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The Effect of a Large Reservoir on Local Government Revenue and Expenditure

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THE EFFECT OF A LARGE RESERVOIR
ON LOCAL GOVERNMENT REVENUE
AND EXPENDITURE

Clyde T. Bates

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University of Kentucky Water Resources Institute
Lexington, Kentucky

One of a series of technical reports
on

Project Number A-006-KY

Dr. L. Douglas James, Principal Investigator
Dr. Don M. Soule, Dissertation Director

1969

INTRODUCTION

"The Effects of a Large Reservoir on Local Government Revenue and Expenditure" is based on research performed as part of a project entitled "The Economic Impact of Flood Control Reservoirs" (OWRR Project No. A-006-KY) sponsored by the University of Kentucky Water Resources Institute and supported in part by funds provided by the United States Department of the Interior as authorized under the Water Resources Research Act of 1964, Public Law 88-379. The U.S. Army Corps of Engineers (including operating personnel at the Barren, Barkley, and Green Reservoir sites as well as the Louisville, Kentucky, and Nashville, Tennessee District offices), the Kentucky Departments of Education and Revenue, and the county tax commissioners and judges in Adair, Allen, Barren, Lyon, Taylor, and Trigg Counties, Kentucky, provided much of the necessary data as well as helpful qualitative information.

The overall project is examining the economic consequences which resulted from the construction of four existing reservoirs in the hope that the results might suggest improved techniques for the economic evaluation of proposed projects. This is the ninth of a series of reports developed from the project and deals with the impact of reservoir construction on the finances of county governments and school districts in the rural areas in which reservoirs are typically constructed. The investigation was based on case studies of three large Kentucky Reservoirs. The analysis resulted in the conclusion that the ability of these units of local government to collect taxes is not significantly impaired because of the length of time required for project completion and the small portion of the total county area usually taken. The primary expense added to local governments accrued to school districts experiencing a large influx of construction workers with their families.

Readers comment on the research problem, the approach described in this report, or the findings as presented are encouraged and should be directed to L. Douglas James, Project Director.

ABSTRACT

Development of a large multi-purpose reservoir within the area of their jurisdiction may affect property tax revenue and expenditure of county governments and school districts. Privately owned land sold to a federally sponsored reservoir is not subject to property taxes because of the doctrine of intergovernmental immunity. Local officials often assume that this loss of assessment will reduce their tax revenue and thereby their fiscal ability to provide an acceptable level of government services. They may also expect the influx of construction workers or the disruption of existing facilities to increase the cost of providing these services. The study approaches the problem by proposing and then trying to substantiate through case studies the hypotheses that a gradual loss of acreage from the tax assessment rolls does not increase the severity of local property taxes; and local government expenditures are not increased by reservoir development.

The case study used three reservoirs (each one affecting two counties and two school districts) constructed during the period from 1957 to 1968. The reservoirs--Barkley, Barren, and Green--were the largest constructed in Kentucky during this period. The reservoirs were selected from this period to avoid the difficulties inherent in collecting older data and to reflect current institutional practices in reservoir development.

This study uses time trends in tax severity to determine the tax revenue effect on local governments. The severity of local property taxes is indexed by the ratio of property taxes to (1) the full-market value of the tax base and (2) the personal income of the taxpayers in the affected jurisdictions. Time changes in these two ratios yield elasticity coefficients that are interpreted in terms of increasing, decreasing, or unchanging tax severity. Coefficients are computed for each affected government for each year as well as over the entire period of reservoir development. The elasticity coefficients for the

local governments and school districts are compared with those for the average of all counties and school districts in the state over the period of time encompassing reservoir development.

The two indices of tax severity show that the burden of the property tax did not increase as land was gradually removed from the local tax rolls. In comparison with the averages for all counties and all school districts, the tax severity trend in the affected jurisdictions was much less severe.

No county governments and the school districts in only one county experienced any expenditure increases causally related to reservoir development. The failure of project construction to increase expenditure is attributed to the preference of construction workers to commute from urban areas rather than live locally.

The diminished severity of property taxes in the studied areas is attributed to an accelerated rate of economic growth during land acquisition and construction, the ability of the local governments to make the necessary adjustments over the time required for land acquisition, and the receipt of federal subsidies by some of the affected school districts.

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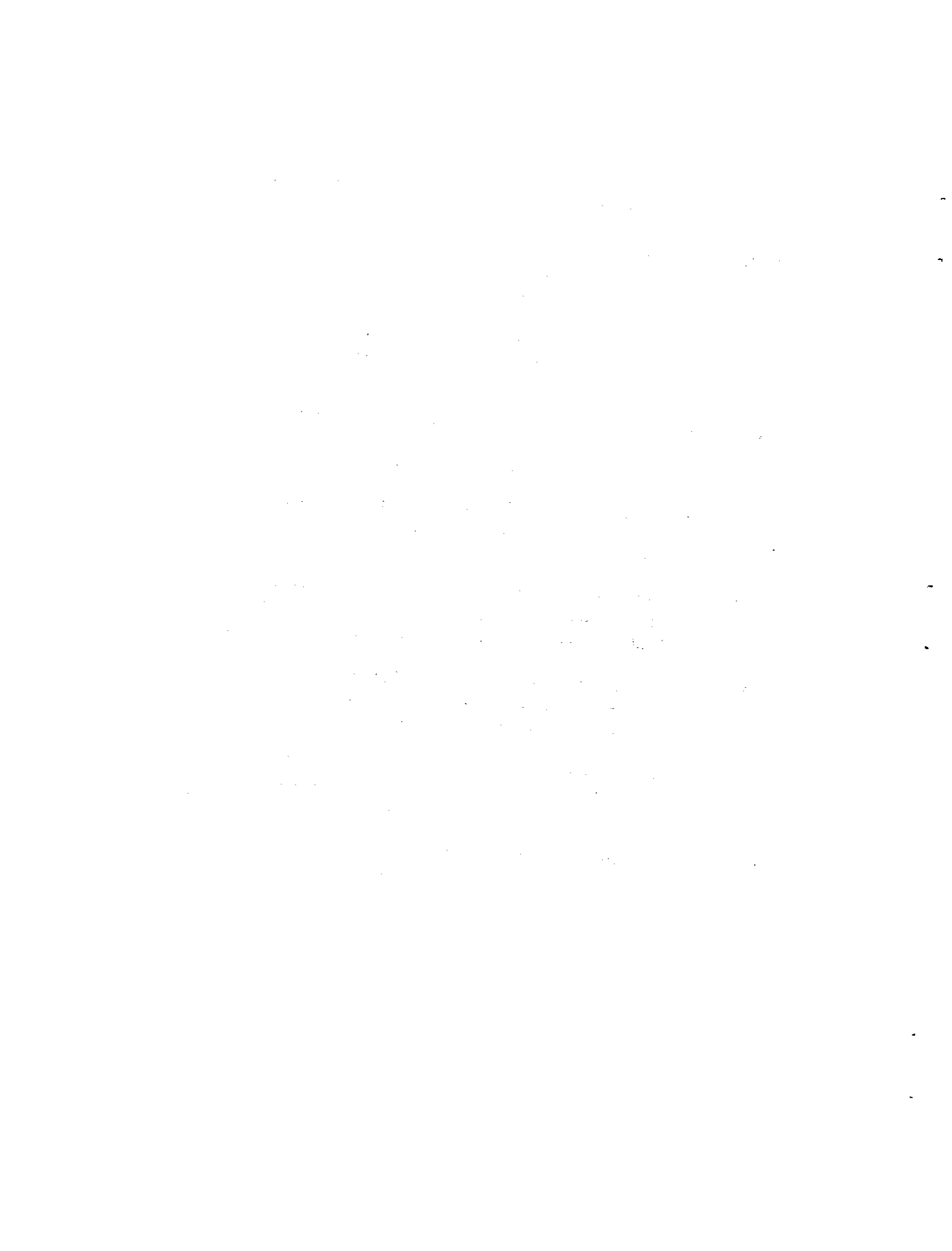
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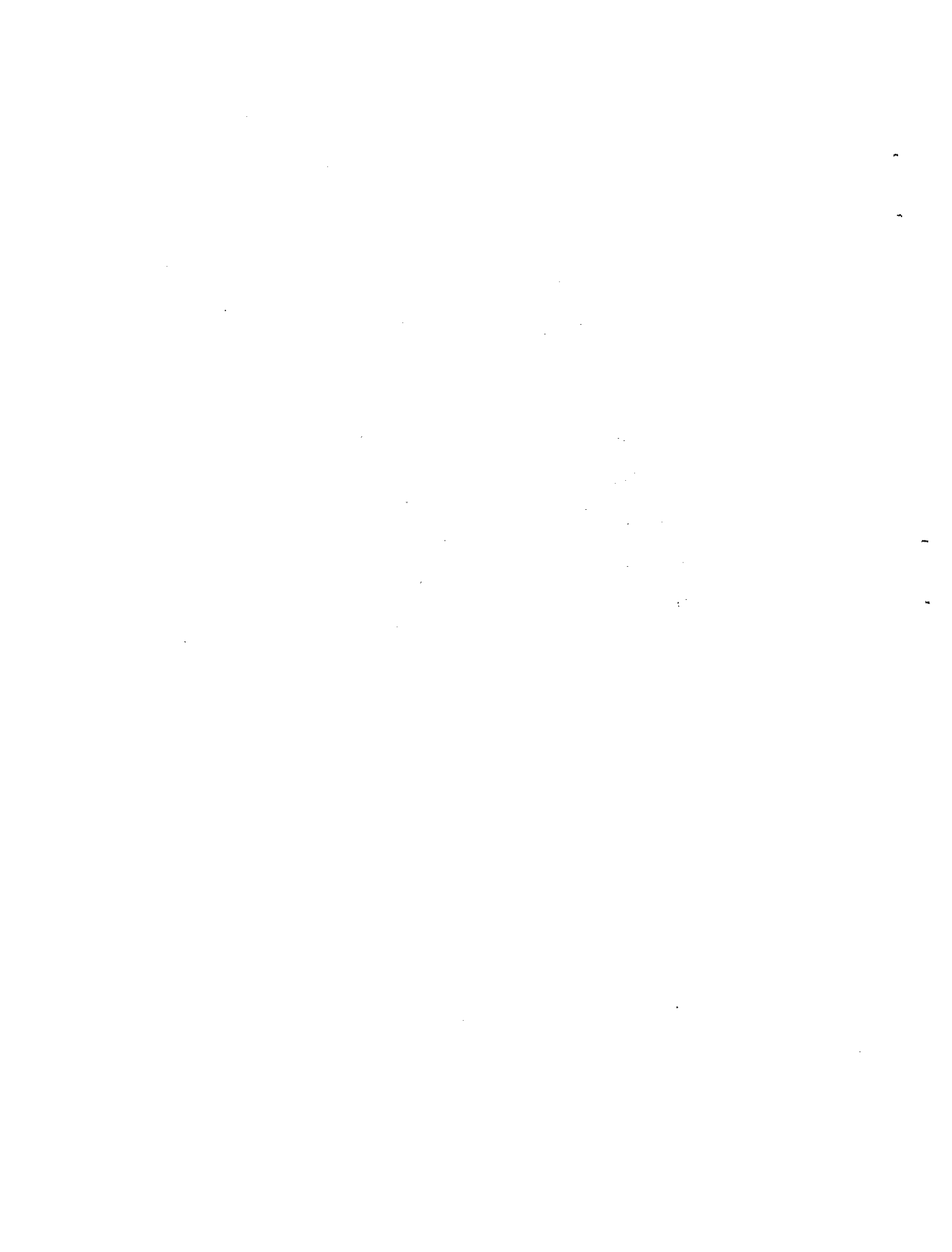
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CHAPTER I

INTRODUCTION

Not all proposed federally sponsored projects are favorably received by a rural community. One type often viewed with apprehension is a multi-purpose reservoir. This adverse feeling stems primarily from the fact that reservoirs absorb large amounts of land--land that is not only lost to public or private use but also lost from the tax rolls of local government. Federally owned land is exempt from local property taxes under the doctrine of intergovernmental immunity. Many local government and school officials hold the a priori assumption that their financial position will be impaired by the loss of real property from the tax rolls. Some jurisdictions may find their expenditures increased by the demand for services by project workers, the resettlement of displaced families, or the reordering of activities required to adjust to blocked transportation routes. This study is an investigation into the circumstances in which the construction of a large multi-purpose reservoir has a significant effect on the property tax revenue and expenditures of county governments and school districts. The experience data is based on case studies involving Kentucky reservoirs.

