seemed to rest firmly on facts. People had difficulty understanding the methods of the Corps of Engineers. This did not exist equally among all people or with respect to all phases of the work. In many instances the people understood full well the reasons for certain procedures and were able to plan accordingly. But in other instances lack of understanding was so great that some persons reported that open conflict would have been no surprise to them. Part of the difficulty stems from the fact that rural people are accustomed to informal discussion before deciding upon a course of action. Written documents only legalize or formalize this oral discourse. Rural people rely on their own folk-ways as accepted ways of action. Some understand only poorly the operation of the courts in administering laws.

Rural people have their own specified set of values which may differ from those of urban societies. They build their status more on their friends, their length of residence in the community, their character, and other non-monetary elements. Therefore, many of the values held by rural people cannot be compensated for with money alone. Destroying these values by the government, without recognizing their meaning to the local people, caused discontent with

the government program. Representatives of government should have taken greater pains to acquaint themselves with local situations.

Confusion over the plans. One of the greatest problems that the people had was securing authentic information about their status with respect to the flood control program. If the people could have been adequately informed, many of the problems and unfavorable attitudes would have disappeared. In the absence of authentic information, rumors spread rapidly. It seems safe to say that nothing would have done more to help people in their adjustment than a well developed educational program designed to answer the questions that were continually perplexing them.

The government started surveys in the area as early as 1916, but little if any attempt was made to inform the population as to the meaning of this activity until 1937. In the meantime, the people had developed their own ideas as to what was being done. It was hard for them to discard these ideas even for authentic information.

This difficulty of securing information was so great that many people concluded that the Army was operating a secret program such as it might in case of war. Many concluded that the government was concerned only for the people below the dam, and that it held only contempt for people in the basin above the dam because they were in the way of construction. As evidence, persons interviewed cited the fact that the first announcement of the dam and its purpose was held in Poplar Bluff, the trading center of the people below the dam, not of those above it, and that a committee had to request an announcement in Greenville, the county seat of Wayne County. They claimed that surveyors generally would not talk with them. One farmer said a surveyor working in his front yard would not exchange greetings with him even though the farmer greeted him first. Other farmers said that government representatives, trying to secure an option, gave only a minimum of information, and when the interview ended they did not know what their status was or what their next step should be.

One committee reported that a trip to Memphis for a conference with one of the officials resulted in little more than aides and secretaries bringing them one technical report after another. The conclusion reached was that the official was attempting to impress them rather than give them information. On the other hand, another committee said that a colonel had sat down with them and talked things over just as though he was one of them.

Dissatisfaction with court procedures. Another problem the people faced was the use of the court as a means of getting a fair settlement for their land. They had had limited experience with the courts. The trials they had seen or had known about had involved stolen property or misdemeanors of one kind or another. They knew that court procedures involved hiring an attorney at high fees, and they also knew that cases often extended over long periods.

They apparently "feared the government" and its resources and many ac-

cepted a price they considered too low rather than go to court. Some of the persons interviewed believed that government agents held the possibility of condemnation procedures as a threat over the landowners in order to secure their signatures on options. They felt that little or no attempt was made to show how the courts offered the people an opportunity for presenting their cases before an impartial judge.

Many who took their cases to the courts were disappointed. They said they were treated as "the criminals" in the court cases they knew about. No doubt, they failed to see the similarity between all court cases. One of the local lawyers stated that the government attorneys handled the condemnation suits like criminal trials. This unfavorable attitude might have been prevented if farmers had been informed as to what procedures to expect in a court room, what these procedures meant, and how to meet them. Some explanation of the kind of people with whom they were dealing might have led the government lawyers to act more as though they were dealing with respected citizens rather than with dishonest, disgruntled people.

Neglect of community property. In the period of adjustment, that is, while displaced families sought new locations and those who remained accustomed themselves to the reservoir, the people gave little thought to community property. Other matters took up their attention. At the time of the study most of them felt action should have been taken to protect their neighborhood institutions. Some of the local leaders resented strongly the destruction and neglect of improvements.

Nearly all of the farm people interviewed were concerned over the disposition of cemeteries. Many of the families had lived in the area for two or three generations and had relatives buried in the community cemeteries. Some of the older persons had planned to be buried there alongside their relatives. Building the dam had isolated these areas, the people had moved out, the roads had not been maintained, and, in some instances, waters impounded during flood stages had killed the trees and the grass. Some cemeteries were still used by people who had moved out of the area, but it was difficult to keep the grounds protected and in shape.

The Corps of Engineers did not acquire the land occupied by these cemeteries. The land was held in community ownership, as before the building of the dam. The County Court appointed a committee of three local persons to work with the War Department to find a solution to the problem. Some of the members of this committee reported that they had met with representatives of the government two or three times, and each had been told that they had no instructions but were sure the government would "do the right thing" or "treat us fair." The committee members said that this was as much as they had been able to accomplish.

Competition for leases. The sealed bid as a procedure in obtaining a lease was an entirely new experience for farmers at Wappapello. They had been fami-

lize with oral bargaining processes. Few long term leases had been used but it was rather common for landlords and tenants to have an understanding that as long as the tenant did acceptable farming he could continue to rent the farm. There was no such understanding under the government lease. A lessee might be a good farmer and the government might wish to award him a new contract. But if the government, received a bid from a less desirable lessee, which was only slightly higher, the new lease would have to be awarded to the highest bidder. In the fall of 1948 a lessee who deserved a renewal of his contract lost it to another operator who bid \$2.00 more. Another lessee lost the tract on which he was living because he was outbid by \$3.75. That a farmer should have to bear the cost of moving, with only a cash gain of \$3.75 to the government and a possible loss much larger than this because of less desirable lessee causing soil deterioration and loss in value of improvements, did not seem to be in the public interest. There was also some evidence that bidders were not always able to keep bids secret. Such conditions created animosities among families in the neighborhood.

Sealed bids were apparently used with the idea that they would keep rental rates for government land in line with those for privately owned land. But the rental rate should be only one of several considerations. The character and ability of the tenant and the operating capital he has also are important. Private landlords are able to consider this in selecting tenants. By using sealed bids and awarding leases to the highest bidder the government was unable to give consideration to factors other than rental rates. It would seem advisable that the government negotiate with lessees and award contracts by including considerations in addition to the amount of rent.

Improvements in land management. As soon as possible after acquisition, all land in the reservoir above the permanent pool should be classified as to its best use. This should be done by persons qualified to classify land. Land purchased to avoid excessive severance damage but not needed for reservoir purposes in general should be resold or retained for some other public purpose, depending on its best use. This procedure would reduce the acreage of reservoir land to be managed, but it is essential to explain to local people why this step seems to be desirable.

The number of farm buildings retained on reservoir land should be kept at a minimum. Only those should remain which are serviceable, readily accessible to adequate roads and schools, and necessary for the proper leasing problems which have already been discussed.

It may be desirable for the government to accept the most favorable bid when purchasing supplies or awarding contracts, but the competitive sealed-bid method seems poorly adapted for the leasing of agricultural land. The person in charge of land management should have the authority to negotiate agricultural leases. Problems can arise in connection with negotiated leases. The unsuccessful applicant may feel that favoritism has been practiced. A safeguard against this

criticism would be to award leases with the help of an advisory committee of local farmers. A committee of this kind might be effective in keeping rental rates in line with those prevailing in the surrounding area. The majority of farmers on the committee should not be farmers leasing land from the government.

Operators on the land at the time of acquisition should have first choice in leasing the land if they prefer to do so and are considered to be capable farmers. Lessees should be assured that their leases will be renewed so long as they live up to the terms of their contracts. The farmers leasing reservoir land at Wappapello have a feeling of insecurity, resulting largely from their experience in leasing reservoir land. In case of forest land, or some other resource in the reservoir area, competent supervision or management should be provided.

Need for coordination of policies designed to attain common goals. In general, displaced persons did not receive compensation for the total cost of becoming re-established. Even if they had received full compensation, the re-establishment of some families on comparable farms would have meant the obvious perpetuation of a situation of inadequate resource combination. Such a development is contrary to the objectives of the basic project and is undesirable from a social as well as an economic point of view. It would seem that if maximization of social product over time is a worthy goal for use of natural resources in a watershed area, it is likewise a worthy goal for the people who are displaced.

Using public funds for flood control is only one of many programs which have been adopted in an effort to attain one or both of our master economic goals. For example, the Farmers' Home Administration was established to provide managerial and financial assistance to farm families on inadequate farms, but who possess characteristics needed for successful owner-operatorship. There should be close coordination of the many public programs designed to use all resources more efficiently.

If a flood control project displaces deserving farm families with inadequate land and capital resources, not only should they receive fair compensation for their costs of displacement but agencies such as the Farmers' Home Administration should aid such families in every way possible to re-establish themselves in a better situation. The Employment Security Division should make every effort to inform all of the people who are displaced on employment opportunities. This would help avoid perpetuating underemployment and low living standards.

Re-establishing underemployed farm families and laborers in improved situations would not necessarily directly cost the original project. They would not be included in the cost-benefit evaluation of the flood control project but Congress should assume the initiative to see that funds and facilities are made available through related programs.

Allowance for Individual Situation. Dealing with each family on an individual basis concerning its many problems is recognized as being next to impossible. Rules have to be made and procedures established to handle the work.

These, if properly drawn, take care of the majority of the cases. But, if blanket rules and regulations are followed rigidly, they put some families in unfortunate circumstances and cause hardships. Such blanket rules suggest that the government is not interested in the people. For the most satisfactory adjustment, some family situations must be handled as exceptions to the rules.

Small isolated groups on peninsulas above the purchase line that are cut off by the government acquired land are illustrative. The principal roads to these areas were served by the lake, and people living there had to construct their own roads. The properties decreased in value even though the land itself was above the flood line. In cases of this kind, the government needs to provide adequate safeguards that money paid for road relocation is used for this purpose. If productivity of the isolated area does not justify the expense of providing a road, the land should be purchased and zoned against habitation.

An illustration was that of a farmer who owned a small iron mine on his property which at times had added about \$250 to his annual family income. It was on the upland above the usual purchase line. He asked that the 11 acres upon which it was located be reserved; the Corps of Engineers agreed to do this. In the final settlement, however, the wrong 11 acres were reserved and at the time of this study the owner had been unable to correct the error.

URBAN ADJUSTMENTS

Development of the Wappapello Reservoir made it necessary for the people of Greenville to move. In trying to decide on a new townsite a difference of opinion as to the best location arose among the local residents. Each of two groups selected a site. One became the new town of Greenville and the other, the new town of Kailville.

Old Greenville

Residential establishments. Before the move, there were 130 homes in Greenville and six combined business and residential buildings. Seventy-seven of its 130 residences had been built before 1900. Ten homes had been built since 1920. Ninety-one of the 135 families owned their homes. Forty-four families lived in rented properties. There were three two-family homes in the town, and four pieces of residential property still unoccupied. Seventy-two percent of the residential properties in Greenville were purchased by the Federal Government for \$2,000 or less. Only 6 percent were purchased at a price exceeding \$3,000.

Business establishments. There were 20 pieces of business property and six pieces of combined business and residential property in old Greenville (Table 17). The sales of the retail establishments in Greenville in 1936 amounted to \$241,252 or 29 percent of the county total of \$825,330.⁶ By 1936 the planing mill, around which the town had grown, had not been operating for many years.

⁶Data computed from State sales tax collected, 1936.

TABLE 17--NUMBER AND KINDS OF BUSINESS FIRMS IN GREENVILLE, 1936

Kind	Number
Abstract office	1
Bank	1
Barber shops	2
Beauty Shop	1
Blacksmith shop	1
Carpenter shop	1
Dentist	1
Doctors	2
Drugstores	2
Filling stations	2
Flour mill	1
Garage	1
Garage and filling station combined	3
General stores	4
Grocery stores	2
Hardware and smithy	1
Hotel	1
Jewelry store	1
Lawyer	1
Lumber warehouse	1
Pool hall	1
Post office	1
Printing office	1
Restaurants	3
Style shop	1
Theater	1
Undertaker	1

The roller mill was still operating but was no longer milling flour. It was doing custom grinding for local farmers.

Churches and cemeteries. The Baptist, Christian and Methodist churches were active in Greenville in 1936, each owning its church building. The Methodist Church had a full-time pastor and held services regularly. Other churches held services one or two Sundays each month.

There were two cemeteries in old Greenville. One, situated on low land along the east bank of the St. Francis River, had not been used for many years. The cemetery where burials were made at the time the town was abandoned was located on higher ground above the center of town.

Public buildings and services. Greenville had a consolidated school, serving the surrounding rural area as well as the town. The total enrollment was 317 in 1939. This district maintained one of the four first-class high schools in the county. The high school drew a disproportionate number of its pupils from outside the district. In 1939, 114 of the 156 pupils enrolled in the high school

were non-residents of the district. The school building was practically new, having been built in 1934. The school was of particular importance to the town because it served as the center of community activities.

Wayne county had built a new courthouse in 1926. It was located on a terrace, sufficiently high to escape periodic flooding. It served as a place of refuge for the people when they were driven from their homes by flood water.

The roads and streets of Greenville compared with those in any Ozark town. They were gravelled, except for a few blocks in the business district which had at some time been treated with oil or asphalt. New sidewalks had been laid in the business area. The homes in the outlying parts of the town had either very old walks or no walks at all.

The Arkansas-Missouri Power Company provided electricity in the town. Street lights were installed in the late 1920's. Seventy-seven percent of the homes were wired for electricity.

The town of Greenville had no water supply or sewage disposal system. Water came from private wells. Only five of the 130 homes had inside plumbing. Telephone service was provide by the Doniphan Telephone Company.

Organizing to Move Greenville

Since the town of Greenville was located wholly within the Wappapello Reservoir area, it had to be vacated. From the first the citizens of Greenville were divided in their opinions of the dam and its influences on their fortunes. Some felt that the government would pay high prices for their property and so welcomed its construction. Others, who were content to remain in Greenville because of personal reasons, could not look favorably upon a project which would necessitate their moving.

Although dam construction began in 1938, many people were convinced that it would never be completed. However, by 1939, when it finally became evident that the dam was going to become a reality, the people in the old town of Greenville began to look about for new places to live. Some chose to move completely away from the area. Some selected homes in nearby localities. Others, in business, preferred to stay in or near the familiar area rather than attempt to start in places already served by existing establishments. Frequent public meetings were held to discuss the problem. A Citizen's Committee was formed which wrote to Governor Lloyd C. Stark for assistance.

Assistance from outside agencies. Governor Stark requested the Director of the State Planning Board to study the relocation of Greenville. At a meeting of the State Planning Board held April 19, 1939, the staff of the Planning Board was authorized to cooperate with the Citizens' Committee of Greenville in preparing a plan to relocate the town. The National Resources Committee then in existence was asked to assist by providing consultants. This request was granted.

Selecting a site. The Director of the State Planning Board, two consultants, and the local committee, inspected all of the desirable townsites in the vicinity.

They selected two locations for further study, the present site of Greenville and one nearer to the old town. The Memphis office of the Corps of Engineers furnished topographic maps of the two locations. Both sites were studied carefully; numerous layouts were made and, as a result, one was abandoned. At a mass meeting called for the purpose, the citizens of Greenville voted to accept the recommendations submitted by the consultants and the local committee. The Citizens' Committee then optioned the land for the new town site. The new site did not meet with the approval of all residents, and eventually the dissatisfied group selected a second site. This became Kailville.

Greenville Improvement Corporation. In order to manage and finance the building of the new town, a non-profit corporation was formed. It was capitalized for \$2,000. The money was raised by subscriptions from local people, none of whom were permitted to contribute more than \$100. At a meeting of subscribers, a board of directors was elected. Application was then made to the State of Missouri for a charter, through which the Greenville Improvement Corporation obtained legal status to operate as a non-profit organization with the purpose of building the new town of Greenville. The existing town of Greenville paid the \$50 incorporation fee.