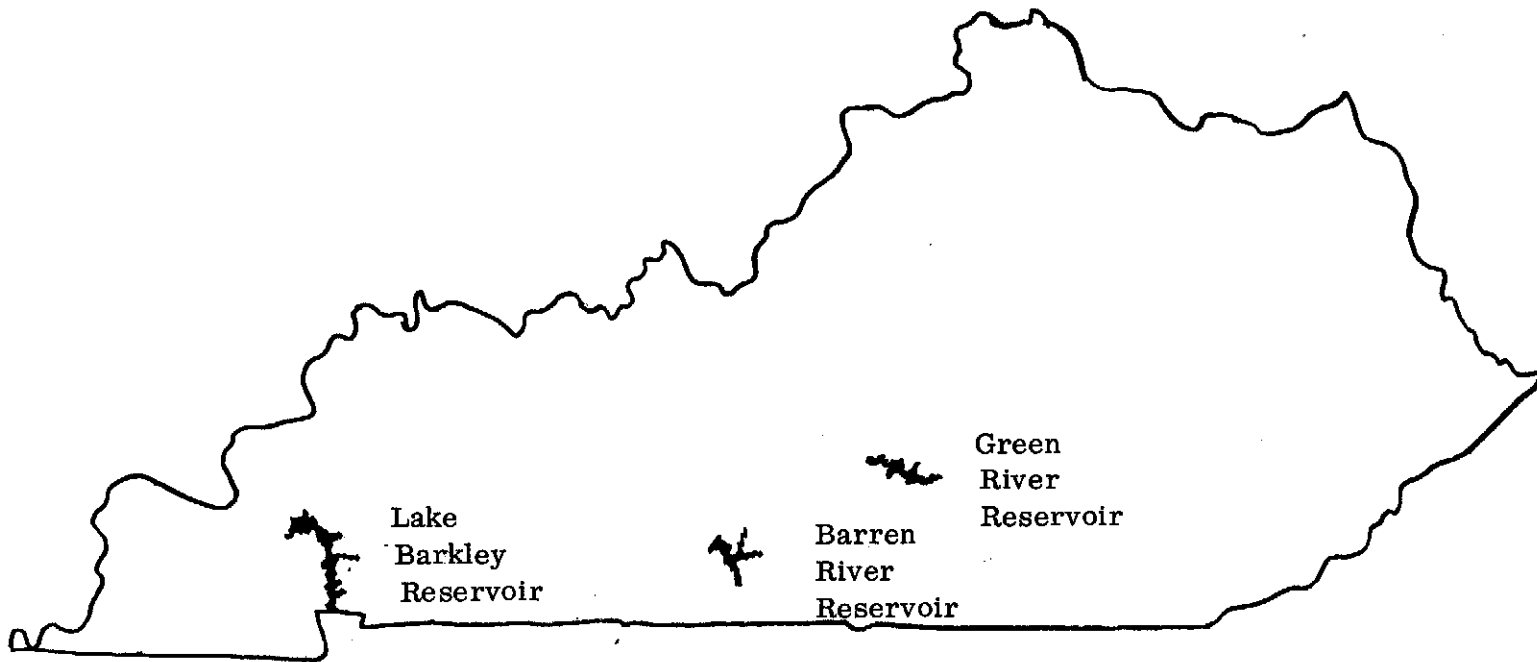
Local governments located in areas experiencing water resource development suffer a loss of acreage from the tax rolls as the federal government acquires the land necessary for the reservoir. However, land acquisition occurs on a piecemeal basis beginning at the dam site. Usually a period of three to six years is needed to acquire all the needed acreage. The rate of acquisition depends on the willingness of people to sell land, the amount of funds made available by Congress, and the time

when particular parcels are needed as determined by construction scheduling. In the long-run, reservoir benefits--flood control, water conservation, recreation, electric power, and low flow augmentation for water quality control--increase the economic value of property contiguous to and downstream from the reservoir providing the potential for additional property tax revenue for county and school governments. The length of time required for the increase in value of the remaining property to compensate for the value of the property removed from the tax rolls depends on the severity of the initial loss (26, pp. 89-96). It is in the short-run, or land buying and dam construction phase, however, that local officials generally assume that an adverse fiscal effect will be created at the local government level.

SCOPE

Between 1955 and 1968, ten reservoirs were constructed or in the process of construction in Kentucky. Only the three largest were selected for this study because the smaller projects have a smaller and hence harder to measure economic effect. The period 1955 to 1968 was selected because of the difficulty of getting reliable data at the local level for earlier years. This study is limited to reservoirs located in Kentucky because of the homogeneity of customs, laws, record-keeping, and government budgets.

The three reservoirs selected for study--Barkley, Barren, and Green River--are shown on Figure 1. Barkley Dam is located in Lyon and Trigg Counties in Western Kentucky. (Barkley Dam inundates part of Stewart county, Tennessee, but this study is limited to Kentucky.) The Barren River Reservoir is located in Allen and Barren Counties in Southern Kentucky. The Green River Reservoir is located in Adair and Taylor Counties in South Central Kentucky.



Lake
Barkley
Reservoir

Barren
River
Reservoir

Green
River
Reservoir

Figure 1: Reservoir Location

County governments are used in this study because they collect tax revenue from and provide most governmental services to the rural areas where reservoirs are located. Local urban governments are much less likely to be affected because right-of-way costs in congested areas are usually too great for a project to be justified.

Barkley Reservoir is, by far, the largest of the three reservoirs in terms of expenditures, construction time, and acres of land purchased. Work on the Barkely Dam began in 1957 and was completed in 1966 at a total cost of \$142,000,000. The second largest reservoir is the Green River constructed during the period from 1964 to 1968 at a total cost of \$30,400,000. The smallest of the three reservoirs is the Barren River, constructed during the period from 1960 to 1964 at a cost of \$24,780,000 (22).

It is within the scope of this study (a) to determine the effect on the property tax base, the property tax revenue, and the severity of the property tax at the local level caused by real property being purchased and removed from the tax rolls, (b) to determine, where possible, the effect on local government expenditures incident to construction of the three selected reservoirs, and (c) to assess the significance and implications of the resulting information in predicting the financial impact of reservoir construction on local government.

SOURCES AND CHARACTERISTICS OF DATA

This study utilizes only primary sources of data. The primary sources of data are: the Kentucky Department of Education; the Kentucky Department of Revenue; the Auditor of Public Accounts; Budgets located in county clerks' offices in Lyon, Trigg, Adair, Taylor, Allen and Barren Counties, Kentucky; interviews with local government and school officials

in these Counties; and the 1954, 1959, and 1964 Censuses of Agriculture. Data on acreage purchased and land costs are obtained from the Louisville and Nashville District Offices of the U. S. Army Corps of Engineers. Some general information is obtained from local business and government officials.

Data relating to county property values, assessed values, and rates of taxation are obtained from the Kentucky Department of Revenue and from the Auditor of Public Accounts. Estimates of equalized property values for school districts are obtained from Status Reports and records of the Kentucky Department of Education.

Assessed values of different categories of property are obtained from the Annual Reports submitted by the county tax commissioners to the Kentucky Department of Revenue. The category most relevant for this study is the farms and acreage classification.

Assessed values for common and independent school districts are obtained from the Status Report, Kentucky Public Schools, 1959 to 1967. Data for other years are obtained from the files of the Division of Finance, of the Kentucky Department of Education.

Data on the amounts and proportions of total school revenue supplied by federal, state, and local governments are obtained from Public School Revenue Receipts, Kentucky Department of Education.

Data pertaining to county population, personal income and buying power are obtained from Survey of Buying Power, Sales Management, Inc. Data obtained from Survey of Buying Power are annual estimates compiled from various sources by Sales Management, Inc. Permission was obtained from the Company to use their data with the proviso that further reproduction is forbidden.

Data relating to total county acreage, per acre value of land, number of farms in the counties, and acreage in farms are obtained from the 1954, 1959, and 1964 U. S. Censuses of Agriculture.

PLAN AND ORGANIZATION

This study is divided into five remaining chapters. Chapter II describes the methodology and justification for using the case study approach. Chapters III, IV, and V are case studies of the local fiscal effects resulting from the development of the Barren, Green and Barkley reservoirs. Chapter VI, the final chapter, presents a summary of the results obtained from the case studies of reservoir development, conclusions, and suggestions for further research. An appendix containing relevant data used in the study follows Chapter VI.

CHAPTER II

METHOD AND PROCEDURES

The objective of this study is to ascertain the effect on property tax revenue and expenditures of county governments and school districts during the period of right-of-way acquisition and construction of a large multi-purpose reservoir within their jurisdiction.

HYPOTHESES

The investigation of effects on property tax revenue proceeds on the following hypothesis based on the review of literature and discussion with local government officials; a gradual loss of rural acreage from the tax assessment rolls available to county governments and school districts to a large multi-purpose reservoir does not increase the severity of the property tax vis-a-vis the capacity of the taxpayers to pay the tax. While there would logically be an upper limit to the rate at which the acreage loss could be absorbed without increasing tax severity, this limit is hypothesized to have not been approached by reservoir construction in Kentucky.

Concomitant with acreage loss, it is further hypothesized that reservoir construction does not cause any significant increment to the expenditures of rural county governments and school districts. While there would again logically be an upper limit to the ratio of construction workers living locally to the total county population for which this can be true, this limit too is hypothesized to have not been approached by reservoir construction in Kentucky.