The Greenville Improvement Corporation acquired the new town site and developed it according to a plan prepared by the Missouri State Planning Board. The Corps of Engineers surveyed the site, marked off the lots and streets, and made an official plat map of the town. The Board of Directors of the corporation employed a Director of Operations to work up enthusiasm among the citizens for the move, as well as to handle the technical problems associated with relocation of the town.

The Improvement Corporation made plans for a town with asphalt paved streets, sidewalks in front of every lot, adequate drainage and a public water and sewage system. These improvements were to be made possible by the agreement of the Federal government to pay the town of Greenville \$19,500 for the streets and sidewalks, with the understanding that the money should be used for the exclusive purpose of providing improvements in new Greenville. This, together with all profit realized from the sale of lots, was to serve as the sponsor's contribution for WPA projects for the construction of the improvements.

The Improvement Corporation donated lots for the county courthouse and the three churches, land for the streets, for sidewalks and for the public park. All other properties were sold at a price which would cover the cost of providing the improvements of the property.

The Corps of Engineers, having acquired all properties in old Greenville, sold the buildings at public auction. Some people bought back their houses and had them moved to the new town.

By September 1, 1941, thirty-five dwellings had been built or were under construction at the new location. Business buildings were almost ready for occupancy, and moving of houses from the old town to the new had begun.

New Greenville

Description of the town. New Greenville was located on sloping hills above the level of Lake Wappapello two miles north of the old town east of Highway 67. The service station and garage area bordered the highway while the business district lay farther back in a central location. Just to the north and across the street from the business district stood the new Wayne County courthouse. To the south of the business district lay the commercial area. In front of the business area was a wide parkway providing parking facilities for all who came to the town to trade or transact business. Beyond the parkway extended a public park, and beyond, in a small block by itself, stood the school building with a large play field.

The residential area was laid out along a few well planned curving streets, fitted to the topography and planned so as to give maximum advantages in building sites. None of the residential streets was considered as a through street—most of them ended in a “cul-de-sac” or turn-around. This plan gave the individual property owners more privacy, greater safety and provided a more pleasant grouping of dwellings than did the old grid pattern of streets. All lots, approximately seventy-five by two hundred feet, or the equivalent in area, furnished ample space for a single family unit.

Building restrictions. Building restrictions for the town were drawn up by the State Planning Board, adopted by the Greenville Improvement Corporation and were incorporated into the Articles of Agreement for a Deed signed by the purchaser of property. These restrictions determined use of land, location of buildings on property, minimum requirements for dwellings, allowances for easements to permit installation or maintenance of public utilities and the miscellaneous provisions permitted in the town.

Population. By 1948, the new town of Greenville had a population of 252 persons. One hundred eighteen persons had moved directly from the old town to homes in the new town; 26 had moved to some other location when the old town was abandoned but had later returned to the town to make their homes (Table 18). Fifty-four persons or 21 operators who formerly owned land in what is now the reservoir area continued to farm the same land. However, they established residence in the town to be near schools and other community services, or to avoid living in an area threatened by danger of repeated flooding or of disrupted transportation facilities.

At least 90 percent of the population of Greenville were former residents of the old town or people who had moved into town from Wayne or an adjacent county. Sixteen persons, or 6 percent of the total, had moved to Greenville from an adjacent county. Thirteen persons were living in the homes they occupied before new Greenville was built. Of the remaining 25 persons, nine were employees of the State Highway Department living in the town until construction work on U. S. Highway 67 was completed; five had come from St. Louis and five from Granite City. No information about the remaining six was

TABLE 18--POPULATION DATA FOR NEW GREENVILLE - 1948^{1/}

Item	Number	Percent
Former residents of old Greenville	144	57
Moved direct from old Greenville	(118)	
Moved away from area and returned	(26)	
Residents of original home ^{2/}	13	5
Former residents of Wayne county	54	22
Former residents of nearby counties	16	6
All others	25	10
From St. Louis area	(10)	
State highway department employees	(9)	
Former residence not determined	(6)	
Total	252	100

^{1/}Data supplied by well-informed, long-time residents of area.

^{2/}Living in homes they occupied before New Greenville was built.

available.

The town of Greenville had a high proportion of older people (Table 19). Fifty-two persons, or approximately 21 percent, were widows, widowers or bachelors. Thirty-four were elderly couples many of whom had retired from active business pursuits. For the United States as a whole, only 7.5 percent of the people were in this age group. The new town had over twice as many old people as did old Greenville in 1940. This ratio indicates that a large percentage of young people left the area when the town was moved, but the older people chose to stay. Government purchase of farm land resulted in early retirement for some of the farmers who were nearing retirement age. Approximately 48 percent of the total population was under 35 years of age. This compares with 62 percent for old Greenville in 1940; the greatest difference, however, appeared in the school age group. The proportion in the group 35 to 64 years of age was approximately the same in 1948 as in 1940.

TABLE 19--POPULATION DISTRIBUTION BY AGE GROUPS, GREENVILLE AND WAYNE COUNTY

Age Group	Greenville	Greenville	Wayne County
	1948 ^{1/}	1940 ^{2/}	1940 ^{2/}
	Percent	Percent	Percent
Under 7 years	8	8	11
7 - 19 years	15	29	33
20 - 34 years	25	26	21
35 - 49 years	16	17	16
50 - 64 years	11	11	12
65 years and over	21	9	7
Information not available	4	0	0
Total	100	100	100

^{1/}Data supplied by well-informed long time residents of Greenville.

^{2/}Data from U. S. Census, 1940.

Homes in the new town. There were eighty-six houses in new Greenville of which about half were new and half old dwellings which were bought at auction from the Corps of Engineers in old Greenville and moved to their present sites. When the houses were moved they were set on new foundations, repaired and redecorated. Ninety-three percent were owner occupied. This compares with 67 percent in old Greenville.

Forty-one percent of the interviewed families moved to new Greenville in the period 1940-42. The remaining growth of the town occurred after the war. Building activity, curtailed during the war, increased. Many residents migrated into town from the reservoir area following the severe flood of 1945. Some people who had gone to work in industrial areas during the war and some ex-servicemen returned to live in Greenville after the war. Development of the reservoir region into a recreational area contributed to the growth of Greenville. All the houses in new Greenville were wired for electricity, but only 52 percent had private water supply and sewage disposal systems.

Business establishments. The compact business district of Greenville covered a two-block area zoned for business purposes when the town was planned. Table 20 shows the kinds of business establishments in Greenville in 1948. An appliance store opened just before the study, and there was an unfinished theater building. A building was being erected for a dry goods or department store, and new buildings had been constructed to accommodate an automobile sales agency and an implement company.

Churches and cemetery. The Federal government purchased the church properties in the old town. The different church organizations acquired the buildings from the government and moved them to the new town.

The Christian Church members dismantled their building and moved the materials to the site given by the Greenville Improvement Corporation. The lumber was trimmed and the new building—a replica of the old church—was built with the dimensions about two feet less. Since the congregation did not have enough money to reconstruct the church building, they appealed to other Christian churches in the area whose members contributed enough to free the church from debt. The congregation was reduced from 30 to 12 by the relocation of the town, but had increased to 18 at the time of the study.

The Methodist congregation owned a parsonage and a church building in old Greenville. They employed a contractor to dismantle the church building and to erect a church in the new location from materials salvaged from the old building. They bought a house at auction in old Greenville and moved it to the new town to serve as the parsonage. The congregation later sold this house and planned to build a new parsonage when building costs decreased. The church membership decreased approximately half by people moving away. This church, served by a part-time pastor, held services monthly.

The Baptist congregation did not get sufficient funds from its church in the old town to pay for a new building. However, with contributions from the local

TABLE 20--NUMBER AND KINDS OF BUSINESS FIRMS IN GREENVILLE - 1948

Kind	Number
Abstract office	1
Auto and implement	1
Barber shop	1
Beauty shop	1
Blacksmith shop	1
Doctors	2
Drugstore and soda fountain	1
Garage and filling station	1
General stores	2
Grocery stores	2
Hardware and lumber company	1
Hotel	1
Jeweler	1
Lettering factory	1
Pool hall	1
Printing office	1
Restaurants ^{1/}	4
Undertaker	1
Post Office	1
Motor lodge	1
Service station	1
Bus station	1
Terminal for a motor freight line	1
Tailor shop	1
Shoe repair shop	1
Tavern	1

^{1/} Two on edge of town on highway.

membership, the congregation managed to rebuild the church and to pay off all debts. The members started construction of a parsonage and hoped within a short time to secure a full-time pastor.

At the time people were moving to the new location they considered the unification of the churches but the one resident minister disapproved; consequently, all the churches were re-built and members were going from one to the other, depending on where services were being held on any particular Sunday.

The cemetery in new Greenville was located across Highway 67 from the town on the ground that was not in danger of inundation.

School. The school board of Consolidated District No. 3—Greenville School District—received \$82,705 for its properties in old Greenville, consisting of a building completed in 1934, a grandstand and a lot. After the school board had bought the site for the school ground in new Greenville from the Greenville Improvement Corporation, they obtained a WPA grant for construction of

a building which was completed and occupied in the fall of 1943. This building housed both the elementary and the high school. The board added a new vocational agriculture building in 1945. Although proud of their new school plant, many people in Greenville insisted it compared unfavorably with the one in the old town. It would seem from reports that the original plans called for another wing on the building, not added because the WPA program was stopped before the building was completed. The local district did not have enough money to complete the building as planned, partly because a \$14,000 bonded debt had been retired with the funds received from the sale of the old building.

Courthouse. Greenville had been the county seat of Wayne County for more than 100 years. Local residents anxiously desired to have the town relocated in a way that would make it possible to keep its name and its status as a county seat town. Had it been impossible to retain the courthouse, it is questionable whether relocation of the town would have been attempted.

The courthouse in old Greenville, completed in 1926, would have served the county adequately for many years. This building was purchased from the county by the Federal government for \$70,352, a sum deemed sufficient to allow for the cost of replacing it on a new location. Of the \$70,352, approximately \$10,000 was used to retire indebtedness on the old courthouse and the remainder went to pay the sponsor's cost on a WPA project to construct the new buildings.

The relocation of the courthouse became a controversial issue. The Greenville Improvement Corporation gave the grounds on which it now stands. A free lot was offered by James Kail in the present location of Kailville. Many felt that the relocation should be brought to a vote of the people of the county. To avoid losing its county seat status, Greenville extended its city limits to include the site selected for new Greenville. The county court then ordered that a suitable court building and an adequate jail for Wayne County be constructed on a site selected and designated according to law. This site was to be located within the existing city limits and corporate territory of the city of Greenville, the established seat of justice and county seat of Wayne County. The site selected by the county court for the new courthouse was the one designated in the "Plan for Greenville." A WPA project for building the courthouse was granted and construction began.

The new courthouse was a compact building, conveniently located with respect to the business district of Greenville. As with the school, local citizens were unhappy because the courthouse was never completed. This, again, was caused by the sudden stoppage of the WPA program because of approaching war, and to the lack of funds after part of the sale price was used to retire indebtedness.

After relocation of the town, the people again voted to change its limits—this time to exclude the area of the old town together with the narrow strip along the highway which was annexed to facilitate the move to the new location.

Roads and sidewalks. All streets in new Greenville were graded to specified levels and heavily graveled. The plan for asphalt paved streets had not yet materialized in 1948. The town had 13,807 feet of four-foot sidewalks in the residential sections and one thousand feet of eight-foot walks in the business district.

Utilities. Electric service was provided by the Arkansas-Missouri Power Company. All homes and business establishments were wired for electricity and there were adequate street lighting facilities.

Until 1947, the entire population of Greenville used a single public telephone installed in the local drugstore. Its only value was for long distance calls since there were no other local phones. In the spring of 1948, a dial system was installed in the town. There were 36 subscribers. It was reported that the people had become so accustomed to being without phones that many of them did not subscribe. The delay in establishing telephone service to the town was due to the equipment shortage caused by the war.

The long-hoped for water and sewage system for Greenville failed to materialize. A firm of engineers drew a plan and the State Division of Health approved it as early as 1941. The outbreak of war and the consequent materials shortage made it impossible to go on with the plans. The Improvement Corporation decided, because it could not provide all of the improvements promised, to refund half of the original cost of the lots to property owners. This destroyed the hope for a water system in the town. By 1948, half of the people had installed their own water and sewage disposal systems. Together, they had spent almost enough money to pay for a public water and sewage system. It is not probable now that there will be much demand for a public water supply or sewage disposal system. The citizens provided an adequate drainage system for all parts of town, including 800 feet of covered storm sewers.

Parks and playgrounds. New Greenville had a public park, located just across the parking area from the business district. Although it had not been developed in any way, it did provide an open area in the center of the town. Beyond the park, the public schoolyard gave ample playground space.

Financial status. In 1938 the total assessed valuation of real property in old Greenville for taxing purposes amounted to \$88,840, (Table 21). During the period that people were moving from the old location to the new, this value fell until in 1944 it was \$53,510, or 60 percent of the pre-reservoir value of old Greenville. With the increase in assessed values and increased building since the war, the assessed value of real property at the time of the study was \$84,460—approximately the same as for the old town before the move. The city tax rate for general revenue purposes remained at 25 cents per \$100 valuation through the years. In 1945 an additional 25 cents per \$100 was levied to provide for streetlights in the town.

At no time had Greenville gone into debt to provide for any services or improvements. Most of the improvements had been financed by the Greenville

TABLE 21--ASSESSED VALUATION, TAX RATE AND NUMBER OF TAXPAYERS, GREENVILLE, MISSOURI, 1938-1948

Year	Assessed Valuation on Real Property	Tax per \$100 Valuation	Number of Taxpayers
	Dollars	Cents	Number
1938	88,840	.25	164
1939	88,870	.25	163
1940	88,870	.25	164
1941	81,750	.25	154
1942	60,430	.25	147
1943	59,690	.25	91
1944	53,520	.25	86
1945	57,945	.50	94
1946	62,570	.50	99
1947	73,770	.50	124
1948	84,460	.50	136

Improvement Corporation from funds obtained from the sale of property.

New Kailville

At the same time that the Greenville Improvement Corporation was planning for its model town, a move was underway to establish another town nearby. James Kail bought a piece of farm property, formerly the Clardy White farm. This property, on a hill between the sites of old and new Greenville and near the second of the two sites originally selected for study by the State Planning Board, was divided into small lots laid out in the traditional grid style. Streets were marked off but no other improvements or services were provided. Electric lines were brought to the site by the power company.

An attempt was made to locate the courthouse at this site. A news article from the *Greenville Sun*, printed July 4, 1940, reports "an offer of a free lot for the courthouse was made at this location." This was at the same time the Greenville Improvement Corporation was trying to assure that the new town of Greenville would remain the County Seat of Wayne County.

Lots sold in Kailville ranged in price from \$25 to \$50 each, while lots in new Greenville sold for \$125 to \$325. The higher price of a lot in Greenville provided for sidewalks, hard surfaced streets, and sewage and water connections. When it became apparent that the sewage and water systems would not materialize, half the cost of the lots in new Greenville was refunded to the purchasers as mentioned. However, the lower cost of the unimproved property in Kailville was enough to make some families decide to settle there.

At the time of the study there were approximately 26 homes and 85 residents in this settlement. Some of the houses were new but others had been moved from old Greenville. Approximately 30 percent of the residents of Kailville moved there from the old town, 60 percent came from other parts of Wayne County and the remaining 10 percent were newcomers to the area.

The people of Kailville went to Greenville for most of their commercial and social activities. There were no churches or other community activities in the settlement. Children were transported to the school in Greenville. There was one general store and a "beer parlor" in the village, but for the most part this settlement was merely a adjunct to the town of Greenville.

Remaining Section of Old Greenville

The northeast portion of the original town of Greenville stood on ground that was high enough to reduce the danger of flooding to a minimum. Consequently the homes in that section of the reservoir area were left and leased as residential property. There were 11 houses and about 20 people in this area. Two of the houses, built during the time that the other property in the town was being acquired for the reservoir, were quite desirable. The others were old and had little or no maintenance since they were bought by the Corps of Engineers.

The Human Element in Relocating a Rural Town

The creation of a new community is a startling idea. Existing towns have generally grown too slowly for any one generation to understand the process. Relocation presents many problems for the individual as well as the group, problems with which people have had little experience. The creation of a new town is also a rare opportunity to develop a community designed for good living. In so large an undertaking there is definite need for technical assistance. In the case of Greenville, the Missouri State Planning Board, helped by consultants from the National Resources Committee, provided much needed assistance. Both of these agencies have gone out of existence. The Greenville Improvement Corporation employed a Director of Operations to help with the development of the new town.

Because of the advantages of sound planning, technical assistance should be available to the community when it is necessary to move a town. Provision for such assistance should be made a part of the cost of the flood control program.

Confusion in determining new location. It is very difficult to develop a plan that will have the general support of everybody affected. In this case, instead of one new town, there are two new settlements, Greenville and Kailville, and a few homes remain in what was part of the former city of Greenville. This fragmentation has occurred in other places. When the town of Linn Creek, Missouri, had to be moved, the two towns of Camdenton and New Linn Creek were formed. When the town of Butler, Tennessee, had to be abandoned because of the establishment of a Tennessee Valley Reservoir, Carderview and new Butler were formed.

The people in a community should avail themselves of the services that can be provided most economically through group actions, as well as contribute to their support. This is hardly possible if a group, small to begin with, selects two town sites in place of one. Local people who are confronted with this problem

need to take measures to keep the community united.

Re-establishing public buildings and facilities. When a town is relocated, the people may not be able to finance the construction of public buildings and other facilities. This problem arises because the government does not pay enough for public buildings at the old location to provide adequate facilities at the new location. Furthermore, in the case of Greenville, the outstanding indebtedness was retired, which made it still more difficult to finance the construction of new buildings.

An alternative would be for the government to rebuild public buildings or other facilities. There would then be no question of completion. No financial settlements would be necessary. A rise in prices would not deprive the community of a comparable building. Any bonded debt could be carried over as an obligation on new facilities.

Where replacing public buildings by the government is not feasible or desired by the community, an alternative would be for the federal government to lend the additional money which the town needs for the type of building it wants to construct or services it wants to provide. Such loans could be repaid from revenues. This would enable the town to build more adequate structures and facilities, modernize existing ones or make other changes not possible if the government rebuilds the old structures. This would also provide funds in place of those no longer available where special revenue bonds have to be retired. Financing through new bond issues often is not feasible under unsettled conditions.

It would seem that the cost of replacing existing public facilities is a legitimate cost of the project. This would apply to relocating roads, streets, sidewalks, water supply and sewage systems or any other established public facilities or public buildings. When an area is disrupted by a project designed to bring about improvements in use of resources, the government should try to lessen the impact on the people who are asked to give up their property.

Alternatives to re-establishment in comparable situations. If possible, re-establishment should avoid perpetuating bad situations. Agencies such as the Small Business Administration and the Employment Security Division should coordinate their operations to reach common economic goals. Inadequate services should not be re-established. There are alternatives. One alternative would be to use the payments received for re-establishment to expand the community services of a trade center in the area that the displaced people would accept as their new home and which possesses growth potentials.

Cost of moving. The cost of moving household equipment from the old town to the new was negligible. When residents of new Greenville were questioned about the move, they estimated this cost to be less than \$10. The distance was only two miles. Expenditure of time and effort was considerable, but the actual cash outlay was small. For the most part, people hired trucks and did their own work. Some families who moved their houses left their furniture

and personal belongings in place and moved them with the house.

The cost of moving a business establishment varied with the kind of business. If the stock was small as in a small grocery store, the cost of moving was negligible. The son of the owner of a small store in new Greenville said labor was the chief factor. This store was closed for only one day to permit the movement and rearrangement of stock.

When the business involved heavy or precision equipment, the cost of moving was high. The cost of moving the printing shop from the old town to the new was estimated at \$700. To have the machinery disassembled and properly reassembled, it was necessary to hire an expert machinist. The labor cost for this work was \$500. Another problem in moving the newspaper office was that if it failed to print an edition of the paper, it would lose the right to print legal notices. Had the newspaper lost this right, it would have been necessary to publish for three years to re-establish its legal status. Consequently, the moving was spread out over three weeks in order to keep the publication continuous. The type was set in one location and the rest of the work was done in the other. This was possible because it was a weekly newspaper.

Another cost was that of selecting a new location. Before selecting a new location for the town of Greenville, the business and professional men spent much time investigating possible new locations. This cost, difficult to appraise, is very real to the people.

Re-establishing a business firm or professional practice in an entirely new community also involves a cost difficult to appraise. An established business will have developed its markets, and a professional man his clientele. This good will has value. When a business must be re-established in a new community, it has a lower value than before. The loss that accompanies interruption of normal community activity is not considered by the Federal government as part of the cost of a reservoir.

Loss of business. The moving of the town was accompanied by a noticeable loss of business. The sales tax collections for Greenville reflect this fact. Twenty-six percent of the Wayne County tax collections came from Greenville in 1938 compared with 7.8 percent in 1945 and 12.5 percent in 1947 (Table 22). Greenville's share of the business of Wayne County was reduced at the same time that the total business done in Wayne County increased.

Besides loss in business, there was a loss in the number of business establishments. Twelve of the 39 business and service establishments of old Greenville moved to the site of the new town. Other firms gradually replaced some which moved away. After seven years, new Greenville had 36 business concerns, only three less than in the old town. The new town still lacked some types of firms that were in the old town. The major loss was the bank. Also the new town did not have a women's and men's furnishings store and, at the time of the study, had not completed a theater. The new town had lost the professional services of a dentist and three lawyers who were practicing in the old town.

TABLE 22--SALES TAX COLLECTIONS IN GREENVILLE AND WAYNE COUNTY, 1934-1947

Year	Greenville	Wayne County	Percent of County Sales Tax Collected from Greenville
	Dollars	Dollars	Percent
1934	4,158	12,373	33.6
1935	4,115	13,973	29.4
1936	4,386	15,006	29.2
1937	3,396	13,532	25.1
1938	3,675	14,121	26.0
1939	4,112	16,466	25.0
1940	2,711	17,414	15.6
1941	3,500	21,428	16.3
1942	1,700	19,074	8.9
1943	2,324	21,150	11.0
1944	2,499	23,122	10.8
1945	1,971	25,341	7.8
1946	4,423	41,227	10.7
1947	6,750	54,039	12.5

Source: Data from sales tax records.

Lack of rental property. Those people who were renting their homes received no financial settlement of any kind but were forced to move to a new location. If they chose to remain in Greenville they were almost forced to buy property since little rental property was available in the new town. The same problem arose in business establishments. Operators who owned their establishments were paid for their property and could rebuild while those who rented store or office space in the new location had nothing. The cost of moving for a renter or an owner is a cost incurred as a result of development of the flood control reservoir. It seems that some method could be devised to compensate the losers for such costs.

Dissatisfaction with property settlements. People in Greenville expressed certain dissatisfactions with property settlements. Some people questioned the adequacy of consideration given to differences in quality, age, condition and other variations between residential properties in determining the appraised values. Some thought the appraisal of houses in town was based on a flat \$100 per room, or some other set figure, without examination. Some local people claimed that the appraisers were never inside their houses but did place a value on the property. The appraisal sheets, however, showed considerable detail indicating that the houses must have been examined. Some reported that while their own property settlements were entirely satisfactory, other people were not given a fair deal. The original option prices on some properties were cut before they were accepted by the Corps of Engineers. The people of Greenville were under the impression that this was a general 10 percent reduction. The options

were reduced because field representatives negotiated for the land considerably above the appraised value and these options were later rejected. It would have been better had the field personnel been informed within what range they could accept options.

As with farm land, the Corps of Engineers held the appraisal data confidential for the property acquired in Greenville. This was a cause of dissatisfaction, for it led to the conclusion that instead of a fair price being paid for their property, an attempt was being made to purchase the property at the lowest possible price. If the property settlements in Greenville represented the market value of the property, then a more nearly adequate public relations program should have been developed. The people should be given sufficient information to remove the deep-seated dissatisfactions and resentments that existed at the time of the study.

EFFECT OF RESERVOIR ON COUNTY GOVERNMENT

Because the major part of the purchase area was located in Wayne County, only that county was studied. It was assumed that most of the consequences of the project would be found there.

Assessed Values and Taxes

The total assessed value of property in Wayne County in 1939 was about \$6,270,000. Of this amount general property accounted for 63 percent; railroads and public utilities, 36 percent; and merchants and manufacturers, 1 percent. By 1941, assessed values had dropped to about \$5,320,000, a reduction of 15 percent from 1939. For 1941, general property accounted for 70 percent of the total assessed value; railroad and public utilities, 28 percent; and merchants and manufacturers, 2 percent. Since 1941 there has been a gradual increase in valuation. Total assessed valuation for 1948 was \$6,069,000, an increase of about 12 percent over 1941. Taxes levied totaled over \$24,000 in 1937 but increased to over \$27,000 in 1940 and over \$30,000 in 1948 (Tables 23 and 24).

Railroad and public utility valuation dropped from \$2,366,000 in 1938 to \$1,503,000 in 1941, a loss of 37 percent. The St. Louis-San Francisco Railroad abandoned 33 miles of track by 1940 with an assessed valuation of over \$638,000 in 1938. There was some question as to just how much effect the reservoir had on the abandonment of the railroad. After the flood of 1935, the railroad petitioned the Inter-State Commerce Commission for permission to abandon the line because of excessive operating costs for the amount of revenue obtained. Missouri Public Service Commission records indicate that the railroad was operating at a loss and service was not dependable. Portions of the line had been abandoned previously and it was reasonable to assume that the entire line would have been abandoned eventually. The construction of the reservoir brought about earlier abandonment than normal. Railroad facilities were not replaced when the dam was built and the Federal government made a cash settlement

TABLE 23--PROPERTY TAX RATES PER \$100 VALUATION NOT INCLUDING SCHOOL TAXES, WAYNE COUNTY, 1937-1948

Year	County Revenue	Special Road and Bridge	Interest and Sinking Fund	Total County Rate
	Cents	Cents	Cents	Cents
1937	40	25	02	67
1938	40	25	02	67
1939	40	25	02	67
1940	50 ^{1/}	25	02	77
1941	50	25	--	75
1942	50	25	--	75
1943	50	25	--	75
1944	50	25	--	75
1945	50	25	--	75
1946	50	35	--	85
1947	50	35	--	85
1948	50	35	--	85

^{1/} Limitation changed by a constitutional amendment.

TABLE 24--COUNTY TAXES LEVIED FOR GENERAL REVENUE PURPOSES, WAYNE COUNTY, 1937-1948

Year	Real Property	Personal Property	Merchants & Manufactures	Railroad & Public Utility	Total
	Dollars	Dollars	Dollars	Dollars	Dollars
1937	12,644	2,056	439	9,144	24,284
1938	13,239	2,457	477	9,462	25,636
1939	12,797	2,628	459	8,985	24,869
1940	15,815	3,390	562	7,928	27,696
1941	14,978	3,154	581	7,409	26,123
1942	15,102	3,883	595	7,612	27,254
1943	14,552	4,543	562	7,822	27,481
1944	13,343	5,516	579	7,854	27,294
1945	14,232	4,925	601	7,889	27,648
1946	18,480	^{1/}	639	7,990	27,110
1947	19,360	^{1/}	924	8,375	28,661
1948	20,127	^{1/}	1,046	9,217	30,391

^{1/} Included in figure reported for real property.

Source: State auditor and county reports.

with the company. Other utility companies relocated their lines with little change in assessed valuation.

The assessed value of the 45,000 acres of land purchased for the reservoir was estimated at \$720,000 on the basis of 1938 valuations. This was about 22 percent of the total assessed value of real property for that year. Acquisition of land was started in 1937 and virtually completed by 1942. The assessed value of

all real property was about \$3,328,000 in 1937 and \$2,999,000 in 1943, a reduction of \$329,000. In other words, the assessed valuation of real property dropped less than the estimated assessed value of land taken off the tax rolls. Apparently the assessed value of the remaining real property in the county was increased to offset, at least partially, the loss of tax base resulting from federal purchase of land.

Rental Income from Reservoir Land Paid to Wayne County by the Federal Government

Land acquired for the Wappapello Reservoir but located above certain elevations was seldom, if ever, subject to flood damage from the operation of the reservoir. This land was leased for agricultural or other purposes.

Provision for distribution of income. Under the provisions of the 1941 Flood Control Act, 25 percent of all money received on account of leasing lands acquired shall be paid to the state to be expended as the State Legislature may prescribe for public schools and roads of the County in which the property is situated. In 1946 this law was amended to increase the share returned to the State to 75 percent of the rental income received.

The General Assembly of the State of Missouri passed an Enabling Act requiring the county court to use any such funds received for maintaining schools and roads. It was the opinion of the Attorney General that any funds received could be apportioned to schools and roads in any amount the county court deemed advisable or necessary.⁷ Furthermore, the county court could allocate funds designated for schools to all schools in the county and not exclusively to those originally in the reservoir, some of which may no longer exist.

Rental income. Leasing of Federally owned land in the Wappapello Reservoir was started in 1939. The income was small the first year because not all of the land for the reservoir had been acquired and it took time for the leasing program to get into full operation. For the year 1939-40, the Federal government received only about \$800 rental from the land (Table 25). Returns to Wayne County were even smaller because the Flood Control Act required that only one-fourth of the rental income be paid to the county. By 1946, the leasing program was rather well established. By 1947, more than \$26,000 was collected by the Federal Government of which more than \$19,000 was returned to Wayne County.

Total Tax and Rental Income

The tax burden in Wayne County was heavier the first few years after the reservoir was built than it was previously. This was in the period after the reservoir land was taken off the tax roll and before rental returns to the county were very large. Although cost of government remained fairly constant, there

⁷Letter from Aubrey R. Hammett, Jr., Assistant Attorney General approved by J. E. Taylor, Attorney General, to H. H. Mobley, Director, Division of Resources and Development, dated January 17, 1949.

TABLE 25--RENTAL INCOME RECEIVED BY FEDERAL GOVERNMENT FROM RESERVOIR LAND, AMOUNT PAID WAYNE COUNTY AND ITS ALLOCATION TO SCHOOLS AND ROADS

Year	Rental Income Received by Federal Government ^{1/}	Rental Funds Paid Wayne County ^{1/}	Rental Funds Allocated by Wayne County ^{2/}	
	Dollars	Dollars	For Schools	For Roads
1940	815	204	153	51
1941	5,673	1,418	1,063	355
1942	10,268	2,567	1,925	642
1943	16,333	4,084	3,063	1,021
1944	21,480	5,370	4,028	1,342
1945	22,032	5,508	4,131	1,377
1946	24,699	6,175	4,631	1,544
1947	26,073	19,555 ^{3/}	14,666	4,889
1948	28,000	21,000 ^{3/}	15,750	5,250
Total	155,373	65,881	49,410	16,471

^{1/} Data supplied by District Engineer, Memphis.

^{2/} From county records.

^{3/} Figures for fiscal year 1948 are approximate only.

was a decline in taxes as land and utilities were taken from the tax roll. As the people moved from the area, there was a loss in personal property taxes. After a few years, rental returns became larger than the taxes would have been from this same land in private ownership. When the lease returns were included, the amount of money available for road and school purposes in Wayne County was probably as large as it would have been without the program. This is illustrated in Figure 2 in which assessed valuations of Wayne County are compared with the average of five surrounding counties and adjusted in terms of lease returns.

County Road System

County roads in the area had presented a problem because of the terrain. The road problem had been further aggravated by the "checker-board" pattern of purchase by the Federal government for the forest reserve, beginning in 1934. Before the reservoir was built, Wayne County had a network of roads totalling about 400 miles. Although they were typical Ozark roads, they were passable most of the time. The roads along the river were flooded frequently but the floods were brief. The roads were not disturbed by the Federal purchase program for forestry purposes but maintenance became negligible and, for the most part they became only passable trails.