REVENUE AND EXPENDITURES OF COUNTY GOVERNMENTS
AND SCHOOL DISTRICTS

The property tax is the most important source of tax revenue for local units of government in Kentucky, especially county governments and school districts, because property taxes have traditionally been the local tax source, and other taxes have been preempted by higher levels of government. However, as state and federal funds have been made available to finance various local programs, the relative importance of the local property tax to the total budget has declined, especially in school districts.

In Kentucky, the property tax is levied on both real and personal property. Real property consists of land and improvements; personal property consists of tangibles (goods) and intangibles (claims to goods). The property tax is unique in the way in which the tax levy is established. Prior to January 1, 1966, the tax levy in Kentucky could be determined by adjusting the gross assessment of property, adjusting the nominal tax rate, or some combination of the two. The usual practice was to use the maximum nominal rate allowed by law and adjust the gross assessment of property to provide the necessary tax revenue. Beginning January 1, 1966, under a ruling by the Kentucky Court of Appeals, all property had to be assessed at its full market value.¹ Determination of the tax levy since that

¹ Additional tax revenue, if needed for additional expenditure, could formerly be obtained by raising tax rates or assessment ratios. With fractional and variable assessment ratios, more revenue can be obtained merely by the assessor "seeing more value" and raising the assessment accordingly. Many counties had reached the maximum allowable tax rate and therefore provided desired tax revenue by increasing the assessment ratios. This could be done on a selective basis so as not to affect all property owners. Since the mandatory 100 percent assessment ruling, however, increased revenue can be obtained only from higher tax rates, which are

date consists of setting the effective tax rate. The permissible variation of the tax rate however, has been subject to a maximum statutory limitation for both county governments and school districts.

County expenditures in Kentucky are divided for accounting purposes into two broad categories: general fund expenditures and road and bridge fund expenditures. General fund expenditures pay for the administration of the functions performed by county government. Road and bridge fund expenditures pay for road and bridge maintenance, materials, road machinery and machinery repairs. The percentage of each of the various categories for the six counties studied for fiscal year 1962-63 are shown in Figure 2.

The county budget is determined by the fiscal court, which in most Kentucky counties, is composed of the county judge and three commissioners. The determination of current county expenditures is, to a certain extent, a function of anticipated revenues. In a rural county where changes in the economic base take place slowly, the amount of revenue for the coming fiscal year can be rather accurately ascertained from the current year's revenue. To raise additional revenue for needed expenditures, the tax rate on property can be raised provided the statutory limitation has not been reached. However, an increase in the tax rate is anathema to many county judges and commissioners; the increasing of tax rates must be weighed against the political consequences (all members of the fiscal court are popularly elected). [Some county officials expressed the view that an increase in property tax was political suicide (31).] However,

allowable only under certain conditions. Furthermore, increased tax rates apply to all property owners and cannot be made on a selective basis. Possibly for this reason, local government officials have been reluctant to raise tax rates.

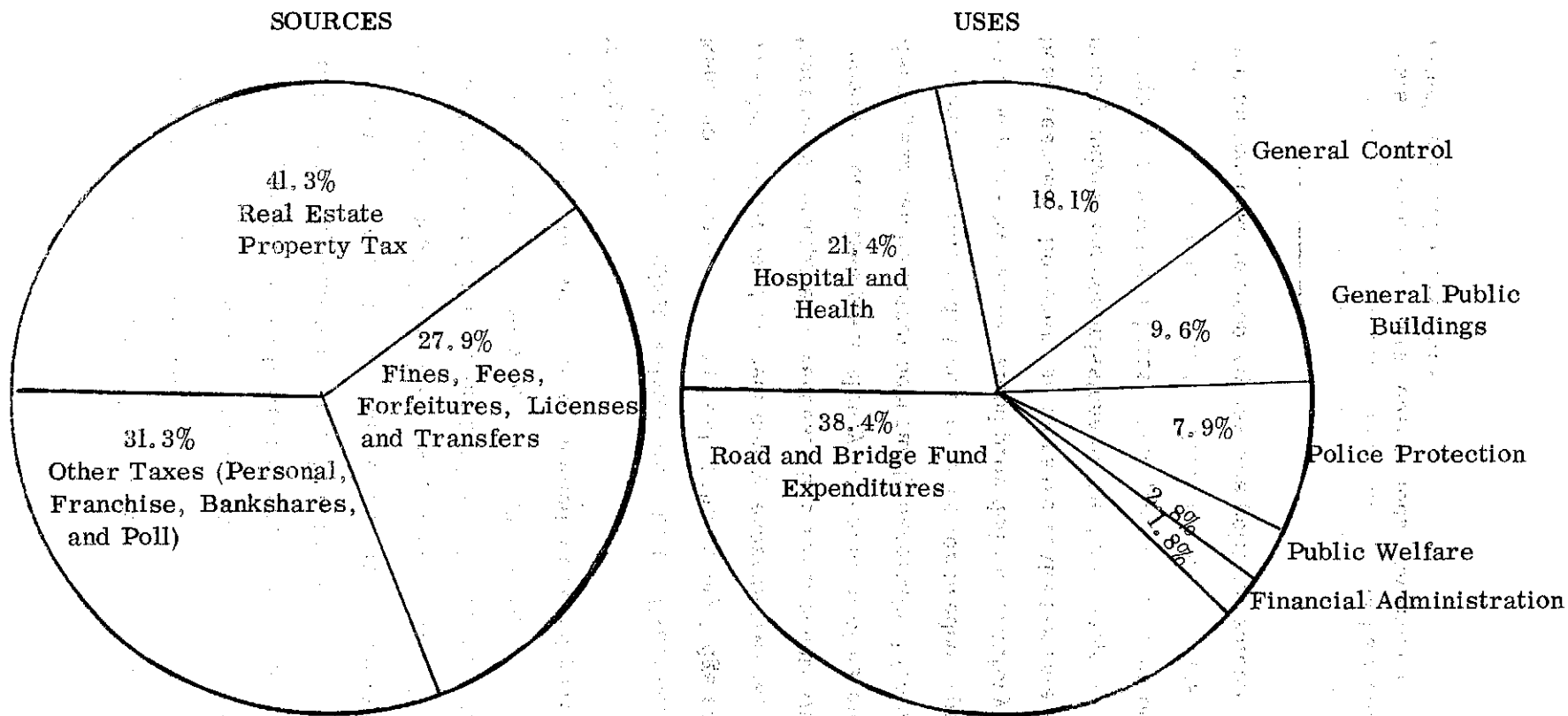


Figure 2. The average of sources and uses of funds in the six studied county governments, Fiscal Year 1962-63.

Sources: Kentucky Department of Revenue and 1962 U.S. Census of Governments

for the state as a whole, county taxes and expenditures have risen very rapidly in the past five years. Expenditures have continued to increase even in those counties that have lost a sizeable proportion of their population. This increase has been largely caused by the demand for higher salaries and wages by local government officials and employees.

The package of services (expenditures) provided by rural counties in Kentucky are fairly homogeneous over the state. Most of the county offices and functions of these offices are specified by the state constitution. Each county has a fixed number of officials regardless of population size. An examination of time trends in the budgets for rural counties reveals that costs are insensitive to population changes and thus implies that excess capacity typically exists in the administration of these offices. County officials are not too busy to handle small increases in demand for their time. Hence, in rural counties, small fluctuations in population do not cause a corresponding movement in county expenditures. Changes in the socio-economic configuration of the population--an increase in the number of aged persons, or an increase in the number of indigent people in the county--would tend to increase some county expenditures, e. g., hospital, food stamp distribution, and welfare. Certain groups of people, because of age, health, or economic status, receive more government services than others. The effect of movement of a group of workers into a county on a temporary basis on county government expenditures is dampened by their negligible use of such services.

The sources and current uses of funds for school year 1962-63, in the six county school districts studied, are shown in Figure 3. Capital expenditures are excluded because of their large fluctuations and variability among districts. For school districts, the most important source of funds is from the state--64.7 percent of the total. Of the total school funds, only 16.9 percent is provided by the general property tax; local sources as a whole provide

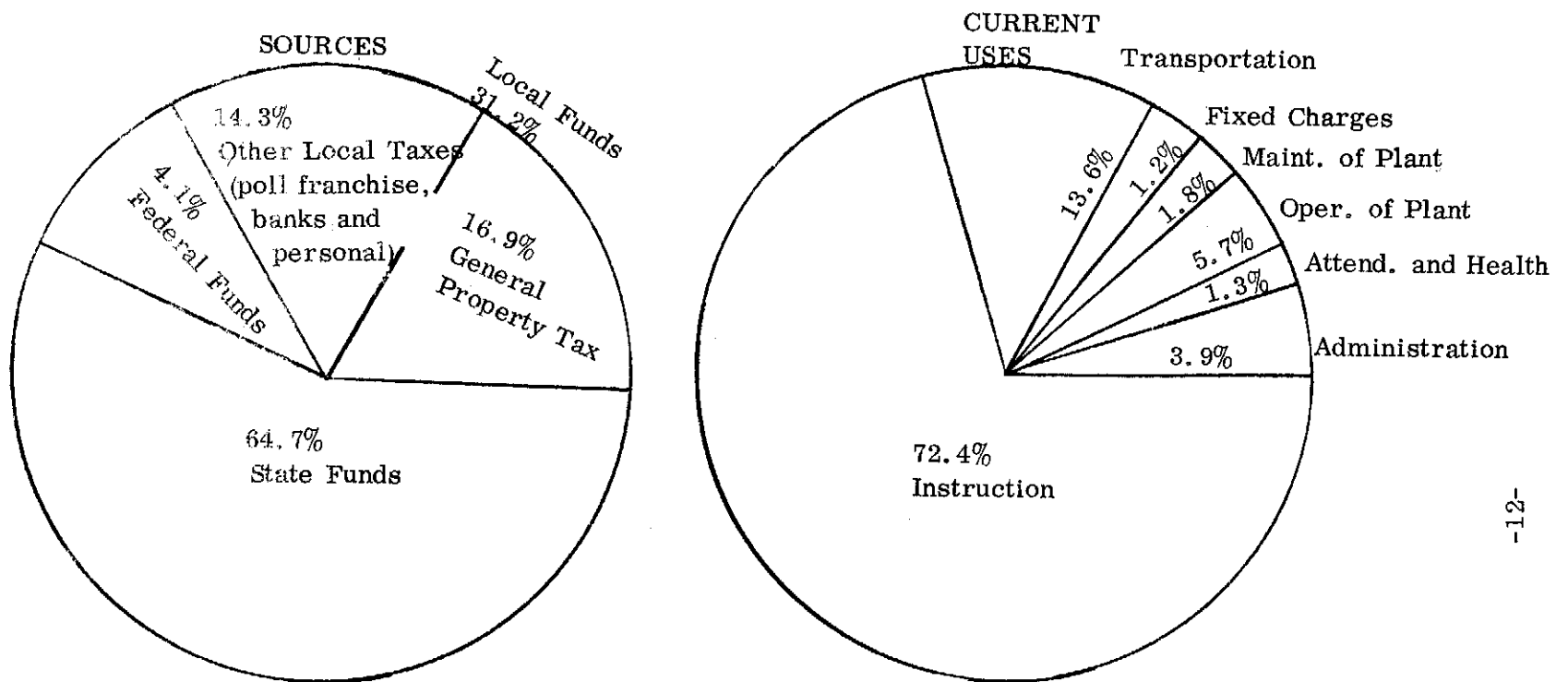


Figure 3. The average of sources and current uses of funds in the six studied county school districts, school year 1962-63.

Source: Biannual Report of the Superintendent of Public Instruction, 1961-62, and 1962-63.

only 31.2 percent, and this amount is declining as federal and state sources increase. The largest use of school funds is for instructional costs-- 72.4 percent of the total.

The budget for a rural school district is made relatively inflexible by numerous restrictions imposed by the state. The budget is made by the school board, usually by the school superintendent in rural areas. The number of students, average daily attendance, and other data which can be ascertained from present and past records, set the amount of revenue available from state and federal sources. Local revenue can be determined by multiplying existing tax rates times the assessed value of property. The amount of tax revenue raised at the local level can be adjusted to meet total revenue requirements subject to a minimum and a maximum restriction. A minimum amount of tax revenue must be raised in order to comply with the Kentucky Minimum Foundation Program, and thus qualify for the full state subsidy. The maximum is determined by the so-called "tax rollback law"-- also known as House Bill 1--passed by the 1965 special legislative session. The rollback law limits the increases in the money collected from local property taxes in the two subsequent years to two ten-percent annual increases. This law is more of a problem in urban than in rural areas because of more rapidly increasing school enrollment in urban school districts. It is not significant in the counties examined in this study.

On the expenditures side of the budget, a number of state and federal regulations govern specific categories of spending. For example, there is a minimum salary schedule for teachers with various degrees and experience. Available revenues are seldom sufficient for a district to substantially exceed this amount. Given a particular school district tax base and enrollment, there is little leeway available to school officials in its budget determination.

The critical factor determining school expenditures in a given school district is the size of enrollment. The Minimum Foundation Program sets an upper limit of 35 students per classroom. An increase of about 30 students will usually require the employment of an additional teacher, according to school officials. Therefore, an increase in instructional costs will occur as people come into a school district.

MEASURES OF PROPERTY TAX SEVERITY

The ability or capacity of a group of people to pay property taxes might be indexed by either of two variables: the dollar amount of taxable property or personal income. The change in severity of the property tax from year to year depends on its rate of increase vis-a-vis the rate of increase in capacity, i. e., taxable property and personal income of the taxpayers. These relationships--annual changes in property taxes to annual changes in property value and personal income--can be expressed in terms of elasticity coefficients. The ratio $\Delta T/T/\Delta Y/Y$ measures the annual change in property taxes (T) to the annual change in personal income (Y). Personal income is the sum of transfer payments, dividends, interest and rent, proprietors' income, and wages and salaries. The ratio $\Delta T/T/\Delta B/B$ measures the annual change in property taxes to the change in tax base (B). The tax base used in this computation is the estimated full market-value of all property subject to assessment by the taxing authority, rather than the gross assessed value, for the years prior to 1966.² Because prior to 1966, the ratio of assessed

²Values before and after 1966 were thus made comparable by using estimated full value of property for years prior to 1966.

to total value could be altered up or down by local governments; the nominal tax base and the full market-value did not always vary proportionally.

The two change ratios--property taxes to personal income, and property taxes to tax base--yield elasticity coefficients which can be used to assess the changing severity of the property tax from year to year or any other time period selected. Various coefficient values denoting increases and decreases in tax severity are shown on Table 1. The elasticity coefficients for these ratios are usually positive as B, T, and Y normally all increase from year to year. In such cases, ratios exceeding unity suggest increasing tax severity while smaller ratios suggest decreasing tax severity with time. Where negative values exist in either the numerator or the denominator, increasing tax severity with time is implied by a numerator exceeding the denominator in algebraic value.

Changes in property tax revenue totals from year to year do not, by themselves reveal any changes which can be causally associated with reservoir development. Decrements in the size of the physical tax base--smaller acreage--from year to year do not necessarily mean that the property tax severity will increase. The significant variables for determining whether an increase is occurring in an absolute sense are disposable income and market value of taxable property and their annual changes relative to the tax levy. The elasticity coefficients may indicate either a decreasing or increasing tax severity. A community experiencing increasing tax severity will be more sensitive to a revenue impact associated with the loss of land (taxable base) from the tax rolls. This indicates a growth in property taxes faster than the growth in tax base which would, ceteris paribus, be partially mitigated by retention on the property tax rolls of the land taken by the reservoir. In order to better judge the impact of reservoir development on property tax revenue, the elasticity coefficients of the affected county governments and school districts are compared with like indices computed for the state during the same time period.

HYPOTHETICAL EXAMPLES OF VARIOUS POSSIBLE ELASTICITY RATIOS
FOR COEFFICIENTS OF TAX SEVERITY

Relatively Greater Severity ^a	$\frac{-2.0}{1.0}$	$\frac{-1.0}{1.0}$	$\frac{-0.5}{1.0}$	$\frac{0}{1.0}$	$\frac{0.5}{1.0}$	$\frac{1.0}{1.0}$	$\frac{2.0}{1.0}$ ^c
→	$\frac{-2.0}{-1.0}$	$\frac{-1.0}{-1.0}$	$\frac{-0.5}{-1.0}$	$\frac{0}{1.0}$	$\frac{0.5}{-1.0}$	$\frac{1.0}{-1.0}$	$\frac{2.0}{-1.0}$
Relatively Less Severity ^b	$\frac{1.0}{-2.0}$	$\frac{1.0}{-1.0}$	$\frac{1.0}{-0.5}$	$\frac{1.0}{0}$	$\frac{1.0}{0.5}$	$\frac{1.0}{1.0}$	$\frac{1.0}{2.0}$
→	$\frac{-1.0}{-2.0}$	$\frac{-1.0}{-1.0}$	$\frac{-1.0}{-0.5}$	$\frac{-1.0}{0}$	$\frac{-1.0}{0.5}$	$\frac{-1.0}{1.0}$	$\frac{-1.0}{2.0}$

^aThe ratios shown in the first two rows denote relatively greater tax severity going from left to right. In the first row, the denominator--the measure of tax capacity either personal income or tax base--remains constant as the property tax, in the numerator, changes from negative decrements to positive increments. In the second row the denominator remains constant and negative as the property tax changes from negative to positive values giving more negative coefficients.

^bThe ratios shown in the second two rows denote relatively less tax severity going from left to right. As the denominator gets largely relative to the numerator tax severity decreases as shown in row three. In row four the numerator is negative throughout, denoting a tax decrease, while the denominator changes from negative to positive values showing a decrease in tax severity.

^cAll circled values indicate tax severity increasing with time.

THE CASE STUDY METHOD

The method of investigation is a case study of the effect three large multi-purpose reservoirs have had on local government tax revenue and expenditure. The three selected reservoirs were constructed during different time periods from 1957 to 1968. The study is concerned with the short-run time period from the date when land acquisition begins, through the period immediately following dam construction, until 1968, which for these reservoirs, is at the most four years after construction is completed. Long-run effects of reservoirs on property tax base and hence tax revenue are described by Vaughn (26).

A case study is made for each of the three selected reservoirs. Construction of these reservoirs occurred in the following time periods: Lake Barkley, 1957-1966; Barren River, 1960-1964; and Green River, 1964-1968. The Green River reservoir was not completed until the end of 1968, and does not have a post-construction period. The other reservoirs have two identifiable phases: the phase of land acquisition and construction which occur almost simultaneously, and the phase following construction, or post construction. The timing of the phases of development for each reservoir is shown in Figure 4.

The case study, as a method of investigation, allows a thorough examination of the physical and economic forces controlling the phenomenon to be studied. A statistical study, no matter how complete, cannot wholly describe and utilize all the available information on a situation studied. It cannot pinpoint the way forces interact to cause specific events. Whereas a statistical study must be limited to quantitative data, the case study method can make use of detailed qualitative and quantitative data. The case study allows diverse sources of data to be brought together to form a composite picture of events and their changes through time.

RESERVOIR

BARKLEY / LAND ACQUISITION AND CONSTRUCTION / POST
CONSTRUCTION

BARREN / LAND ACQUISITION AND/ POST CONSTRUCTION

GREEN / LAND ACQUISITION
AND CONSTRUCTION

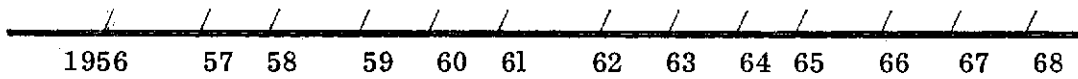


Figure 4. The Phases of Reservoir Development Studied

The case study is particularly suited for evaluating the effects of reservoir construction on local government finance. First, it is necessary to use certain data, available only at the local government level, which is not homogeneous and thus cannot be aggregated. Budgeting and financial reporting at the local level is somewhat variable from one unit of government to another as well as from year to year with administrative changes in a given government. Also, nominal and effective tax rates vary from one unit of government to another. This is evidenced in the change made from 1965 to 1966 when property assessment rates were changed from fractional to full market value. Changes in assessment from year to year do not always clearly delineate significant marginal change. Second, functions performed by comparable units of governments are not always uniform. Third, expenditures made by one taxing unit may not be made by another comparable taxing unit. For example, transportation costs are usually incurred by county school districts, but usually not by independent school districts. Fourth, the large number and diversity of local governments complicates any attempt at statistical comparison with counties and school districts other than those in the studied areas. Fifth, the case study method provides diverse data and information on a particular situation which allows study of the common sense changes in the affected geographical area. Sixth, the universe of like reservoirs equals one.

In the following three chapters, case studies of the three selected reservoirs are made: Chapter III is a case study of the Barren River Reservoir; Chapter IV is a case study of the Green River Reservoir; and Chapter V is a case study of the Barkley Dam.

CHAPTER III

THE BARREN RIVER RESERVOIR

This third chapter is the first of three case studies concerning the effect of reservoir development on local property tax revenue and expenditure. The present chapter is a case study of the impact of the Barren River Reservoir on the property tax revenue and expenditure of counties and school districts in Allen and Barren Counties in South Central Kentucky. In terms of acreage inundated, the Barren River Reservoir is the smallest of the three reservoirs studied. The dam is located on the Barren River, a tributary of the Green River, on the county line between Allen and Barren counties on Highway 252, about ten miles northeast of Scottsville, the county seat of Allen County. The reservoir is located on the map in Figure 5. The Barren River Reservoir project was selected for construction under the general authorization for flood control in the Ohio River Basin under the Flood Control Act of 1938. Construction of the project began in March, 1960, and was essentially completed by September, 1964. The primary purpose of the Barren River Reservoir is flood control, but development is being made for recreation and wildlife conservation.

A BRIEF DESCRIPTION OF ALLEN AND BARREN COUNTIES

Allen County is located in the southern section of Kentucky, contiguous to the Kentucky-Tennessee border. It is bounded by Warren and Barren Counties on the north by Monroe on the east, by Simpson on the west, and the Tennessee border on the south. To the northeast of Allen County is Barren, bounded by Hart County on the north, by Metcalfe and Monroe Counties on the east, and on the west by Edmonson and Warren Counties.