Disruption of roads. Purchase of land for the Wappapello Reservoir disrupted the county road system. Before construction of the reservoir, there were six crossings over the river between Wappapello and the Sam A. Baker State

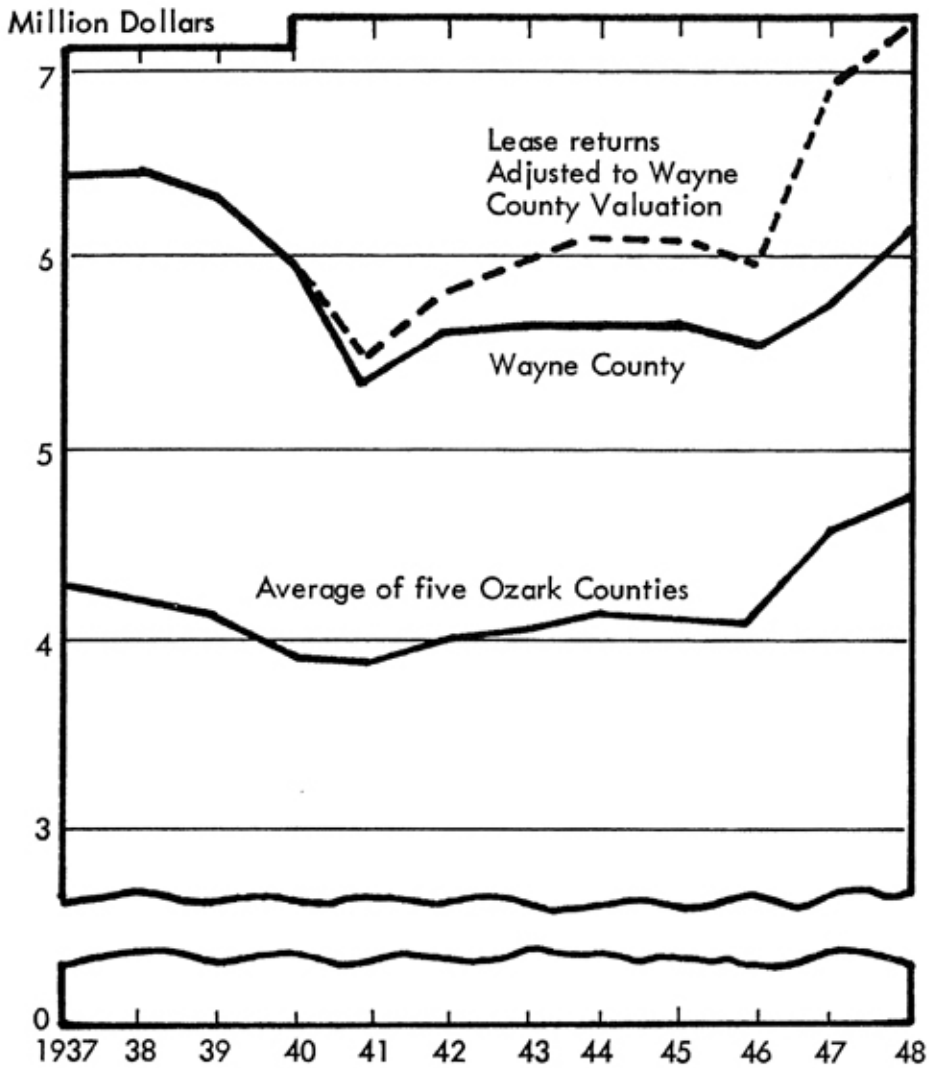


Fig. 2—Total assessed valuation of Wayne County compared to average of five surrounding Ozark counties and adjusted valuations for Wayne County in terms of lease returns.

Park; after construction, there were only two crossings. The east side of the reservoir below Greenville remained isolated to a certain extent even though the county had completed a road from Wappapello to Greenville through McGee. People living on the west side of the Reservoir, between U. S. Highway 67 and Patterson, had to travel about twenty miles to reach Greenville. Before construction of the reservoir the distance was about five miles. A new road in this area was being built. In case of extreme high water some areas were completely isolated for a time.

Compensation for road disruption. The Federal government obtained title to the roads through a "Declaration of Taking," depositing \$147,500 with the Federal court, a sum equal to the appraised value. After negotiations extending over several years, the county agreed to accept \$147,500 as full settlement for taking certain roads and to give a flowage easement over other roads. This sum represented the estimated cost of building the roads necessary to make the county road system "whole" plus the value of a flowage easement over roads subject to flooding. It was agreed that the matter would be presented to the United States Court for such action as necessary. The resulting court proceedings had been completed. The entire sum of \$147,500 had been distributed to the county.

The county court had placed this sum in the old county road and bridge fund and was using it. Part of the money had been used to buy road building equipment not previously owned by the county. Two roads were built to join communities isolated when the reservoir was built, and to make them accessible to the rest of the county. One other road was planned, to be financed with this money as soon as proper clearances were received from the Corps of Engineers concerning rights-of-way on government land.

Funds Available for Road Building

The amount of money available for roads decreased from 1938 to 1941. This reduction resulted from the decline in assessed valuation as land acquired for reservoir purposes was removed from the tax books (Table 26). Road funds from taxes increased from 1941 to 1948 for two reasons. One was the gradual increase in assessed valuation; the other was the increase in tax levy initiated in 1946. The levy for roads was raised from 25 cents to 35 cents per \$100 of assessed valuation. This increased the road revenues by at least \$5,000.

Funds for roads from lease returns did not become significant until 1947. Total income from rentals the first few years was low because of the time it took to acquire the entire reservoir area.

Total funds available for roads in 1948 were about 50 percent more than they were in 1937 and 1938. Eighty percent came from taxes and 20 percent from lease returns.

Revising the Financing of County Functions

The major problems facing the county were the location of roads and the

TABLE 26--FUNDS AVAILABLE FOR ROAD PURPOSES,
WAYNE COUNTY, 1937-1948

Year	Assessed Valuations	Anticipated Tax Revenue	Lease Returns	Total Funds Available
	Dollars	Dollars	Dollars	Dollars
1937	6,388,203	15,970	----	15,970
1938	6,404,723	16,011	----	16,011
1939	6,269,672	15,674	----	15,674
1940	5,918,980	14,797	----	14,797
1941	5,320,101	13,300	50	13,351
1942	5,554,443	13,886	996	14,882
1943	5,629,783	14,074	1,020	15,095
1944	5,773,150	14,432	1,342	15,775
1945	5,629,690	14,074	1,377	14,451
1946	5,531,807	19,361 ^{1/}	1,543	20,905
1947	5,729,565	20,053 ^{1/}	4,888	24,942
1948	6,068,916	21,241 ^{1/}	5,250 ^{2/}	26,491

^{1/}Based on 35 cents per \$100 valuation. All others based on 25 cents levy.

^{2/}Anticipated returns for fiscal year 1948.

method of financing the interval between the time of loss of tax base through transfer of land ownership and the growth of rental income to a significant amount. A plan of road relocation should have been agreed upon before construction began.

The need for roads after land use adjustments had been made would seem to be as important a criterion for settlement with a county and state as the value of roads disrupted. Perhaps the minimum settlement should be the value of the roads disrupted, but the final settlement might be greater. The increase could be governed by the cost of new roads needed. If the burden of essential new road construction is excessive in terms of the remaining county tax base, the cost of such roads should be borne by the Federal government. Wayne county did not receive final settlement until 1949. This delay placed a hardship on its citizens. This delay could have been avoided through better planning.

Some counties in Missouri have a very low tax base. The people have difficulty providing public buildings and equipment and paying salaries of a full quota of county officers. When the tax base is reduced through abandonment of public utilities such as railroads, or through construction of a project like the Wappapello Reservoir, the people should be given a choice among re-establishing old facilities, merging with one or more other counties, or increasing the efficiency of their social and economic institutions, including the county government, in other ways. Even if financial support is adequate before the tax base is disturbed, it may not be enough after construction of a project. It is possible to improve the efficiency of local government units in areas where the tax base provides sufficient revenue to meet all costs. Many students of political science have

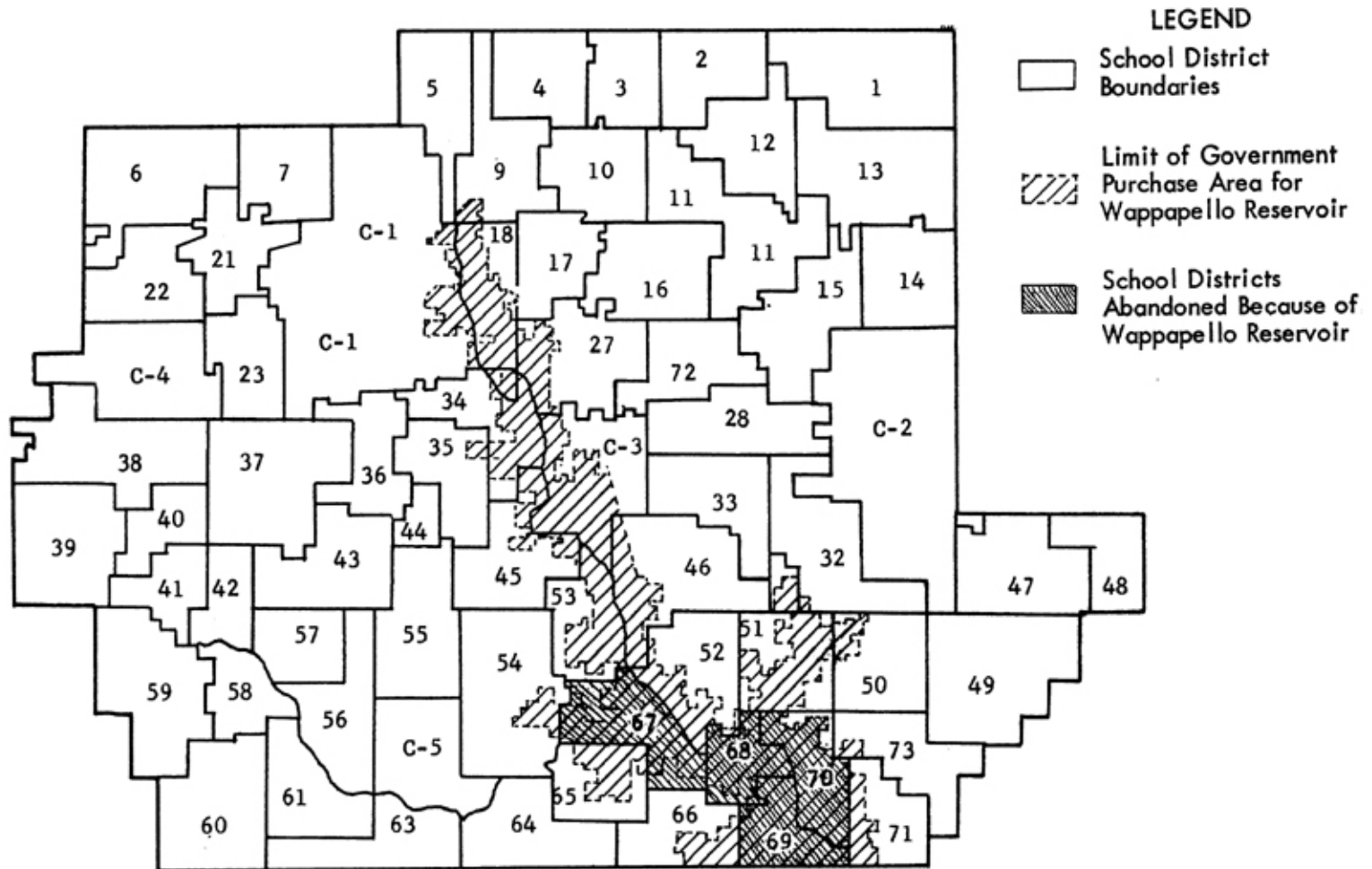


Fig. 3—School Districts of Wayne County, Missouri.

pointed out the obsolescence of a system of county government that has not changed since the county seat was reached by train or horse and buggy.

EFFECT OF THE RESERVOIR ON SCHOOLS

Land purchases for the Wappapello Reservoir affected 20 school districts in Wayne County (Fig. 3). The amount of land purchased in any one district depended largely on its location with respect to the reservoir.

Districts Abandoned

All of the schools in four districts where purchases were extremely heavy were closed and the districts were abandoned within one year after completion of the reservoir. The state law provides that as soon as districts cease to provide schools they automatically revert to unorganized territory. The school property in these districts which became unorganized territory was not purchased by the government because it was located above the purchase area line for the reservoir. Buildings and equipment were left in place. Much of the equipment has since been taken by persons unknown and the buildings deteriorated. It was not until recently that the government bought the school property in one of the abandoned districts and then only because the building, located in a wooded area, became a fire hazard when used by trespassing campers.

One of the abandoned districts had an outstanding debt of \$500 when the school was closed. The bondholders tried to collect but at that time no funds were available. Later the bondholders tried to have the property sold to satisfy the debt but no school board was available to authorize the sale. Had the government purchased the school property, this problem would have been avoided. The county treasurer paid the interest on this bonded indebtedness from the lease returns paid to the county and distributed to the district.

Enrollment

Four districts had no pupils within a year after completion of the reservoir. The total enrollment of 14 districts, in which some land was purchased, declined from 483 in 1938 to 323 in 1947, but the schools continued to operate. The average attendance in 1947 was fewer than 15 pupils in six schools compared to an attendance of that size in two schools in 1938.

Construction of the reservoir isolated portions of some school districts. One district was cut in two; subsequently, two small independent districts were formed. Each had an enrollment of nine pupils with an average daily attendance fewer than five. There were three other districts enrolling fewer than 15 pupils each. This situation suggests the need for a general reorganization and for consolidation of school districts when a reservoir is built in an inhabited area.

Distribution of Rental Income to Individual School Districts

Wayne County received its first payment of rental income from the govern-

ment in 1941. Because the amount was small the county made no distribution to the districts (Table 27). Beginning in 1943 each school district in which the government acquired some land received a part of the money. The distribution was made each year in direct proportion to least returns from the lands in each district. By 1947, nearly \$15,000 was distributed to affected school districts. One district received less than \$30, but several received more than \$1,000 each.

Funds Available for Schools

Rural Districts. The assessed valuation of the rural districts in which land was bought decreased from \$612,665 in 1938 to \$320,380 in 1947, a loss in school tax base of 48 percent (Table 28). The average school tax levy increased from 35 to 65 cents per \$100 valuation from 1938 to 1947. Total local school funds decreased from \$3,715 in 1938 to \$3,332 in 1947, a decline of 10 percent. However, state equalization funds to the fourteen districts increased from \$8,424 to \$10,582, an increase of 26 percent.

State equalization allotments to school districts increased as the assessed valuation of districts decreased. Under the State Equalization Law, public school funds were apportioned to school districts in such a manner that, regardless of the total amount of local support, the district was guaranteed a minimum of \$750 per elementary teaching unit, provided that the school district had locally levied for school purposes a tax of not less than twenty cents on each \$100 of assessed valuation (Table 29).

If the decline in average daily attendance in a school was large enough to decrease the number of teaching units, a school district received less from the State for operating expenses. This, however, did not occur in any of the rural schools in the area adjacent to the Wappapello Reservoir. On the basis of local support and state equalization funds, every school district in the area except one received an increase in school money. This particular district consistently levied the minimum tax necessary to qualify for state equalization funds. Because this school was a single teacher elementary unit, it had \$750 school money each year in spite of a 68 percent decrease in assessed valuation.

Districts maintaining high schools. Four of the school districts affected by the reservoir maintained high schools. One district had been abandoned by the time the dam was completed. Of the remaining three, two were first-class high schools and one third-class. All three maintained the same rating at the time of the study as they had before the building of the reservoir. Because of their location, these three districts were affected differently.