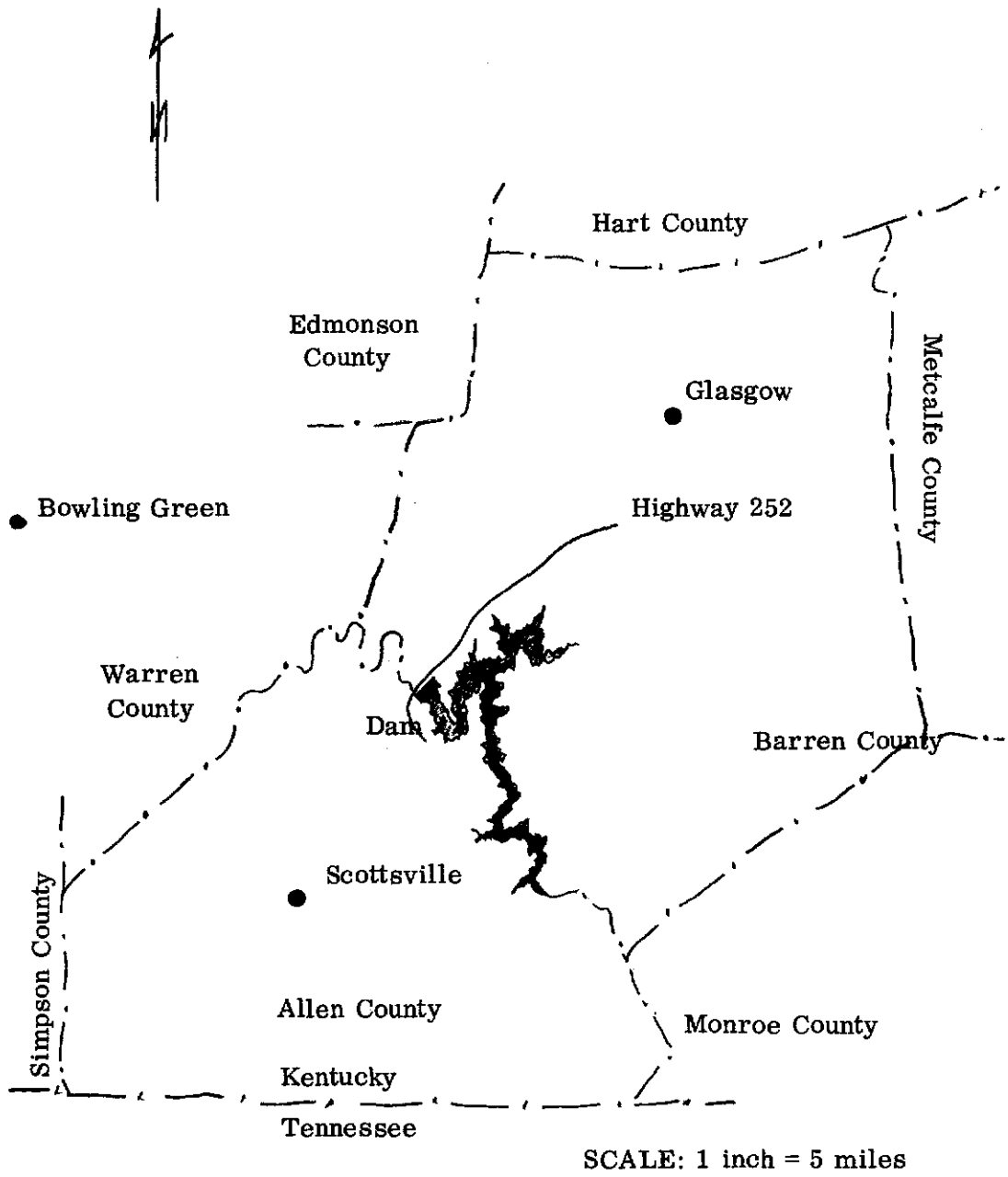


FIGURE 5: The Location of the Barren River Reservoir

The population of Allen County has shown a steady decline since reaching a peak in 1940 (Appendix B). In 1967, the population was estimated at 12,400 (30, June 10, 1968). The continuous decline in population is due largely to the diminishing number of agricultural opportunities in the county with little increase in the number of industrial jobs. The population of Barren County has been almost static for twenty years. The 1967 population was estimated at 29,300 (30, June 10, 1968). The static population is a result of growth in the town of Glasgow, the county seat of Barren County, while the rural population of the county has diminished.

The primary industry of both counties is agriculture. In 1964, 188,630 acres of a total 232,900 was used for agricultural purposes in Allen County (19). In Barren, a much larger county than Allen, there were 293,717 acres of land of a total of 311,040 used for agricultural purposes (19). From 1959 to 1964, the period encompassing reservoir development, the average value per acre of farmland in Allen County increased from \$74.54 to \$115.27, an increase of 54.6 percent (19). During the same period, the per acre value of farmland in Barren County increased by 47.7 percent, from \$145.56 to \$215.06 (19).

The Barren River Reservoir removed 7,528 acres of farmland from the tax rolls in Allen County; this represented approximately 3.0 percent of the total land area and 4.5 percent of the farmland. The federal government paid \$1,628,345 for the land and improvements, an average price of \$217 per acre (28). Land acquisition totaled 12,581 acres in Barren County. This represented 4.0 percent of the total county area and 4.3 percent of the farm acreage. The federal government paid \$2,767,715 for the land and improvements, an average price of \$220 per acre (28).

Selected economic indicators show Barren County ranking slightly above Allen, although both rank below the state average. In 1960, the per capita personal income in Allen County was \$1,011; in Barren County per capita

personal income was \$1,207 (30, June 10, 1961). Both per capita income figures are considerably below the 1960 per capita income of \$1,388 for the state (30, June 10, 1961). In 1965, the year following reservoir completion, per capita income in Allen County was \$1,245; in Barren County per capita income was \$1,517; the state per capita income was \$1,753 (30, June 10, 1961). For the five year period, 1960-65, per capita income increased by 23.1 percent and 30.5 percent in Allen and Barren Counties, respectively. These rates of increase compare favorably to the increase for the state during the same period--26.3 percent. The growth in income in the two counties took place mostly in the years from 1962 to 1965; both counties were adversely affected by the recession in 1960-61.

THE EFFECT OF THE BARREN RIVER RESERVOIR ON ALLEN COUNTY PROPERTY TAXES

It is the purpose of this section to analyze the effect on property taxes and the relative severity of these taxes in Allen County due to removal of land from the property tax rolls for use in developing the Barren River Reservoir. This analysis uses annual changes in real estate taxes vis-a-vis annual changes in (1) personal income and (2) full value of taxable property (real estate and tangible) in the county. These changes are expressed in coefficients of personal income and tax base and are summarized on Table 2. The 1960 to 1961 change was the last change in the tax and income data prior to sizeable federal land purchases which began in 1961. (Although, an exiguous amount of land was purchased in 1960, no sizeable purchases occurred until 1961).

Annual Changes in Tax Severity

In 1960, the full value of all property subject to taxation by the Allen County government was \$27,168,000 (15, 1962). The gross assessment of property subject to taxation was \$8,274,330 (12). The real estate assessment

TABLE 2

INDICES OF TAX CAPACITY AND TAX SEVERITY
FOR ALLEN COUNTY GOVERNMENT, 1960-1966

Year	Full Value Of Property	Personal Income	Real Estate Tax Levy	Elasticity Coefficients	
				Tax Base	Income
1960	\$27,168,000	\$12,879,000	\$38,451.84	$\frac{4.4}{14.4} = 0.31$	$\frac{4.4}{-6.7} = -0.66$
1961	31,080,000	12,019,000	40,158.98	$\frac{3.3}{9.0} = 0.37$	$\frac{3.3}{5.1} = 0.65$
1962	33,868,000	12,637,000	41,504.69	$\frac{6.1}{-3.4} = 1.79$	$\frac{6.1}{4.6} = 1.33$
1963	32,718,000	13,218,000	44,027.32	$\frac{-6.0}{7.5} = -0.80$	$\frac{-6.0}{5.7} = -1.05$
1964	35,163,000	13,967,000	41,404.30	$\frac{5.9}{5.4} = 1.09$	$\frac{5.9}{11.4} = 0.52$
1965	37,068,000	15,567,000	43,834.53	$\frac{37.7}{6.4} = 5.89$	$\frac{37.7}{14.1} = 2.67$
1966	39,457,339	17,760,000	60,373.72		
1961-1964				$\frac{57.0}{45.2} = 1.26$	$\frac{57.0}{37.9} = 1.50$
1960-1966				$\frac{3.1}{13.1} = 0.24$	$\frac{3.1}{16.2} = 0.19$

SOURCES: Auditor of Public Accounts, Kentucky Department of
Education, and Sales Management, Inc.

in 1960 was \$6,408,640; of this amount, farms and acreage were assessed at \$3,947,222, more than 60 percent of the real estate assessment (16,1961). In 1960, the tax rate was .60 per \$100 of assessed valuation. In 1961 the full value of property increased to \$31,080,000, and increase of 14.4 percent over 1960 (15,1962). The assessed value of property increased by 8.3 percent, to \$8,963,256, from the previous year. Farms and acreage assessment increased to \$3,989,192, up 10.7 percent over the previous year (16,1962).

The tax levy on real estate was \$38,451.84 in 1960 and increased to \$40,158.98 in 1961, an increase of 4.4 percent (12). The base elasticity coefficient, which measures the percentage change in the tax levy to the percentage change in the full value of property subject to taxation, is 0.31. With respect to the change in the value of the tax base, the change in the tax levy is small, giving an inelastic coefficient for the 1960 to 1961 change. Vis-a-vis the tax base, the severity of the property tax diminished from 1960 to 1961.

The total personal income in Allen County was \$12,879,000 in 1960 (30, June 10, 1961). In 1961, due in part to an economic recession, personal income diminished to \$12,019,000, a decrease of 6.7 percent. The income elasticity of the property tax yields coefficient of -0.66, indicating a perverse relationship between property taxes and personal income. (A negative change in only the denominator of the elasticity ratios yields a negative coefficient denoting an increase in tax severity as do coefficients greater than one.)

About 3,010 acres were purchased by the Corps of Engineers in Allen County during 1961. The loss, approximately 40.0 percent of the total land purchased in Allen County, showed up in the assessment values for 1962. The increase in the full value of property was 9.0 percent, from \$31,080,000 to \$33,868,000, down considerably from the 14.4 percent increase in 1961 (15, 1964). The assessment of farms and acreage increased by only 1.9 percent, from \$3,989,192 to \$4,064,965. However, the real estate tax levy increased by

a larger amount from \$40,158.93 to \$41,504.69, an increase of 3.3 percent (12). The base elasticity coefficient for the 1961-62 change is 0.37, inelastic. Relative to the tax base, the severity of the property tax did not increase.

Total personal income in Allen County increased from \$12,019,000 in 1961 to \$12,637,000 in 1962, an increase of 5.1 percent (30, June 10, 1963). The income elasticity coefficient for the change in the property tax from 1961 to 1962 is 0.65--inelastic. Both measures, base and personal income, show a decrease in tax severity from 1961 to 1962. Relative to personal income, in fact, the severity shows a large decrease from the previous year.

In 1962, approximately 1,505 acres, 20.0 percent of the total land acquisition, were purchased and removed from the tax rolls.

Full value of property decreased slightly from \$33,868,000 in 1962 to \$32,718,000 in 1963, a decrease of 3.4 percent (15, 1964). The real estate tax levy increased by 6.1 percent, from \$41,504.69 to \$44,027.32 (12). The tax base elasticity for the 1962-63 change is -1.79--perversely elastic. Taxes increased while the full value of the tax base diminished, denoting an increase in severity.

From 1962 to 1963, personal income in Allen County increased from \$12,637,000 to \$13,218,000 an increase of 4.6 percent (30, June 10, 1964). The income elasticity coefficient for the change is 1.33. The change from inelastic to elastic from the previous yearly change indicates an increase in tax severity.

In 1963, essentially all of the remainder of the acreage purchased for the reservoir was acquired, approximately 3,000 acres. The change in full value of property, however, increased from 1963 to 1964. The amount of the real estate tax levy in 1964 went down from 1963--from \$44,027.32 to \$41,404.40--a decrease of 6.0 percent (12). This decrease in the tax levy was due to a decrease in the tax rate from .60 per \$100 of assessed valuation to .54 per \$100 of assessed valuation. This is one of the few

times prior to 1966 that an adjustment was made in the nominal tax rate. Since income and tax base both increased while property taxes on real estate decreased, the elasticity coefficients for personal income and tax base denote a large decrease in tax severity.

From 1964 to 1965, real estate taxes increased from \$41,404.40 to \$43,834.53, an increase of 5.9 percent (12). The full value of property increased from \$35,163,000 in 1964 to \$37,068,000 in 1965 an increase of 5.4 percent (15). The tax base elasticity measure for the 1964 to 1965 change yields an elasticity coefficient of 1.09--slightly elastic.

Personal income for 1965 was \$15,567,000, an increase of 11.4 percent over the 1964 level (30, June 10, 1966). The income elasticity coefficient for the 1964-65 change is 0.52--inelastic.

The Barren River Reservoir was completed in 1964. The change in the variables from 1965 to 1966 is the first change following completion of the reservoir. In 1966, the full value of property subject to taxation in Allen County was \$39,860,151, an increase of 6.4 percent over the previous year. The tax levy increased from \$43,834.53 to \$60,373.72, an increase of 37.7 percent (12). This large increase was accomplished by a large increase in the assessment of property--the change from fractional to full value assessment occurred in 1966--and a proportionately smaller decrease in the tax rate.¹ The tax base elasticity coefficient for the 1965-66 change is 5.89, very elastic.

¹In 1966, all property was assessed at full value for the first time. The assessment in Allen County was increased by approximately 500 percent and the tax rate decreased by about 70 percent.

From 1965 to 1966, personal income increased from \$15,567,000 to \$17,760,000, an increase of 14.1 percent (30, June 10, 1967). The income elasticity for the change is 2.67, also, very elastic.

Period Changes in Tax Severity

The year to year changes in the coefficients of base elasticity and income elasticity for Allen County do not show a consistent pattern of behavior because the effects caused by the reservoir are superimposed on larger effects caused by other events, such as the recession of 1961, the reduction in tax rate of 1964, and the conversion to full assessment in 1966. From 1960 to 1966, the full value of property in the county increased by 45.2 percent. In the same period, personal income increased by 37.9 percent. Both increases are smaller than the increase in the real estate tax levy--57.0 percent. The tax base elasticity coefficient for the entire period is 1.26--slightly elastic. The income elasticity measure for the property tax is 1.50--slightly more elastic. These coefficients suggest a small increase in the severity of the property tax over the entire period of reservoir development, 1960 to 1966.

The tax base and personal income elasticity coefficients are computed for the period of land acquisition, 1961-1964, to show tax severity changes more closely associated with loss of acreage from the county tax rolls. The large increase in taxes which occurred in 1965 and 1966 are unrelated to loss of tax assessment. The elasticity coefficients for the 1961-1964 period are 0.24 for tax base and 0.19 for income. Both coefficients are inelastic and much smaller than those for the 1960-1966 period, evincing a large increase in tax capacity relative to the increase in property taxes during the period of land acquisition in Allen County.

Discussions with local government and civic officials revealed that none of the local governments in Allen and Barren Counties experienced any changes in expenditures that could be related to development of the Barren River Reservoir (31). The relatively poor access to the dam site and reservoir from the county seat towns of Glasgow and Scottsville resulted in most of the workers, during their period of temporary employment, locating in Bowling Green, a much larger town affording more living quarters and other facilities. The effect of the Barren River Reservoir on local government expenditures in Allen and Barren Counties was thus negligible.

THE EFFECT OF THE BARREN RIVER RESERVOIR ON BARREN COUNTY PROPERTY TAXES

The analysis used in this section is the same as the analysis used in the preceding section for Allen County. The change in the data from 1960 to 1961 serves as the beginning for the study of data change through the entire period of reservoir development.

Annual Changes in Tax Severity

In 1960, the full value of property subject to taxation in Barren County was \$85,257,000; the following year, 1961, the full value of property increased to \$91,338,000, an increase of 7.1 percent (15, 1962). The gross real estate assessment increased from \$19,282,367 to \$19,819,728, an increase of 3.3 percent for the 1960 to 1961 change (16, 1962). The gross assessment of farms and acreage increased from \$10,659,430 to \$10,755,090, an increase of 0.9 percent (16, 1962).

The real estate tax levy increased from \$96,414.17 to \$99,098.74, an increase of 2.8 percent (12). The change in real estate property taxes vis-a-vis change in full value of property --tax base elasticity--gives an elasticity coefficient of 0.39--inelastic. The 1960 to 1961 change indicates a decrease in

the severity of the property tax relative to the tax base. The elasticity coefficients are summarized on Table 3.

Total personal income, influenced somewhat by the recession of 1960-61, increased only slightly from 1960 to 1961, from \$34,047,000 to \$34,162,000, an increase of only 0.3 percent (30, June 10, 1962). The computation of income elasticity for the change in the property tax relative to the change in personal income yields an elasticity coefficient of 9.33--very elastic; but the coefficient is distorted largely by the recession which adversely affected income in 1960 and 1961.

In 1961, approximately 40.0 percent of the total amount of land acquired for the reservoir in Barren County was purchased by the Corps of Engineers and removed from the 1962 tax rolls. This represented about 5,130 acres of 12,581 total acres acquired. The full value of property in Barren County decreased by 0.12 percent from 1961 to 1962--from \$91,338,000 to \$91,225,000 (15, 1964). The gross assessment of farms and acreage decreased from \$10,755,090 in 1961 to \$10,665,965 in 1962, a decrease of 0.83 percent (16). The real estate tax levy increased in 1962 by 3.1 percent from the previous year--\$99,098.72 to \$102,196.11 (12). The change in the real estate tax vis-a-vis the change in full value of the tax base yields a negative coefficient-- -25.83, denoting a perverse change in the tax base, downward, while the tax levy went up. (Small negative changes in the denominator give large negative coefficients when sizeable positive changes occur in the numerator.)

In 1962, income increased considerably as the economy moved strongly out of the recession. In 1962, income was up in Barren County by 6.6 percent over the previous year, increasing from \$34,162,000 to \$36,426,000 (30, June 10, 1963). The income elasticity coefficient yields an inelastic value of 0.47, evincing a sizeable decrease in tax severity relative to the change in income for the 1961-62 change.

TABLE 3

INDICES OF TAX CAPACITY AND TAX SEVERITY
FOR BARREN COUNTY GOVERNMENT, 1960-1966

Year	Full Value Of Property	Personal Income	Real Estate Tax Levy	Elasticity Coefficients	
				Tax Base	Income
1960	\$85,257,000	\$34,047,000	\$96,414.17	$\frac{2.8}{7.1} = 0.39$	$\frac{2.8}{0.3} = 9.33$
1961	91,338,000	34,162,000	99,098.74	$\frac{3.1}{-0.12} = -25.83$	$\frac{3.1}{6.6} = 0.47$
1962	91,225,000	36,426,000	102,196.11	$\frac{2.4}{2.7} = 0.89$	$\frac{2.4}{6.6} = 0.36$
1963	93,682,000	38,818,000	104,677.96	$\frac{5.2}{9.9} = 0.52$	$\frac{5.2}{6.3} = 0.82$
1964	102,954,000	41,275,000	110,147.39	$\frac{4.0}{9.6} = 0.42$	$\frac{4.0}{7.6} = 0.53$
1965	112,844,000	44,437,000	114,587.88	$\frac{23.6}{-0.8} = -29.50$	$\frac{23.6}{13.1} = 1.80$
1966	111,894,137	50,280,000	141,663.65		
1961-1964				$\frac{11.1}{12.7} = 0.87$	$\frac{11.1}{20.8} = 0.53$
				WASHINGTON WATER RESEARCH CENTER LIBRARY	
1960-1966				$\frac{46.9}{31.2} = 1.50$	$\frac{46.9}{47.7} = 0.98$

SOURCES: Auditor of Public Accounts, Kentucky Department of
Education, and Sales Management, Inc.

In 1962, additional acreage was removed from the tax rolls, approximately 20.0 percent of the total, about 2,516 acres of the total amount acquired. However, full value of property increased by 2.7 percent-- from \$91,225,000 to \$93,682,000, from 1962 to 1963 (16, 1964). The real estate tax levy increased from \$102,196.11 in 1962 to \$104,677.96 in 1963, an increase of 2.4 percent (12). The tax base elasticity coefficient for this change is 0.89--slightly inelastic. This coefficient shows a small decrease in the severity of the tax after the large increase in the previous year.

Personal income increased from \$36,426,000 to \$38,818,000, an increase of 6.6 percent from 1962 to 1963 (30, June 10, 1964). The ratio of the change in the real estate tax levy to the change in personal income yields a coefficient of elasticity of 0.36, indicating a marked decrease in severity of the real estate property tax from 1962 to 1963.

Land acquisition was essentially completed in 1963, with the removal of approximately 5,130 acres from the tax rolls. Notwithstanding the loss of a substantial number of acres, the severity of the property tax did not increase in 1964. The full value of property increased from \$93,682,000 to \$102,954,000, a 9.9 percent increase, from 1963 to 1964 (15, 1964). (The gross assessment for farms and acreage increased from \$10,632,395 to \$10,883,565, an increase of 2.4 percent.) The tax base elasticity coefficient for the 1963 to 1964 change is 0.52--inelastic; more inelastic, in fact, than in the previous year.

Personal income increased from \$38,818,000 to \$41,275,000, an increase of 6.3 percent from 1963 to 1964 (30, June 10, 1965). The income elasticity measure is 0.82, inelastic, for the annual change. In the last year of land purchases the severity of the property tax decreased for the Barren County taxpayers as measured by both full value of property and personal income.