The Wappapello district was just east of the dam. Although some property there was bought for the project, the assessed valuation in 1947 had increased 80 percent over the 1938 valuation. State equalization allotments decreased in proportion to the increase in assessed valuation. Local school funds plus equalization quotas were \$3,655 in 1947 compared with \$3,193 in 1938. Enrollment in the school also increased in the nine year period.

TABLE 27--DISTRIBUTION OF FUNDS TO SCHOOLS BY WAYNE COUNTY FROM RENTAL INCOME PAID THE COUNTY

District		1941	1942	1943	1944	1945	1946	1947
	18	\$	\$	\$ 77	\$ 141	\$ 149	\$ 167	\$ 528
	27			144	177	248	278	880
	34			273	294	339	380	1,203
	35			3	8	8	9	29
	45			116	249	318	357	1,129
	46			208	302	281	315	997
Rural school districts	50			77	77	54	60	191
	51			175	177	153	24	76
	74						147	466
	52			98	89	66	74	235
	53			248	258	239	269	851
	54			168	205	198	222	704
	65			168	157	149	167	528
	66			25	44	33	37	117
	Total			1,780	2,178	2,235	2,506	7,934
Districts maintaining high schools	71				8	29	32	103
	C-1			273	427	516	579	1,833
	C-3	141	2,989	775	1,116	1,041	1,167	3,696
	Total	141	2,989	1,048	1,551	1,586	1,778	5,632
Abandoned school districts	67			178	181	173	195	616
	68			46	81	74	83	264
	69			6	16	17	19	59
	70			6	20	45	51	161
	Total			236	298	309	348	1,100
Total		141	2,989	3,064	4,027	4,130	4,632	14,666

TABLE 28--ENROLLMENT, ASSESSED VALUATION AND FUNDS AVAILABLE
FOR SCHOOLS IN THE DISTRICTS AFFECTED BY THE
WAPPAPELLO RESERVOIR, 1938, 1944, AND 1947

	1938	1944	1947
<u>Rural schools</u>			
Number	13	13	14
Enrollment	483	351	323
Two-teacher schools	2	3	2
A. D. A. less than 15 ^{1/}	2	4	6
Number of teachers	15	16	16
Assessed valuation	\$612,655	\$407,580	\$320,380
Local school funds	\$ 3,714	\$ 2,728	\$ 3,332
State equalization quota payments	\$ 8,424	\$ 9,203	\$ 10,582
Local support plus state equalization quota funds	\$ 12,138	\$ 11,931	\$ 13,914
Percent state equalization quota is of total	69	77	76
<u>Abandoned districts</u>			
Number	4 ^{2/}		
Total assessed valuation	\$181,985		
Local school funds	\$ 1,135		
State equalization quota payments	\$ 3,972	(abandoned)	
Total school funds	\$ 5,107		
Enrollment	125		
<u>Districts maintaining high schools^{3/}</u>			
Number	4	3	3
1st class	2	2	2
3rd class	2	1	1
Enrollment	687	496	530
Number of elementary teachers	15	10	9
Number of high school teachers	12	10	10
Assessed valuation	\$674,425	\$589,996	\$564,055
(Greenville)	\$310,315	\$158,555	\$147,880
Local school funds	\$ 9,516	\$ 6,321	\$ 7,693
State equalization quota	\$ 17,686	\$ 14,023	\$ 14,582
Local support plus state equalization quota	\$ 27,198	\$ 20,343	\$ 22,273

^{1/} Average daily attendance less than 15.

^{2/} Three rural schools and one 2-year high school maintained.

^{3/} Loss in teaching units for 1938-1947, 4 elementary and 1 high school.

TABLE 29--SCHOOL REVENUE OBTAINED FROM LOCAL SUPPORT, EQUALIZATION QUOTA AND LEASE RETURNS,
WAPPAPELLO RESERVOIR 1938-39 TO 1947-48

District	Equalization Quota			Local Support Plus State Equalization			Total Lease Returns to 1947
	1938-39	1944-45	1947-48	1938-39	1944-45	1947-48	
<u>Rural districts</u>							
18	\$ 574	\$ 602	\$ 651	\$ 836	\$ 821	\$ 869	\$1,061
27	1,224	1,214	1,167	1,591	1,500	1,767	1,727
34	498	516	582	750	750	750	2,488
35	579	615	616	750	750	918	58
45	601	641	676	806	833	808	2,170
46	465	615	618	784	817	794	2,103
50	632	648	653	802	750	850	458
51	484	581	706	983	843	802	605
74			706			802	614
52	529	641	683	750	804	784	561
53	518	677	689	750	778	800	1,865
54	1,076	1,122	1,313	1,678	1,692	2,205	1,498
65	571	640	837	908	800	945	1,169
66	673	691	685	750	793	820	256
Total	8,424	9,203	10,582	12,138	11,931	13,914	16,633
<u>High schools</u>							
71 ^{1/2}	2,231	2,111	2,091	3,193	3,250	3,655	172
C-1 ^{1/2}	7,089	6,538	7,379	10,755	9,673	10,266	3,628
C-3 ^{1/2}	8,366	5,374	5,112	13,250	7,420	8,352	10,925
Total	17,686	14,023	14,582	27,198	20,343	22,273	14,725

^{1/2} Does not include non-resident tuition or transportation allowances.

The Patterson district was in the upper reaches of the reservoir. This district also lost some land through reservoir purchases but total valuation in 1947 was slightly larger than for 1938. There had been a decrease in school enrollment and attendance during the nine years. It was questionable how much the reservoir was responsible for the decrease. The portion of the reservoir area in the Patterson district was so far removed from the dam that it had few floods and almost the entire area was under lease. For this reason the population loss from this district caused by the reservoir was minimal. The number of people in 1947 was 273 as compared with 285 in 1938. Changes in the financial status of the Patterson district were caused primarily by a decrease in state equalization funds resulting from a lowered average daily attendance in the elementary school. This amounted to \$1,500 per year because of the loss of two elementary teaching units. Total local support for schools was lower in 1947 than in 1938 because of a decreased tax levy.

The Greenville district was located approximately 22 miles upstream from the dam, just beyond the head of the permanent pool of the reservoir. Government purchase of farm property was heavy. This district suffered a decrease in valuation because of the relocation of Greenville. Total assessed valuation decreased from \$310,315 in 1938 to \$147,880 in 1947, a loss of 52 percent in the tax base. Consequently, local school funds decreased in spite of an increase in tax levy. State Equalization quota allowances to the district decreased by \$2,500 per year because of a decrease in average daily attendance resulting from the population loss. Total enumeration of the district decreased from 221 to 135 in the nine year period.

Impact of Flood Control on Rural School Financing

Distribution of money received on the basis of lower assessed valuation created problems. The four abandoned districts continued to receive their allocations even though the districts no longer legally existed. In 1947 they received a total of more than \$1,000. There was no need for this money except that one district still had an outstanding bonded indebtedness of \$500. There were also other instances in which those districts that were most in need of funds received less than others not in need of aid. Under the State Equalization Law, certain school districts received state aid to offset loss in local taxes resulting from a decrease in assessed valuation.

There is need for further study regarding the best method for distributing funds to the various districts. Need for funds, as a result of the impact of the reservoir construction, should receive more attention. In some instances, more money should be spent on roads as an aid to school reorganization. If a district has an increase in number of pupils because of movement of population into it from a reservoir area, it may deserve aid even though the Federal government purchased no land in that district.

Greater flexibility in use of funds according to need seems desirable. A com-

mittee of representatives of various units of government should be given a chance to recommend distribution of the funds.

Consideration should be given to redistricting and consolidating schools. There is evidence of inadequate school support even before disruption.

Another problem is associated with changes in bonding capacity. School districts may have financial problems even though rental revenues become larger than taxes formerly collected. When land is taken off the tax roll, the district loses its capacity to borrow (Table 30). Should a district need to borrow for a new building, repairs or equipment, it might not be able to, even though its rental returns may in a few years equal the former taxes. Special legislation may be needed to permit schools to issue bonds supported in part by rental revenues. The bonded indebtedness permitted could be proportional to the capitalized value of the average rental return for the preceding three or five years.

TABLE 30--CHANGE IN BONDING CAPACITY OF SCHOOL DISTRICTS
IN THE WAPPAPELLO AREA, 1938-1947

District	Bonding Limit on 1938 Valuation Dollars	Bonding Limit on 1947 Valuation Dollars	Change in Bonding Capacity Dollars
<u>Rural districts</u>			
18	2,143	1,318	- 825
27	2,270	2,962	+ 692
34	3,492	1,173	-2,319
35	1,467	1,401	- 66
45	1,875	640	-1,235
46	3,448	879	-2,569
50	1,290	1,111	- 179
51 ^{1/}	2,556	569	-1,987
74		569	+ 569
(51 and 74)			(-1,418)
52	2,243	419	-1,824
53	2,694	548	-2,146
54	4,436	3,532	- 904
65	1,760	365	-1,395
66	959	533	- 426
Total	30,633	16,019	-14,614
<u>High schools</u>			
71	2,565	4,620	+2,055
C-1	15,640	16,189	+ 549
C-3	15,516	7,394	-8,122
Total	33,721	28,203	-5,518
Total - all Districts	64,354	44,222	-20,132

^{1/} District number 51 split into number 51 and number 74 by 1947.

RECREATIONAL DEVELOPMENT

The potentialities of flood control reservoirs for recreation were recognized by the Congress in the Flood Control Acts of 1944 and 1946. The Corps of Engineers was authorized to construct and operate public park and recreational facilities in the reservoir area and to permit construction and operation of these facilities by others. When not contrary to public interest, water areas were to be open for recreational purposes, generally without charge. The Corps could grant leases on lands in the reservoir provided preference was given to federal, state and local governmental agencies. In 1946 the Corps of Engineers prepared a plan for the development of Wappapello Reservoir for recreational uses.

Landowners also saw the potentialities for recreation. A few tracts particularly well located for recreational uses were kept by the owners when land was being acquired for the reservoir. Some of these privately owned tracts were developed rather early. Construction was interrupted during the war years but a considerable number of buildings, including about 15 small resorts and numerous private cottages, were constructed after 1945. These facilities were all located upon privately-owned land. The Wappapello Reservoir has been used by the public for boating and swimming since 1941 and for fishing since 1942.

Development

Three types of recreational facilities were developed at Wappapello. These were public-use, commercial, and private facilities. Public-use facilities were those for which no charge was made for parking areas, boat launching ramps, picnic ovens and tables, and water and sanitary facilities. Several areas were selected for public use and the basic needs had been provided by the Corps of Engineers. There were also tent and trailer camp grounds and construction of a public bathing beach was being considered.

Commercial facilities on the government-owned lands were limited to leases of sites for commercial boat docks. Several leases permitted building cabins and other facilities on the reservoir property. A number of resorts had been built on privately-owned land next to the reservoir lands. Near the lake were a number of businesses dependent on tourists.

Commercial facilities at the lake had accommodations for about 250 overnight guests. About 225 boats were available for rent. Operators had invested approximately \$200,000 and the gross volume of business in 1948 was about \$68,000. Commercial operators in the vicinity who depended mostly on lake business had invested approximately \$200,000. The estimated gross volume of business by this group totaled about \$60,000 in 1948. Sales of sporting goods, groceries, gasoline, and other items in nearby towns increased as a result of the recreational use of the reservoir.

A number of cottage-site subdivisions were located on privately-owned lands. Early in 1949 about 65 cottages were constructed and new ones were to be added from time to time. The cottages varied from two or three-room structures to six

or eight-room buildings complete with central heating plants, bathrooms and other modern features. The estimated investment of the 66 cottage owners was \$230,000.

Besides boats owned by commercial operators, there were 300 privately-owned boats. The investment in private boats was estimated to be \$60,000. The foregoing figures show an investment by private interests of \$690,000 for recreation. The gross volume of sales to tourists at the lake or nearby was estimated at \$178,000 for 1948 and, according to indications would exceed \$200,000 for 1949.

Two organizations, the Southeast Missouri Boy Scouts and the 4-H Club Camp Association established group camps on the reservoir lands. Other lands were to be available to similar organizations on request.

Public Use

Since access to the reservoir was possible at several places, it was difficult to estimate the number of persons using the area. Records of concessionaires and estimates by reservoir personnel indicated that more than 75,000 people visited the reservoir for some type of recreation in 1949 (Table 31).

TABLE 31--ATTENDANCE ON VISITOR DAYS,
WAPPAELLO RESERVOIR, 1945-49

Year	General Recreation	Fishing	Hunting	Total ^{1/}
1945	10,000	15,900	1,200	27,100
1946	15,600	39,200	1,350	56,250
1947	15,750	47,000	1,450	64,200
1948	16,250	51,750	2,000	70,000
1949	17,250	56,000	2,500	75,750

^{1/} Figures do not include those persons who are considered as "sightseers" only.

Fishing and hunting were the major recreational uses of the area. Management and control of the fish and wildlife resources were delegated by license to the Missouri Conservation Commission in 1946. This agency initiated a management program which included biological studies of fish and planting of vegetation to attract game birds, particularly migratory water fowl.

The St. Francis River above Wappapello, Missouri, had been known as a fishing stream for many years before the dam was built. A creel census of a stretch of river above the dam site was made during the period June 18 to September 30, 1940, by Corps of Engineers personnel making one boat trip each day. The results showed 392 fishermen, who caught a total of 841 fish.

The impoundment from building the dam attracted a far greater number of fishermen. This increase was shown by creel census figures made by a representative of the Missouri Conservation Commission on April 17 and 18, 1949. On those two days, he examined the catch of almost 400 fishermen who used the commercial dock at Chaonia Landing. These fishermen had caught a total of 2,680 fish.

A study by the Missouri Conservation Commission of the number of fishing permits issued indicated 167 percent increase between 1941 and 1947, compared with 45 percent in four check counties of similar terrain (Table 32). Out-state permits in the four adjacent counties increased 535 percent compared with 7 percent for the check counties.

TABLE 32--INCREASE IN FISHING PERMITS SOLD IN COUNTIES ADJACENT TO WAPPAPELLO RESERVOIR AND IN SELECTED COUNTIES USED AS A CHECK, 1938-47

Counties	1938	1941	1944	1947	Percent Increase 1938-47	Percent Increase Over 1941
	Number	Number	Number	Number	Percent	Percent
<u>Total permits sold in adjacent counties</u>						
<u>Adjacent counties</u>						
Bollinger	712	743	833	1,364	91.5	83.5
Butler	2,334	3,714	5,335	9,710	316.0	161.4
Stoddard	1,810	2,151	2,965	5,887	225.2	173.6
Wayne	1,179	1,585	2,830	4,915	216.8	210.4
<u>Total outstate permits sold in adjacent counties</u>						
<u>Adjacent counties</u>						
Bollinger	13	9	13	38	192.3	322.2
Butler	64	98	161	533	732.8	443.8
Stoddard	21	42	54	255	1,114.3	507.1
Wayne	69	82	213	641	828.9	681.7
<u>Total permits sold in check counties</u>						
<u>Check counties</u>						
Carter	1,033	1,384	1,307	1,942	87.9	40.3
Madison	1,188	1,467	2,143	2,862	140.9	95.0
Oregon	571	1,237	1,347	1,847	223.4	49.3
Shannon	702	1,516	1,080	1,500	113.6	1/
<u>Total outstate permits sold in check counties</u>						
<u>Check counties</u>						
Carter	229	347	199	316	42.3	1/
Madison	58	49	83	128	120.7	161.2
Oregon	42	94	40	126	200.0	34.0
Shannon	148	252	89	212	43.2	1/
<u>Total permits for state</u>	283,742	393,790	378,603	596,653	110.3	51.5
<u>Total outstate permits for state</u>	23,086	22,680	15,856	34,337	48.7	51.3

1/ Small decrease.

Source: Data supplied by Conservation Commission.

Factors Retarding Development

Roads to the lake were unsatisfactory, largely because the government and the county did not work out a road relocation plan when the reservoir was started. Electricity and telephone service were lacking. The public demands these services. Operators who did not have them could not compete with those who did.

Another factor retarding development may be lease arrangements. Some operators said the government lease was unjust. The lease provided for payment of a flat fee plus a percentage of gross receipts from the business, including that on privately owned land. Operators said that this procedure reduced the incentive for them to expand.

Some resort operators felt that the fluctuation of the water level of the reservoir, which state health officials recommended as part of a mosquito control program, was detrimental to their business. A study was being made to see whether the operation of the reservoir could be modified and still give adequate mosquito control.

EFFECT ON THE AREA BELOW THE DAM

According to the findings of the Corps of Engineers, if the flood control program on the St. Francis was to include a reservoir, the most feasible plan was to use the Wappapello site, supplemented by levees between Wappapello, Missouri, and St. Francis, Arkansas. Effective flood control required the reservoir to be emptied within 40 days after a major flood. The size of reservoir would have little effect on flood heights below the foot of St. Francis Lake. Building Wappapello would bring economic and social impact upon the reservoir area and also on an area below the dam. The area affected would lie between the dam and the foot of St. Francis Lake.

Use of diversion projects was economically feasible only in area four, from the lower end of the St. Francis Lake to the mouth of the river. Channel enlargement was feasible only in the Sunk Lands from St. Francis, Arkansas, to Marked Tree, Arkansas. This limited the main impact of the reservoir to the area, which was to have the protection of supplemental levees, between Wappapello, Missouri, and St. Francis, Arkansas.

Supplemental Levee Construction

The flood control project authorized by Congress required that all lands, easements and rights-of-way for the construction of the supplemental levees be furnished without cost to the United States. The local situation was such that this provision as first passed had no chance of being fulfilled. Local drainage districts had given their assurance that this would be done, but actual fulfillment of this obligation was another matter.

By 1948 few, if any, of the proposed levees in Missouri had been built.

Several reasons can be advanced for this situation. They may be summarized as follows:

- (1) A few people did not know of the need for supplemental levees. They believed the reservoir by itself would give full protection. Therefore, some opposed the construction of the levees, and others made no effort to have them constructed.
- (2) Some land owners knew that the original plan called for the supplemental levees but hoped that such levees might not be needed. The relatively low, uniformly distributed rainfall in the first few years after the dam was built enabled the operator of the gates to hold the discharge down to 6,000 cubic feet per second. At this rate of discharge little or no land was flooded. Some farm operators were lulled into apathy for the levees by the false protection provided by only the reservoir. The rainfall pattern in 1945 proved the error of their thinking and the undesirability of operating the gates at 6,000 cubic feet per second, to protect the lands below the dam not protected by levees. This plan allowed too much water to accumulate in the reservoir during the spring rainy season. Run-off from some heavy rains pouring into the full reservoir resulted in water passing over the spillway to a depth of 4.3 feet. The uncontrolled discharge of something over 20,000 cubic feet per second resulted in considerable flooding below the dam. Had the gates been operated at their specified maximum rate of discharge all the time during the spring of 1945, it is estimated that no water would have flowed over the spillway. After this experience in 1945, the gates were operated as originally designed. Thus some of the land unprotected by levees was flooded since 1945.
- (3) In the areas where new levees were proposed, or the old ones were to be set back, local opposition had been quite strong. In some instances, large portions of some farms and even some farmsteads would have been located between the levee and the river. It was not difficult to understand why such opposition existed even though owners were to be reimbursed for their farms. Besides being forced to give up title to the land some of the owners believed that the price the local organization would pay would be considerably less than the current market price or what the owner thought his land was worth.
- (4) One of the most important factors was administration of the local government with which the Federal government had to deal. In Stoddard County alone, there were some 30 independent drainage districts. Some connected with the tributary of the St. Francis River rather than with the main stem. However, in the area between Wappapello and the St. Francis Lake there were 49 independent levee and drainage districts directly concerned with the proposed levee construction on this stem of the St. Francis River. Many were too small to finance more levee con-

struction. Some, as the Mingo drainage districts, were financially insolvent.

There were two reasons why some of the drainage districts would not be able to furnish land, easements, and rights-of-way free to the United States and still compensate the owner.

- (a) One was the basis of the initial organization of the districts. Those organized under the county court, which included many in Stoddard and Dunklin counties, were small. They tended to be organized according to small drainageways emptying into the St. Francis River. Some were as small as 10,000 acres and comprised the land lying next to a slough. These drainage districts were organized and the appraisals made in the early 1900's. Each 40-acre tract in each district was appraised in terms of the cost and benefits derived from the proposed ditch and levee construction. The main benefits were to come from drainage. The laws of the state specified that the original cost-benefit appraisal of all land within a district could not be changed during the legal existence of such district and taxes had to be levied as a percentage of the net benefits. Therefore, if the directors of some of the districts were to authorize a tax on the land in an effort to obtain money for the purchase of land, easements, and rights-of-way for the proposed levee construction on the St. Francis, the burden of the tax would not be placed in accordance with the benefits received. Benefits primarily from drainage would not be the same as benefits from levee protection. In addition, in order to raise sufficient funds in some of the districts, the taxes levied would have to be well over 100 percent of the net benefits appraised in the early 1900's. Although returns to land had increased in the area, land owners did not feel that additional expenditure of these amounts would be justified.
- (b) A second reason why these drainage and levee districts would not be able and should not be expected to furnish the land, easements, and rights-of-way was the very nature of the project itself. Not all tracts of land in the districts would be able to afford the cost of their share according to the geographical organization. This does not mean that all of the lands adjacent to the St. Francis River and subject to flooding taken collectively should not be able to bear the cost. It means that, under the prevailing system at the time of the study, it would be impossible to tax according to benefits received. Levees proposed in some of the districts really provide protection for districts further down the stream. Perhaps what would be needed if the levees were economically justified would be the creation of a drainage district covering the entire area adjacent to the St. Francis River below Wappapello and subject to its over-

flow. The cost-benefit appraisal would have to be made on the basis of the overall project and then taxes could be more fair in terms of the benefits received.

- (5) Another reason for the lack of local participation was the nature of the community organization in the area. Unity of community action and local rural leadership were not as fully developed in this area as elsewhere in the state. Because the construction of the levees called for community action in 49 different districts rather than individual action, few responded.
- (6) There was an important reason why more had not been accomplished since the United States had been authorized to reimburse the local districts for the lands, easements, and rights-of-way. The apparent interpretation of the act was that local interests would have to make the initial appraisal and purchase. When they had acquired the necessary rights and turned them over to the United States, the local interests would be reimbursed for what they, the appraisers for the United States considered a fair price. The leaders of the local organization feared there would be considerable discrepancy between the price the local district paid the owner for his rights and the price established by the representatives of the United States. Furthermore, local courts might require the local districts to pay for flowage damages on land between the levees and the river, while the United States might not pay for this damage. Courts might also require that the flowage damages be nearly equal to the full value of the land, while the United States might appraise them at a much lower value.
- (7) Lack of information on the part of the land owners and the attitude of indifference toward the people in the area by the Army Engineers did not expedite the construction of the levees. There was some question as to whether or not the officers of drainage districts had been fully informed about levee plans and construction programs. Even if these men were given all of the facts, there had been no well organized procedure for keeping all of the land owners in the districts fully informed.

Effects by Areas

The lack of supplemental levees had aggravated the flood situation in some areas. In other areas, new problems had developed.

Butler County. The construction of the Wappapello reservoir had little effect in Butler County. The St. Francis River forms the east boundary of this county and Arkansas forms the south boundary. The lowlands of the county start about three miles below the northeast corner of the county and run diagonally south and west to the southwest corner. Running down through the center

of the county from north to south is Black River. The slope of the land is from east to west. Years ago flood water passed over the banks of the St. Francis River and flowed to the Black River. A levee along the St. Francis river prevents frequent flooding in Butler County.

The lowland area between the St. Francis and the Black rivers was developed through the promotional work of one large concern. This was a fortunate situation in many respects. The swamp and overflow lands were given first to the state of Missouri by the United States and later to the county by the state for reclamation. These lands were handled for the most part by the county court. A considerable portion of the land was granted to the Iron Mountain and Southern Railroad in 1870. The remainder was offered for sale at \$1.25 an acre. A large tract was purchased by a subsidiary of the American Sugar Refining Company for lumbering purposes. One of the provision of the sales contract was that after the timber had been removed, the Company would drain the land and sell it for a reasonable price. The total area of low land between the St. Francis and the Black River is about 130,000 acres, of which 90,000 acres were owned by the lumber company. The acreage purchased for lumbering was soon placed under control of the Great Western Land Company. A drainage district was organized in an effort to reclaim the land for agricultural purposes. The Great Western Land Company organized the entire area between the St. Francis and the Black River into one large district known as the Inter-River drainage district.

The Inter-River drainage district built a levee the full length of the county protecting all of the lowlands along the St. Francis on the Butler County side. Construction of drainage ditches and levees began in 1916 and the levee along the St. Francis River was finished soon thereafter. Since this levee was constructed, little or no flood water from the St. Francis River has flowed over Butler County.

The one area in Butler County affected indirectly by the St. Francis River and the reservoir was adjacent to the levee south and east of Qulin. Original plans for draining the area called for a ditch, number 30, to be built parallel to the river and to cut through Qulin ridge to carry water from the watershed north of the ridge to the watershed south of the ridge. Eventually it was to join a ditch in Arkansas. This matter of carrying water from one watershed to another was the basis for a temporary injunction by the state of Arkansas in 1917, later made permanent. As a result, the section of the ditch through the ridge had to be plugged and a ditch running west along the north edge of Qulin ridge was cut to provide an outlet for the upper end of ditch number 30. This ditch eventually drained water into the Black River. Because of this change in plans the outlet for ditch 30 was somewhat less efficient than the one originally designed. Consequently, surface water tended to accumulate in that area south and east of Qulin without an apparent outlet. At one time metal tubes with flood gates were installed in the levee to allow the surface water to drain off when the river was low. When the gates became rusted and inoperative, the pipes were

cemented shut. The surface water then accumulated and had no place to drain. Holes have been blasted in the levee along the St. Francis River from time to time so that the surface water could drain off. Besides being illegal, this practice had resulted in flooding of some of the sections of that area by the St. Francis River when it was more than bank full.

The area in Butler County affected by the reservoir was the land farmed between the levee and the river. There were about 2,500 acres between the levee and the river, of which fewer than 1,000 acres were cleared and usually cultivated. Since 1945, these areas had prolonged floods in the spring. Before the construction of the reservoir the areas were flooded, but the flood waters came up rather quickly and receded in a short time. When the reservoir gates were operated according to the recommended plan, most of the acreage was flooded for a considerable length of time. The water was not as deep but it stayed on the land for a longer period and made it more difficult to farm.

In addition to the sustained flooding, other difficulties had arisen for farmers of these areas between the levee and the river. In Butler County most of the earth for the levee was obtained by digging a ditch inside the levee. A 20 foot bar was left about every 600 feet to prevent currents in the ditch. Floods soon cut these bars away and in many places the ditch served as a substitute or supplemental channel of the river. Thus, when the water fell below the level of the cultivated land, the ditch was a barrier to the farmer who wanted to tend his land. Some farmers who had rather large acreages had gone to the expense of a bridge across the ditch. Those who could not afford to build a bridge had to wait until the ditch was dry enough to cross.

In Butler County few, if any, of the operators complained of seepage. There was little or no sandy land adjacent to the levee in this county, which practically eliminated the possibility of seepage.

The prolonged discharge of water in the river channel seemed to be having some adverse effects on the channel itself. No water-flow data were available, but general observation seems to indicate that the capacity of the channel was being reduced. Because the river was held at a stage that made it bankfull or more for long periods of time, the banks became thoroughly saturated. When the water receded, the banks had a tendency to cave in and large trees along the banks sank into the river. This reduced the capacity of the channel and forced water into other courses such as the bar pit ditches just inside the levees. The ultimate effect of this situation should be given careful study.

Stoddard County. In the lowlands areas of Stoddard County there was lack of drainage and floods were caused by water from the St. Francis River and by surface runoff. Many farms within the drainage districts were inadequately drained, yet owners were paying drainage taxes. Laterals were needed on many farms throughout the drainage area. A large part of the trouble rose from the fact that existing drainage ditches were not maintained. They had grown up in willows and clogged with silt. Drainage districts became financially unable to

undertake redredging during the depression. When work began following the depression, dredging certain ditches caused a more rapid flow of water through them. This resulted in more serious overflows farther down the drainage system.

This experience pointed out the need for a coordinated system of drainage control maintenance not only in Stoddard County, but covering the entire drainage area. Lack of cooperation between farms and drainage officials in keeping ditches free from obstruction and their failure to use practices which would prevent ditch banks from caving in or silt from washing into the ditches from adjoining fields made maintenance of the drainage system cost more. Another reason for the high cost of maintaining the drainage ditches was the large number that were draining the area adjoining Crowley's Ridge. Silt coming down the slope was deposited in the ditches as the velocity of the water was checked, causing the ditches to fill up rapidly. Because drainage ditches traversed the entire length of the county from north to south, some areas of low productivity were included in most drainage districts. The taxes on some of this land were excessive in relation to income. For this reason some land had been abandoned.

Much damage from excess water occurred during the rainy season. The cause, however, may not have been related to the flood waters of the St. Francis River. To be certain of the cause of losses in many areas would require considerable additional study. There were in Stoddard County three general areas known to be affected by the St. Francis River and the reservoir. They were the Mingo Basin, the St. Francis Bottom, and Green Oaks (Figure 4).

The portion of the Mingo Basin affected in Stoddard County was a narrow strip of land from two to three miles wide extending along the Wayne and Bollinger county line. Here farm land was small cultivated tracts interspersed with cutover timberland. The soils were Waverly and Calhoun clay, much of it known locally as "crawfish" land. The drainage was poor both on the surface and through the sub-soil, and productivity was low. Drainage ditches were needed for the land to be suitable for farming. The cost of these ditches was beyond the productive capacity of the land, most of which was in the Mingo drainage district. Payments on the bonds of this district had been delinquent for years because of the facts cited here. They had been and were still being bought from year to year by some landowners in the district at a price equal to 8 to 10 percent of their face value. The land owners applied the bonds on their drainage taxes. Ditches in the district were in a deplorable condition, having had no maintenance or construction work for a long time.

Most of the area in the Mingo Basin was purchased a short time before the study by the federal government and was being operated by the Fish and Wildlife Service. The entire refuge contained 22,000 acres, mostly in Stoddard County. A small section lay in Bollinger County. The Fish and Wildlife Service contemplated building a 208-foot spillway with two radial gates. This structure would enable the Service to flood about 15,000 acres for a game refuge. About 3,000 acres of crop land, mostly in Stoddard County, was located in the area.