From 1964 to 1965, the property tax on real estate increased from \$110,147.39 to \$114,587.88, an increase of 4.0 percent (12). The increase in the tax levy was smaller than the increase in full value of property and personal income. The full value of property increased from \$102,954,000 to \$112,844,000, an increase of 9.6 percent (15, 1966).

Personal income increased from \$41,275,000 in 1964 to \$44,437,000 in 1965, an increase of 7.6 percent (30, June 10, 1966). The tax base elasticity coefficient for the 1964-65 change is 0.42, and the personal income coefficient is 0.53; both measures are inelastic denoting a further decrease in the severity of the property tax vis-a-vis the measures of tax capacity.

The change in the data from 1965 to 1966 represents the second year following completion of reservoir construction. From 1965 to 1966, the full value of property in Barren County decreased from \$112,844,000 to \$111,894,137, a decrease of 0.8 percent (15, 1966). Personal income increased from \$44,437,000 to \$50,280,000, an income increase of 13.1 percent (30, June 10, 1967). The change in income and tax base was much smaller than the increase in the real estate tax levy which increased by 23.6 percent, from \$114,587.88 to \$141,663.62 (12). (Full assessment of property began in 1966, and it was not unusual for local governments to make sizeable increases in the property tax levy.) The income elasticity coefficient for the 1965-66 change is 1.80--elastic. The tax base coefficient is -29.5. Both indices denote an increase in the severity of the property tax from 1965 to 1966.

Period Changes in Tax Severity

As in the Allen County computations, the base and income coefficients for Barren County from 1960 to 1966, give mixed results. Elasticity coefficients computed for the entire period, 1960 to 1966, show how the variables changed from the year prior to reservoir development through the second year

following reservoir development. The full value of property increased from \$85,257,000 to \$111,894,137, an increase of 31.2 percent for the six year period. Personal income increased from \$34,042,000 in 1960 to \$50,280,000 in 1966, an increase of 47.7 percent. During this period, the real estate property tax increased from \$96,414.17 to \$141,663.65, an increase of 46.9 percent. The tax base elasticity for the period is elastic, 1.50, indicating a small increase in tax severity vis-a-vis the tax base. The income elasticity measure for the period is nearly unitary, 0.98, indicating practically no change in the severity of the property tax relative to personal income over the period of reservoir development.

The coefficients computed for 1961-1964, the period of land acquisition show that tax severity diminished. This is shown by the inelastic coefficients of 0.87 for tax base and 0.53 for income. These coefficients are smaller than those for the 1960-1966 period which include the large tax increases in 1965 and 1966.

THE EFFECT OF THE BARREN RIVER RESERVOIR ON THE PROPERTY TAX REVENUE OF THE ALLEN COUNTY SCHOOL SYSTEM

It is the purpose of this section to measure the effect on Allen County School property tax revenue resulting from the purchases of land for the Barren River Reservoir. The measures employed to assess this effect are the tax base and personal income elasticity coefficients for annual changes in the data during the period of reservoir development, and the change over the entire period of reservoir development.

Allen County has a county school district and an independent school district. The county school district serves the rural area of Allen County and the independent school district serves the municipal area of Scottsville. For the study, only the county school district is relevant because it is the only district dependent on rural property for tax revenue; only rural property was acquired for the Barren River Reservoir.

From school year 1960-61 to school year 1966-67, the enrollment in the Allen County School district increased from 1,965 to 2,119, an increase of 7.8 percent (14). During this period the average daily attendance increased by 14.5 percent, from 1,727.0 to 1,979.9. This enrollment increase was not caused by students entering the Allen County system because of reservoir construction, but was largely due to a shift of students from Scottsville.

During the 1960 to 1966 period, total expenditures in the Allen County School system increased by 71.2 percent, from \$565,634.51 to \$967,272.02. Total revenue receipts increased from \$519,280.98 to \$939,349.71, an increase of 80.9 percent (14).

Annual Changes in Tax Severity

In 1960, the general property tax provided \$76,015.97 for the Allen County School system. In 1961, the general property tax increased to \$78,629.84, an increase of 3.4 percent over the previous year (14). From 1960 to 1961, the full value of property in Allen County increased from \$27,168,000 to \$31,080,000, an increase of 14.4 percent (15). During the same period, personal income decreased from \$12,879,000 to \$12,019,000, a decrease of 6.7 percent (30, June 10, 1962). The tax base elasticity coefficient for the annual change is 0.24, very inelastic. The coefficients are summarized in Table 4. In terms of the increase in the tax base, the severity of the school property tax diminished. However, because of the

TABLE 4

INDICES OF TAX CAPACITY AND TAX SEVERITY
FOR ALLEN COUNTY SCHOOL SYSTEM, 1960-66

Year	Full Value Of Property	Personal Income	General School Property Tax	Elasticity Coefficients	
				Tax Base	Income
1960	\$27,168,000	\$12,879,000	\$76,615.97	$\frac{3.4}{14.4} = 0.24$	$\frac{3.4}{-6.7} = -0.51$
1961	31,080,000	12,019,000	78,629.84	$\frac{2.3}{9.0} = 0.26$	$\frac{2.3}{5.1} = 0.45$
1962	33,868,000	12,637,000	80,433.70	$\frac{6.3}{-3.4} = -1.85$	$\frac{6.3}{4.6} = 1.37$
1963	32,718,000	13,218,000	85,542.88	$\frac{6.3}{7.5} = 0.84$	$\frac{6.3}{5.7} = 1.11$
1964	35,163,000	13,967,000	90,963.01	$\frac{6.7}{5.4} = 1.24$	$\frac{6.7}{11.4} = 0.59$
1965	37,068,000	15,567,000	97,083.46	$\frac{19.1}{6.4} = 2.98$	$\frac{19.1}{14.1} = 1.35$
1966	39,860,151	17,760,000	115,662.70		
1961-1964				$\frac{15.8}{13.1} = 1.21$	$\frac{15.8}{16.2} = 0.97$
1960-1966				$\frac{52.2}{45.2} = 1.15$	$\frac{52.2}{37.9} = 1.38$

SOURCES: Kentucky Department of Education and Sales Management,
Inc.

decrease in personal income, the personal income coefficient is -0.51 , perversely inelastic. In terms of personal income, the severity of the property tax increased for taxpayers from 1960 to 1961.

In 1961, about 40.0 percent of the land needed for the reservoir was acquired. The full value of property increased from \$31,080,000 in 1961 to \$33,868,000 in 1962, an increase of 9.0 percent (15, 1962). Personal income, following the end of the recession, increased by 5.1 percent during the same period, from \$12,019,000 to \$12,637,000. The general property tax increased from \$78,629.84 to \$80,433.70, an increase of 2.3 percent (14). The tax base elasticity coefficient for the annual change from 1961 to 1962 is 0.26--inelastic. The income elasticity coefficient is also inelastic--0.45. The coefficients computed for the first annual change following the removal of the first increment of land from the tax rolls show that the severity of the property tax did not increase relative to the tax capacity measures.

In 1962, approximately 20.0 percent more of the needed acreage was removed from the tax rolls. In 1963, the full value of property in the Allen County School district decreased from \$33,868,000 in 1962 to \$32,718,000 in 1963, a decrease of 3.4 percent (15, 1964). The personal income for the 1962-63 annual change increased from \$12,637,000 to \$13,218,000, an increase of 4.6 percent (30, June 10, 1964). The change in property taxes was from \$80,433.70 to \$85,542.38, an increase of 6.3 percent. The tax base elasticity coefficient is -1.85 for the 1962-63 annual change, and the income elasticity coefficient is 1.37. These coefficients indicate an increase in the severity of the property tax from 1962 to 1963.

Practically all of the remainder of the needed land was acquired in 1963, about 40.0 percent of the total. However, the full value of property increased from \$32,718,000 to \$35,163,000, an increase of 7.5 percent from 1963 to 1964 (15, 1964). Personal income increased from \$13,218,000

to \$13,967,000, an increase of 5.7 percent during the same period (30. June 10, 1965). The property tax increased by 6.3 percent, from \$85,542.88 to \$90,542.88, the same as the previous yearly increase (14). The elasticity coefficients are 0.84 for the tax base and 1.11 for personal income. These coefficients indicate an almost unitary relationship between the change in taxes and the change in tax base and personal income.

From 1964 to 1965, the general property tax increased from \$90,963.01 to \$97,083.46, an increase of 6.7 percent (14). The full value of property increased by 5.4 percent, from \$35,163,000 to \$37,068,000, a smaller increase than in the previous year (15, 1966). Personal income during the same period increased from \$13,967,000 to \$15,567,000, an increase of 11.6 percent, considerably more than the increase in the previous year (30, June 10, 1966). The tax base coefficient for this change is 1.24, slightly elastic, indicating a small increase in severity of the tax. However, the large increase in personal income caused the income coefficient to be inelastic, 0.59, denoting a reduction in tax severity vis-a-vis the increase in personal income.

In 1964, the construction of the Barren River Reservoir was completed. Hence, the change from 1965 to 1966 followed completion of the reservoir. The full value of property subject to school taxes increased from \$37,068,000 to \$39,860,151, an increase of 6.4 percent (15, 1966). Personal income increased from \$15,567,000 to \$17,760,000, an increase of 14.1 percent (30, June 10, 1967). However, the general property tax increased by 19.1 percent, from \$97,083.46 to \$115,662.70 (14), during the first year of full value assessment. The tax base coefficient for the 1966-67 change is 2.98, very elastic. The income elasticity coefficient is 1.35, also elastic. Both coefficients denote an increase in tax severity from the previous year's change.

Period Changes in Tax Severity

The coefficients of elasticity, income and base, evince a fairly consistent pattern of behavior over the period of time studied, 1960 through 1966. Most of the later coefficients are elastic, indicating an increase in property tax severity. However, most of the earlier annual changes yield inelastic coefficients. The coefficients of income and base are computed for the entire period to measure the change in tax severity vis-a-vis the change in tax capacity. Over the period of time studied, 1960-66, the value of taxable property increased by 45.2 percent, from \$27,168,000 to \$39,860,151. During the same period -- 1960-66--the full value of all property in Kentucky increased by 34.9 percent. The tax base was increasing faster than the statewide average in spite of the acreage lost from the tax rolls. Personal income increased from \$12,879,000 to \$17,760,000, an increase of 37.9 percent. However, the general school property tax increased by 52.2 percent, from \$76,015.97 to \$115,662.70. This increase in school property taxes is much larger than the increase for the state which was 38.2 percent for the same time period (15). The coefficient of base elasticity for the entire period is 1.15, slightly elastic. The coefficient of income elasticity is 1.38, also, slightly elastic. Both measures indicate a slight increase in severity of the school property tax in Allen County for the entire period studied.

The elasticity coefficients for the period of land acquisition, 1961 to 1964, show a slight difference in severity in comparison to the coefficients for the entire period studied, 1960 to 1966. During the phase of land acquisition the tax base coefficient is 1.21, denoting practically the same tax severity as for the entire period--1.15. On the other hand, the income elasticity coefficient is 0.97, slightly inelastic as compared to the coefficient of 1.38 for the entire period. In 1965 and 1966, taxes rose sharply but this was also a period of sizeable growth in personal income.