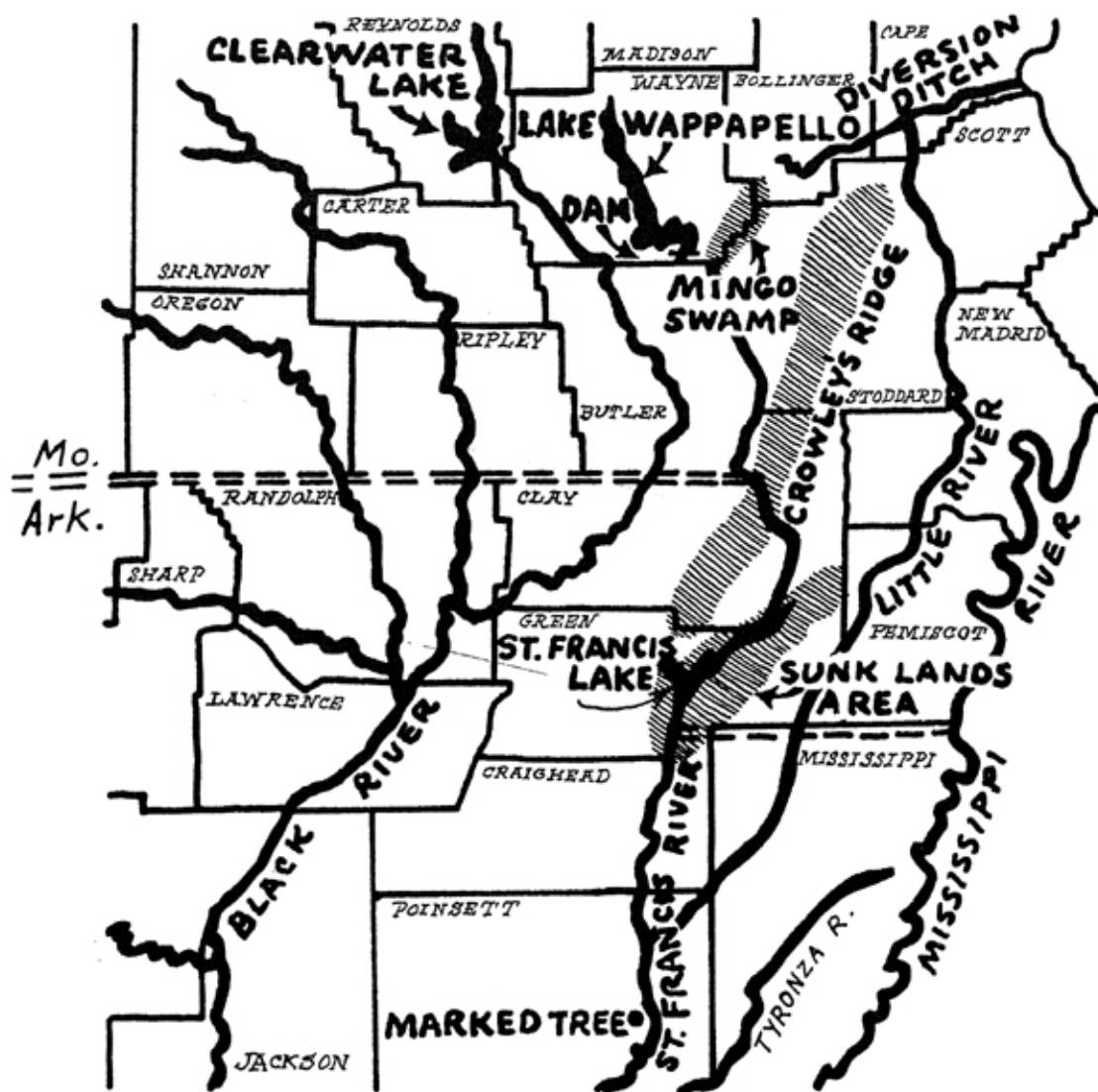


Fig. 4—Location of Lake Wappapello and areas in the lower St. Francis River Basin where the reservoir influenced drainage.

The Fish and Wildlife Service had a cooperative agreement with farmers for the use of this crop land; therefore, a recommended land-use program had to be followed. For grain crops, the Service either required the cooperators to leave a portion standing in the field as feed for wildlife or to harvest the share belonging to the Service and store it in bins in the area.

The purchase of land in the Mingo Basin by the Federal government removed from private ownership practically all of the Mingo Basin area subject to flooding from the St. Francis River. A new problem may develop below the area. In the years just before this study, ditch number 15 had not been properly maintained and according to some observers it was not large enough to carry the run-off. If the entire basin is dammed and the spillway allowed to discharge into ditch number 15, there may be more water than the ditch can carry, especially if the discharge at the mouth of the ditch is held back by the St. Francis River.

The area known as the St. Francis Bottom lay immediately below the Mingo Basin and extended as far south as Fisk. The principal soils here were Calhoun and Vicksburg clay loam. The St. Francis Bottom contained small areas of high and fairly well drained land similar to the Dudley Ridge. The remainder of the area would produce good crops only with a satisfactory drainage and flood control system. Drainage ditches extending into the territory west of Kinder traversed this district and emptied into the St. Francis River south of Fisk. In periods of excessive rains surface flood waters passed down these ditches through the Mingo Basin in larger volume than the drainage ditches could carry, causing water to spread out over the entire low lying area. Future farming operations require that these flood waters be controlled in some way.

Soon after the Mingo drainage district was organized, a levee was built adjacent to the St. Francis River. The levee was not as large nor as high as the levee on the Butler county side. When the floodway became more than bank full the flood waters poured over on the Stoddard county side. The flood waters of 1927 cut many holes in the levee which were never repaired.

After 1945, during periods of heavy runoff, the St. Francis River was maintained at a level that frequently flooded some of the lowlands outside the old levee. The area affected probably did not exceed 3,000 acres of the St. Francis Bottom area in normal times. Only about 40 percent of the land was cleared.

Farmers in this Bottom area registered the same complaint as in other areas subject to flooding. The water did not get as high as before the reservoir was built but it remained on the land longer. In some cases crops were killed if they were reaching maturity when the water stood around the plants. In addition, farmers believed that flood waters no longer carried silt as they did before the reservoir was built. The farm land had to be fertilized if productivity was maintained.

Farmers of land between the levee and the river experienced the same difficulties as those of Butler County. The acreage inside the levee was not great,

but included some of the most productive land in the area.

The area known as Green Oaks was a timbered section located along the southwest edge of the county extending into and dividing Dudley Ridge. Only small tracts making up less than 40 percent of the total area were cultivated. The area was low, flat and poorly drained both on the surface and in sub-soil; productivity was low. The land use planning committee believed that the area was unsuited for farming. If the water were drained off and the land cleared, productivity would still be low and returns would not justify paying the drainage tax levied against cultivated land. The committee in 1941 recommended that this area remain in timber.

The disposition of surface water here was a problem. Drainage ditches could not empty into the St. Francis River when it was running bank full. Consequently, water backed up the drainage ditches and stood on the lowlands until the river went down. This condition existed for as long as a month, depending up the amount of rainfall and runoff. Flood waters allegedly stayed on the land for seven weeks in 1945.

According to farmers in the area, one of the influences of the flood water resulting from the high rate of discharge at Wappapello plus breaks in the levee, was its detrimental effect on permanent pasture in the lowlands. Because the water often stayed on the land for a long time, farmers felt that fewer strains of native grass survived. The pastures were much poorer. Some of the more progressive farmers in both the St. Francis Bottom and the Green Oats area who tried to use pasture as fully as possible had to reduce their livestock enterprises because the flood waters had reduced the carrying capacity of the pasture.

Dunklin County. Dunklin County is located immediately below Stoddard County. The St. Francis River forms the western boundary and Arkansas the southern boundary. With the exception of Crowley's Ridge, the county is mostly fertile alluvial soils. Heavy stands of timber had to be removed and drainage provided over half of the area before the land could be cultivated. Most of the lowlands have been farmed for a relatively short time. Even though the topography of the county is level, except Crowley's Ridge, and water erosion is not a problem, soil fertility has declined rather rapidly, especially on the sandy soils.

Two general areas in Dunklin County were affected by the Wappapello reservoir. One was located in the northwest corner north and west of Crowley's ridge. This area was commonly referred to as the Glennonville and Wilhelmina communities. The other was the Varney River area west of Kennett.

There were approximately 33,000 acres of level land in the Glennonville and Wilhelmina area. About 10,000 to 12,000 acres along the St. Francis River was slightly lower than the rest. Most of this section was subject to frequent flooding. Only about 40 percent was cleared. Most of the soil was light in color and eight inches or less deep. A tight impermeable sub-soil was characteristic of about 75 percent of the area. The predominant soil type was Calhoun silty clay loam. Oliver silt loam was found along the area adjoining Crowley's Ridge. The

tight sub-soil added to the problem of drainage.

Water from the St. Francis River covered a large part of this area in times of flood. In addition, runoff from the east side of Crowley's Ridge drained into the area. Drainage was one of the major problems on about 5,000 acres around Wilhelmina. The land was being farmed but needed more drainage since the land was subject to flooding from surface water. However, even if drainage ditches were constructed, back water would continue to be a problem on much of this land, if the St. Francis River was held above bank full stage and no levees were provided.

The St. Francis River had menaced the Glennonville and Wilhelmina area with floods for many years. People in the community thought the Wappapello reservoir would solve the problem. However, in connection with the Wappapello dam a levee was proposed which was to start six miles north of Highway 60 in Stoddard County and extend south to a point near Wilhelmina. About two-thirds of the Glennonville-Wilhelmina area would lie between the levee and the river. With the completion of such a levee some proponents of the plan believed that an additional 200,000 acres of land would be drained by ditch number 12, the only main ditch in the area. This ditch was not adequate to take care of drainage of the area for which it was originally intended. The people in the Glennonville-Wilhelmina area had opposed the construction of the levee. More study will be necessary before it can be said whether or not levees are economically justified.

The effects upon agriculture here were similar to those in other areas. Because there were no levees in the area, flooding from the St. Francis River occurred whenever the river was more than bank full. This condition was aggravated by the large amount of surface water draining into the area. The water perhaps did not get as high as it did before the construction of the reservoir. But, the difference in height appeared less here than in other areas along the St. Francis River in Missouri. The location of this land in the bend of the river and the impediment of the river itself, when at flood stage, to the drainage of surface water from Crowley's Ridge, may have caused floods to be nearly as high as before. In addition, the water stayed on the land longer than before and made farming more difficult.

The second area in Dunklin County affected by the St. Francis River and the reservoir was the Varney River area. A good levee started from the highlands of Crowley's Ridge west of Campbell and extended south below White Oak. An older, lower levee that had been broken by past flood waters lay between this levee and the river. The newer levee, constructed in the 1920's before the 1927 flood, had been well maintained. This new levee prevented any flooding in the area in 1927. Because the 1927 flood was about as large as any on record, there seemed to be little reason to believe that the reservoir had any influence on the area. There was flooding along the Varney River, below here.

The Varney River area that was most seriously affected by flood waters

from the St. Francis River started a few miles north of Kennett and ran as far south as the area west of Senath. The dominant soil type was Waverly silty clay loam with small areas of Lintonia fine sandy loam and Lintonia very fine sandy loam. Drainage was one of the major problems. This problem was further complicated by the difficulty of discharging local drainage into the river when the flow was maintained at more than channel capacity. As many as 8,000 acres in this area were affected by the St. Francis River. In some places only 30 percent of the land was cleared. The old levee was of little value and contained many breaks. Levees were not adequate to hold the flood waters in 1927 and consequently they were damaged in many places.

The same complaints were made here as elsewhere. Because there was not sufficient fall, surface water could not escape. The St. Francis River was controlled at such a level that it frequently ran more than bank full and flooded some of the lowlands. Since soybeans and corn were the major crops, planting time was delayed to avoid replanting. Corn could be planted as late as July 4 if early maturing varieties were used. The water perhaps did not get as high as it did before the reservoir was constructed, but it stayed on the land longer.

Proposed levees in this area were to set back from the old levees to provide a wider flood channel. In some places this setback was to be more than a mile. Most of the owners inside the levee, of course, were opposed to the new site. They felt that the old levee should be repaired and strengthened.

In the lower portion of the county the levee system was more effective and there was little trouble from overflow because of less headwater. The flood waters really came from the water which overflowed from the Varney River section and followed down some of the drainage ditches. Some seepage was reported in the lower area. Small areas of sandy land lay adjacent to the river so that seepage may have been a problem. Additional study is necessary to verify the findings.

Other Effects

The operation of the reservoir gates, according to a plan recommended by the U. S. Public Health Service for mosquito and malaria control and the State Conservation Commission to preserve wildlife, was not always in harmony with the best interests of farmers. The approved plan called for a relatively stable water level later in the season. Thus, if some rather heavy rains occurred in the watershed, it would be necessary to open the gates and allow a discharge of more than 5,000 to 6,000 feet of water per second in order to maintain the desired water level. This rate of discharge would cause the river to run at bankful stage or higher below the dam. A rate of discharge above 6,000 cubic feet per second would mean that some farm land would be flooded. This flooding during the time of year when it would be reasonably safe to hold the discharge down to 5,000 cubic feet per second was difficult for the farmer to understand, even if he was familiar with the plan of operation.

Most farmers seemed to know little or nothing about the operation of the

gates. What they heard was usually not true and led to considerable discontent. Besides the periodic rise and fall of the water level in the river resulting from an attempt to maintain a fluctuating, declining water level in the reservoir had led people in the area to think that the dam was being operated for sportsmen. This was particularly true if the pattern of rainfall happened to be such that the engineer at the dam was forced to open the gates during the weekend. The lack of information and understanding on the part of the local people did not help dispel the idea quite generally held that the Wappapello Reservoir was being operated for sportsmen from St. Louis and other surrounding towns.

General Considerations

The construction of the Wappapello Reservoir has created some problems of flood control below the reservoir. Some problems are new; others are modifications of old ones that existed before the reservoir was built.

The hazards of farming land between a flood control levee and the river should be recognized. If the owner of the land at the time of construction receives fair payment, then the public agency which may influence the amount of water flowing through this area should have no responsibility to an individual wishing to use the land. The user of the land must bear the entire risk. If reasonable efforts are made to inform the local people regarding ownership and use of the land, then they should have no recourse nor should there be any basis for complaints against the public agency.

The decision to adopt a flood control plan as it is related to levees in which the local people have a responsibility should be made by a majority of the people directly concerned. There should be as much local participation as possible. The administrative limitations of the local units must be recognized. If the local organization is not designed to facilitate local participation, the state should take the initiative in developing an organization to expedite the plan. When local participation is desirable and necessary, people should be informed of their responsibility. They should indicate their acceptance of this responsibility by setting up an organization to deal with problems involved.

A plan for flood control cannot be handled piecemeal. When work begins on a project, all the complementary and supplementary phases should be completed. Otherwise, there may be greater loss than if no plan is adopted. The problem of disposing of surface water should be thoroughly studied and solved before final plans for new projects are approved. Control of floods on main streams may provide no net benefit if they increase flooding on tributaries.

In analyzing the resources of a flood plain, more consideration needs to be given to economic aspects. The plan for flood control adopted in 1936 was based upon a favorable over-all cost-benefit ratio. Implementing the project called for costs of land, easements and rights-of-way to be borne by local units with no attempt to balance them against the benefits which these same units would receive. It seemed that in the area immediately below the Wappapello dam in-

sufficient consideration was given to the productivity of the land. Agronomists, soil scientists and economists should be members of the team which studies the problem of floods and the measures for control.

The analysis of a flood control project should be reviewed by an impartial board of specialists who attach their findings before the project is submitted to Congress. There is some question in the mind of the author concerning the accuracy of the estimated benefits of flood control projects in the St. Francis watershed. One of the main problems which may be common to many areas, is differentiating between losses resulting from excess surface water and losses from flood waters of the St. Francis River.

The results of this investigation, above as well as below the Wappapello dam, indicate some of the many problems associated with flood control. It is possible that control of flood water in one area causes problems in another area. In light of the findings, it would certainly seem wise to approach with caution the control of flood waters on main streams by the use of dams. Perhaps it would be best first to study the full effects of the dams already built; to check the accuracy of the estimated benefits and costs; to seek solutions of the problems created by their construction, and to test possible alternatives to this method of flood control.

SUMMARY AND CONCLUSIONS

This study was undertaken to determine whether the effects of the implementation of a policy to attain a specific goal were consistent with the goal itself. The assumed goal was the maximization of social product over time. The program that was designed to achieve this goal was the construction of a detention reservoir and levees to control floods with Federal and local funds. The specific project was the Wappapello Reservoir on the St. Francis River in Wayne County, Missouri, and levees to St. Francis, Arkansas. The study was made twelve years after the Congressional Act authorizing the construction of the project was passed. Both economic and social aspects were investigated. Although it would be impractical to study the total impact of the project, the area directly affected was not too difficult to delineate. This area included the purchase area involved in the detention reservoir, the local government units affected thereby, and the area below the dam directly affected by the water discharged from the reservoir.

The people in the reservoir area and the area between Wappapello and St. Francis, Arkansas, did not receive adequate information about the plans for the reservoir and levees and how these flood control levees would affect them. This made it difficult for the people to plan ahead for their own personal lives and for modification of community organizations.

Landowners in the Wappapello purchase area found the methods of land acquisition unsatisfactory. Neither the appraised value nor the appraisal method was explained to them. With no value to use as a guide, the method of price

negotiation was a frustrating experience for the owners. In some cases notice of acceptance of an option was not given until nearly a year after the negotiation.

The condemnation procedure was time consuming and costly to the people. There was inadequate communication regarding time of trial. Some owners said they accepted less than they thought their land was worth because they did not wish to go to the trouble of a court trial.

A larger number of the landowners were more dissatisfied with the method of land acquisition than with the price they finally received. Using the value set by government appraisers as a base, the landowners, who sold for less, received an average of 93 percent of the appraised value. Those who carried their case through condemnation procedures received 144 percent of the appraised value.

There was considerable delay in payment. In some cases it was as long as three years after the option was accepted. The time between appraisal and payment averaged from three and one-half to five years. In some cases the delay was because of faulty title. In others it was because of condemnation procedures. In general it seemed that inadequate arrangements had been worked out for making prompt payment.

Relocating people and restoring their economic and social institutions involved costs other than the land and immovable capital. Local people were not compensated for moving expenses, cost of relocation and other disturbance costs. It was difficult to find situations comparable to the ones they had been accustomed to.

They spent considerable time trying to find a new location. Only 40 percent of the farm families forced to move from the area were still farmers in 1948. One-sixth retired and about one-third went into other occupations. Of those who continued to farm, about two-thirds made good farm selections. They had to change from livestock farming to cash crops when they moved to the county south of Wayne.

Opportunities for land owners to relocate quickly and easily were hampered by three factors. One was the long delay in receiving payment. A second was the steady and, at first, slow but later rapid rise in land prices. The third was the rather abrupt increase in the number of buyers in the land market immediately around the Wappapello area.

Management of the public land within the reservoir area was inadequate. There were 35,092 acres above the 362 foot elevation. This area, although subject to occasional flooding, was available for leasing for agricultural and recreational purposes. Little or no effort was made to classify this land according to its best use. No effort was made to combine tracts classified as agricultural land into units convenient and economical to operate. Arrangements for supervising timber resources had just been worked out.

A number of farm buildings located in the area were available for leasing. No program for maintaining these buildings was worked out until the fall of 1948. The new lease form used then made the tenant responsible for keeping

buildings and improvements in as good a state of repair as when he assumed the lease.

Land above the 362 foot elevation was leased, if the rent offered was equal to or above 2 percent of the purchase price of the land. Three methods of awarding leases were used. Preferential leases were offered to former owners or lessees of adjoining property. The remaining area was publicly advertised and awarded on the basis of the highest sealed bid. The amount of rent on tracts for which no satisfactory bids were made was negotiated. The term for all leases was five years. Small isolated tracts and those located in the less productive areas with houses and other improvements were leased by part-time and subsistence farmers. The large tracts and those in the more productive areas, although subject to some flooding as a direct result of the dam, were leased for the most part by full-time commercial farmers who lived outside the purchase area. The living standard of families residing in the reservoir area was somewhat lower than that of the families living adjacent.

Relocation of the urban sector was handled rather efficiently. The organization of the Greenville Improvement Corporation contributed substantially to solving problems of relocation. The services of the State Planning Board and the National Resources Committee were obtained. In spite of the amount of planning done, some residents remained in old Greenville in houses located at higher elevations and some started a second town called Kailville. Urban and business owners were compensated for their land and fixed capital but they too received no compensation for costs of relocation. The shortage of materials due to World War II and curtailment of Public Works expenditures resulted in incomplete development of public facilities in the new town.

The removal of privately owned lands from the tax rolls cut county and school funds. To make up for this, part of the rental income received by the Federal government was turned back to the county. Before 1946 this was 25 percent of the amount received. During 1946 it was raised to 75 percent. By 1948 the sum turned back was approaching the amount lost by the reduction in the tax base. In the early years of the project county funds for roads were short. In an attempt to provide sufficient funds, assessments and the tax rate were both raised. Schools, on the other hand, were able to draw a larger sum from the State Equalization Fund. The county received payment for roads destroyed but there was considerable delay in payment. Four school districts were abandoned, with no one authorized to handle orderly liquidation of assets and liabilities. The reservoir made necessary a major reorganization of school districts and road systems. Adequate plans were not worked out before they were needed, nor was there evidence that complete plans were available.

Use of the Wappapello reservoir for recreation increased considerably. A master plan was not prepared until 1946. Inadequate roads and utilities were the main deterrents to development.

The plan for flood control on the upper reaches of the St. Francis as authorized by Congress in 1936 included the use of levees below the Wappapello dam to St. Francis, Arkansas. This authorization required that land, easements, and rights-of-way be furnished free of cost to the United States government. Promises that the rights-of-way would be provided in many cases were not fulfilled. In 1946 the law was modified to allow the government to take title to land needed for levees.

By early 1949 little, if any, levee construction had been started in Missouri. Little pressure was exerted for completion of the original plan. There were numerous reasons for this apparent indifference. Not all parties concerned knew that supplemental levees were necessary as part of the adopted plan for flood control. Some believed that the reservoir itself would provide all the protection needed. The plan was opposed by many whose farms would be located between the proposed levee and the river. Local organizations had to raise funds to buy lands, easements, and rights-of-way with taxes. These were to be levied according to assessments based on benefits derived from drainage districts organized in the early 1900's. The funds that had to be raised were in proportion to each district's mileage of levee rather than in proportion to the benefits received. Thus, the tax burden among districts was not in accordance with benefits received. Unity of community interests and action and local rural leadership were not strong enough to successfully operate the plan even if without opposition.

Little progress was made in Missouri even after the law was changed so the Federal government could take title to the land, easements, and rights-of-ways for levees. Local organizations felt there could be considerable discrepancy between the price they would have to pay through court awards to owners and the price the Federal government would in turn pay to the local organization. Lack of up-to-date and accurate information by the owners and lack of contact by the Army engineers had not helped to expedite the plan.

Farming of the land between the levees and the river was apparently more hazardous than before the reservoir was constructed. Flood waters were perhaps not as deep but they stayed on the land longer. The prolonged saturation of the banks of the river caused them to cave in when the water receded. Large trees also fell into the edge of the stream, reducing the capacity of the channel and choking it with logs. Consequently, more water was forced outside the channel, and much of the water flowed down the bar pit ditches. This situation made it difficult for the farmer to get to his fields and added to cost of production and to the danger of losing crops. Some of the land protected by the levees was adversely affected by the Wappapello Reservoir but most of it was benefited. The effects varied because of unique situations arising from characteristics of soil, topography and political and social factors of each area.

Below the dam which created the Wappapello Reservoir, problems require more engineering, soils and economic studies. A major problem is the flood hazard from accumulated surface water which has no outlet as long as the river

is controlled near the bank-full stage. Another is the economic feasibility of the proposed supplemental levees. A third is the problem of local government organization. A fourth is the problem of acquiring and transferring titles for the supplemental levees by local units to the federal government.

RECOMMENDATIONS

The premise that public policies should be designed to improve the conditions under which people work and live is a logical basis for many types of publicly supported programs. Examination of the implementation of the Wappapello dam and levee project for flood control indicates that some unnecessary and undesirable hardships were imposed upon the people in the area affected. These impacts were not consistent with, but contradictory to, the basic goals. It is possible for these undesirable effects of implementation to be kept to a minimum and for conditions to be improved to a maximum by using improved techniques to determine fair compensation to people whose property is damaged and through fair charges to those who buy this property.

The recommendations suggested to improve the techniques of implementation are divided on the basis of the organization which could or should take the initiative for the improvement.

For Consideration by the Federal Government

The Federal government should assume the initiative, in cooperation with state and local units of government, in informing the public about plans that in any way affect the relocation of people. Despite the possibility of developing opposition as a result of revealing the information, people cannot make satisfactory plans for their future economic and social activity if they are not kept informed.

Provisions should be made for organizing and appointing an advisory committee of local citizens to facilitate the adjustments of relocation. Depending upon the size and economy of the area, it may be advisable to have both an urban and a rural committee.

Where property is taken, the method of appraisal should be explained to the owners. The appraised value should be given to each owner and the basis for the value discussed with him. The basis for compensating an owner should be the cost of locating, purchasing and moving to comparable property. He should also be paid for loss of income until the new business is established. This basis of valuation should take into consideration the effects that relocation of farmers, urban business establishments and urban residents will have upon the land and capital markets.

Owners of property should be notified as soon as their options have been accepted. In addition they should be paid as soon as possible after a clear title is established. This will keep to a minimum hardships that may arise from changes in land values over time. The owner will then be able to make at least a down payment as soon as he locates a new place. If condemnation procedure is neces-

sary, court should be held in the area where the people are being displaced. Such land should be taken through the "Declaration of Taking" procedure so that advance payments can be made to the owners. This procedure will enable the owner to make a down payment on a comparable property, in the event condemnation takes time.

People who are forced to move from an area should be compensated for the cost of moving. This payment could be a combination of a minimum flat fee plus a percentage of the value of the personal property moved. Thus renters and laborers as well as land owners would be compensated for displacement. The amount of the flat fee and the percentage should be subject to negotiation by the local advisory committee and representatives of the Federal government. Thus the amount decided upon could take into consideration changes in the level of prices and the local situation regarding the cost of moving and relocating the people who are displaced.

If landowners wish to retain their ownership status, they must purchase new properties. Such purchases involve direct costs of title transfer. Because the owners have been forced to give up their land, they should be compensated for the normal direct cost of obtaining title to new land. Items included would be a nominal fee for drawing up the contract, examination of the abstract and fees for the recording of deeds and other instruments.

Lands in the purchase area and immediately adjacent to it should be classified according to economic use at the time of appraisal. Such a classification would reveal the possibility of areas becoming isolated and uneconomical for private ownership as a result of the construction of the dam and reservoir. Such tracts should become a part of the purchase area. It also could be the basis for a sound land management program for the public lands, after transfer of title to the flood control district or other governmental unit.

After the title to the land is obtained, the management of the resources of the area should be placed under the supervision of a qualified person or agency. For example, land classified for forestry should be managed by a qualified forester. This could be accomplished either by hiring a forester by the Corps of Engineers or by transferring the responsibility of management to the U. S. Forest Service.

To minimize severance damages, the purchase of more land than is needed for the reservoir may be necessary. All marginal and supra-marginal land not needed should be sold. Sub-marginal land may be transferred to other Federal agencies responsible for such land.

Land classified for agricultural purposes should be managed by a qualified agriculturist. Tracts of land should be combined and leased in such a manner as to bring about efficient use of resources.

The land manager should be permitted to negotiate lease contracts. As an aid to the manager and to minimize criticism, a local advisory committee should be organized, made up of three or five men with not more than one lease holder

of agricultural land as a member. This committee would advise the manager on the amount of rent, the lessee that should be accepted and general management practices. Leases should be automatically renewable annually as long as the lease holder follows good management practices. Pending the suggestions of the advisory committee, dislocation may be minimized by leasing to former owner-operators and tenants wherever practical. Preferential leases to former owners who have no intention of operating the land should be discontinued along with awarding leases to the highest bidder on the basis of sealed bids.

After acquisition, all buildings and improvements should be appraised on the basis of need for them in terms of efficient use of resources. Buildings not required should be sold and removed or destroyed. The maintenance of all other buildings should either be the responsibility of the federal government and the cost reflected in the rent charged or provided for in the lease contract.

Alternative methods of settlement should be provided local units of government. Counties, cities and schools should have a choice of a cash settlement or adequate replacement of such items as roads, public buildings and other facilities whenever relocation and construction are feasible.

Planning service should be provided for villages and towns that need to be relocated. If the state has such a service, the expense should be included as a part of the total cost of the reservoir. If not, the service should be provided by a qualified public or private agency and the cost included as a part of the development expense.

The use of a flood control reservoir for recreational purposes should be accepted. The operation of the project for its major objective, flood control, should not and need not be affected. However, because of the limited facilities available for boating and fishing, use can and will be made of the conservation pool unless prohibition of such use is imposed and enforced. A plan for recreational use should be prepared early in the development of the project and before land acquisition. Local people should be informed and have a chance to take part in planning and executing the work. Efforts of Federal, State and local governments should be coordinated to provide roads and facilities for recreation.

Land use projects disrupt services other than roads and schools. Federal laws need to be amended to provide use of rental return for general county purposes as well as for schools and roads.

Concerted efforts should be made to coordinate the various policies of the federal government concerned with maximizing social product over time. Re-establishment of farm families, villages, schools and even county units should be avoided when such re-establishment would obviously be perpetuating an inadequate resource combination situation. Projects like the Wappapello Reservoir give people an opportunity to remove obsolescence and inadequacy both from private enterprises and from governmental units. Leadership at all levels, federal, state and local, should assume the initiative in taking advantage of this opportunity.

An alternative to projects like the one described here would involve withdrawal from private ownership land subject to frequent inundation. This would be accomplished by such land being purchased by the Federal government. The land would be classified according to its best use and that part of it which is desirable from the standpoint of income under the use restrictions needed could be leased to private operators with the government assuming no responsibility or risk for flood damage. Investments in buildings and other types of improvements not required for actual operations and residence within the area would be prohibited. This method could be more expensive than other alternatives, and might not be feasible on the largest streams such as the Mississippi. Nevertheless, alternative programs should be studied thoroughly, if perpetual drains on public funds by pressure groups are to be avoided.

For Consideration by State Government

The state should keep itself fully informed of the land use project proposals of the Federal government. It should be ready at all times to cooperate with the federal government in informing the public about plans that will in any way involve relocation of people.

Assistance should be given in establishing advisory committees of local citizens to facilitate local adjustments. The agency responsible should be the office directly concerned with the overall supervision of efficient use of resources in the state. Because of the informational and educational nature of the problem, the state university should also assume the initiative in the organizational and educational work that needs to be done. This work can be carried out through the Agricultural Extension division of the Land-Grant institutions.

Technical service to local committees should be provided. This would take the form of city planning for villages and towns that need to be relocated. Land classification and land management information should be provided for the local agricultural advisory committees. The State Division of Education should be able to consult with and advise local governments on adjustments of road systems as they relate to efficient operation of schools and use of taxes and rental returns. In general, any state or Federal agency which can provide technical assistance should assume the initiative in offering its services.

For Consideration by Local Governments

As soon as the final decision has been made regarding a land use project, local officials, leaders and people generally should take the initiative in adjusting their governmental and community services as rapidly as possible. Local committees organized to handle specific problems and to marshal the technical help of state and federal agencies can do much to aid in relocating people and facilities and institutions that serve them. This procedure would greatly reduce the adverse effects of the project on the community.

When towns or villages have to be relocated, the various alternatives should

be studied carefully. One possibility may be to move to a nearby city, rather than relocate the original town as such. The problems likely to arise if two or more villages are established should be avoided. If relocation at a new site is the solution, technical help should be used to design and establish the new center.

County governments and school districts should develop plans to utilize rental returns from public lands. The plans developed should be based upon expected needs and should provide for the necessary adjustments as a result of the relocation of the people and their business establishments. If possible, there should be some general plan developed before land acquisition is begun.

People who remain in the area should consider the advantages that can come from rural zoning. By use of this technique it may be possible to bring about a more desirable development of privately owned land around the reservoir. Expenditures for roads and schools may be made more efficient. Other public services may be improved.

If the goal is to maximize the social product over time and the programs designed to attain this goal are to improve the conditions under which people work and live, then these recommendations are fully justified. Education, cooperation and equitable compensation are the essential ingredients of any resource development and use program. Success in carrying it out will always depend upon the vision, leadership and initiative of the people.