THE EFFECT OF THE BARREN RIVER
RESERVOIR ON THE PROPERTY TAX
REVENUE OF THE BARREN COUNTY
SCHOOL SYSTEM

There are three school districts in Barren County--Barren County, Caverna, and Glasgow Independent. Of the three school systems only Barren County is relevant to this study as it was the only one that experienced a physical loss of tax base to the Barren River reservoir. None of the three school systems experienced any increase in expenditures because of reservoir construction.

From school year 1960-61 through school year 1966-67, the enrollment of the Barren County School system increased from 3,442 to 3,469, an increase of only 0.5 percent (14). During the same period, average daily attendance increased from 3,236.7 to 3,334.0, an increase of 3.1 percent (14).

The total expenditures of the Barren County School system from 1960 to 1966, increased from \$1,208,437.52 to \$1,518,836.89, an increase of 25.7 percent. During the same period, total revenue receipts increased from \$931,025.45 to \$1,470,579.80, an increase of 57.7 percent (14).

Annual Changes in Tax Severity

In 1960, the general property tax yielded \$174,830.41 to the Barren County School system. By 1961, the general property tax increased to \$188,129.82, an increase of 7.6 percent (14). From 1960 to 1961, the full value of property in the school district increased from \$67,259,000 to \$71,253,000, an increase of 5.9 percent. Personal income in Barren County from 1960 to 1961, increased by only 0.3 percent, from \$34,047,000 to \$34,162,000; this small increase was due largely to the small recession of 1960-61 (30, June 10, 1962). The base elasticity coefficient for the 1960-61 change is 1.29-- slightly elastic. The personal income coefficient is very

elastic--25.3. The change from 1960 to 1961 is the last change prior to land purchases and construction of the Barren River Reservoir. The coefficients show an increase in tax severity for the 1960 to 1961 change, relative to personal income and property assessment.

In 1961, land purchases began with approximately 40.0 percent of the necessary land purchased. This land, purchased in 1961, was off the tax assessment rolls in 1962. The physical loss of the land in 1961 was noted in a decrease in the full value of property in 1962, decreasing from \$71,253,000 to \$69,669,000, a decrement of 2.2 percent (15, 1962). However, during the same period, there was only a minuscule increase in the general property tax from \$188,129.82 to \$188,652.60, an increase of only 0.3 percent (14). The coefficient of elasticity for the tax base is -0.13, indicating an increase in severity of the tax vis-a-vis the capacity measure of tax base. The coefficients for the Barren County School system are summarized in Table 5.

Growth in personal income went from \$34,162,000 in 1961 to \$36,426,000 in 1962, an increase of 6.6 percent (30, June 10, 1963). The personal income coefficient is very inelastic--0.04. The change in the income elasticity coefficient evinces a marked decrease in tax severity because of the small increase in the general property tax from 1961-1962.

In 1962, additional land purchases were made-- about 20.0 percent of the total acquired. This additional loss of land was not enough to cause a diminution of full value assessment as the value of property increased from \$69,669,000 in 1962 to \$73,045,000 in 1963, an increase of 4.8 percent (15, 1964). Personal income increased by 6.6 percent from \$36,426,000 to \$38,818,000 (30, June 10, 1964). The general property tax increased by 3.4 percent from \$188,652,000 to \$195,004.81 (14). The coefficients of elasticity are both inelastic for the 1962-63 change

TABLE 5

INDICES OF TAX CAPACITY AND TAX SEVERITY
FOR BARREN COUNTY SCHOOL SYSTEM, 1960-66

Year	Full Value Of Property	Personal Income	General School Property Tax	Elasticity Coefficients	
				Tax Base	Income
1960	\$67,259,000	\$34,047,000	\$174,830.41	$\frac{7.6}{5.9} = 1.29$	$\frac{7.6}{0.3} = 25.3$
1961	71,253,000	34,162,000	188,129.82	$\frac{0.3}{-2.2} = -0.13$	$\frac{0.3}{6.6} = 0.04$
1962	69,669,000	36,426,000	188,652.60	$\frac{3.4}{4.8} = 0.71$	$\frac{3.4}{6.6} = 0.52$
1963	73,045,000	38,818,000	195,004.81	$\frac{4.2}{9.2} = 0.46$	$\frac{4.2}{6.3} = 0.67$
1964	79,734,000	41,275,000	203,098.57	$\frac{8.7}{12.4} = 0.70$	$\frac{8.7}{7.6} = 1.14$
1965	89,579,000	44,437,000	220,846.52	$\frac{16.6}{-3.0} = -5.53$	$\frac{16.6}{13.1} = 1.27$
1966	86,848,566	50,280,000	257,617.68		
1961-1964				$\frac{7.1}{11.9} = 0.60$	$\frac{7.1}{20.8} = 0.34$
1960-1966				$\frac{47.3}{29.1} = 1.62$	$\frac{47.3}{47.7} = 0.99$

SOURCES: Kentucky Department of Education and Sales Management,
Inc.

--0.71 for the tax base and 0.52 for personal income. The coefficients denote a decrease in tax severity for the 1962-63 change.

In 1963, approximately all of the remainder of the needed land was acquired, about 40.0 percent of the total. This decreased the physical size of the tax base, in terms of acreage, subject to the 1964 assessment. The physical loss of land in 1963 did not diminish the assessment of property which increased from \$73,045,000 in 1963 to \$79,734,000 in 1964, an increase of 9.2 percent (15, 1966). Personal income increased by 6.3 percent, from \$38,818,000 to \$41,275,000, during the same period (30, June 10, 1965). The general property tax increased from \$195,004.31 to \$203,098.57, an increase of only 4.2 percent (14). Again, as in 1963, both elasticity coefficients are inelastic; the tax base coefficient is 0.46, and the personal income coefficient is 0.67. Relative to income and tax base the severity of the general property tax diminished from 1963 to 1964.

Reservoir construction was completed in 1964. The full value of property from 1964 to 1965, increased by 12.4 percent, from \$79,734,000 to \$89,579,000 (15, 1966). Personal income increased by 7.6 percent, from \$41,275,000 to \$44,437,000. The general property tax increased from \$203,846.52 to \$220,846.52, an increase of 8.7 percent. The coefficient of elasticity for the tax base is 0.70, and the personal income coefficient is 1.14. The severity of the tax increase from 1964 to 1965 is inelastic with respect to the tax base. However, the property assessment in 1965 may well have been too large and thus required the adjustment shown in the 1966 assessment. The coefficient of the tax increase relative to personal income was elastic, 1.14, suggesting a slight increase in tax severity from 1964-1965.

The change in the data from 1965 to 1966 followed completion of the reservoir. In 1966, the full value assessment of property decreased from

\$89,579,000 to \$86,848,500, 3.0 percent, suggesting, possibly, an over-assessment of property in 1965 (15, 1966). Personal income increased from \$44,437,000 to \$50,280,000, an increase of 13.1 percent (30, June, 10, 1967). The general property tax increased by the largest annual amount for the period studied, from \$220,346.52 to \$257,617.68, an increase of 16.6 percent (14). The tax base coefficient for the 1965-66 change is -5.53, indicating a marked increase in the severity of the property tax relative to the change in the tax base. The personal income coefficient denotes a slightly elastic relationship between the change in taxes and the change in income--1.27.

Period Changes in Tax Severity

About one-half of the annual elasticity coefficients for the period studied, 1960 to 1966, are inelastic. However, from 1960-1966, the full value of property subject to taxation by the Barren County School system increased from \$67,259,000 to \$86,848,566, an increase of 29.1 percent. Personal income increased, during the same period, from \$34,047,000 to \$50,280,000, an increase of 47.7 percent. The general property tax increased from \$174,830.41 to \$257,617.68, an increase of 47.3 percent. In Barren County, as in Allen County, the increase in the school property tax was larger than the increase of 38.2 percent for the state. The tax base coefficient computed for the ratio of the tax change to the base change is 1.62--slightly elastic. The personal income computed for the ratio of the tax change to the personal income change in almost unitary--0.99. The tax base elasticity coefficient shows a slight increase in tax severity, and the personal income elasticity coefficient shows an almost unitary relationship between the increase in the general property tax and the increase in personal income.

From 1961 to 1964, virtually all of the annual elasticity coefficients are inelastic for the Barren County School system. For the phase of land acquisition the tax base coefficient is 0.60 and the income coefficient is 0.34. Both coefficients are markedly smaller than the coefficients for the entire period, 1960 to 1966. This difference is due to the large increase in school taxes (26.9 percent) in 1965 and 1966, and the 3.0 percent decrease in tax base in 1966. The 1961 to 1964 elasticity coefficients show a diminishing severity as acreage was lost from the tax assessment rolls.

COMPARISON OF THE SEVERITY OF COUNTY AND SCHOOL TAXES IN ALLEN AND BARREN COUNTIES WITH THE STATE AVERAGES

Comparison of the tax severity measures of Allen and Barren County governments with those of the state (all counties) show these two counties to have a smaller increase in tax severity from 1960 to 1966 than did the state. Allen County and Barren County had considerably less elastic coefficients than the state, 1.26 and 1.50 compared to 2.45 (Table 6). The income elasticity coefficient of Allen County government is slightly larger 1.50 to 1.40, than the state average coefficient, denoting slightly greater increase in severity of the property tax in Allen County. However, comparison of the income elasticity coefficient in Barren County with that for the state shows a much smaller coefficient (0.98), denoting an almost unitary relationship between the property tax and income.

Comparison of the Allen County and Barren County School districts with the state averages give mixed results. The tax base coefficient in Allen County is smaller, 1.15 as compared to the state coefficient of 1.35. In Barren County the tax base coefficient is larger, 1.62 as compared to the state figure of 1.35. The severity measures are just the opposite in the comparison of income elasticity measures. The Allen County income

TABLE 6
 COMPARISON OF TAX SEVERITY INDICES IN
 ALLEN AND BARREN COUNTY GOVERNMENTS,
 ALLEN AND BARREN COUNTY SCHOOL SYSTEMS
 WITH TAX SEVERITY INDICES OF KENTUCKY
 COUNTIES AND SCHOOLS, 1960-1966

Taxing Jurisdiction	Base Elasticity Coefficients	Income Elasticity Coefficients
Allen County	1.26	1.50
Barren Counties	1.50	0.98
All Counties	2.45	1.40
Allen County Schools	1.15	1.38
Barren County Schools	1.62	0.99
All Schools	1.35	1.29

SOURCES: Kentucky Department of Education
 Kentucky Department of Revenue, and
 Sales Management, Inc.

elasticity coefficient is slightly larger than the state coefficient, 1.38 to 1.29. The Barren County income coefficient is much less than the state average, 0.99 as compared to 1.29. In the Allen County School system the tax base grew faster than the tax base in the Barren County system, 45.2 percent to 29.1 percent, from 1960 to 1966. Just the opposite occurred with income growth: income increased by 37.9 percent in Allen County and 47.7 percent in Barren County.

SUMMARY AND CONCLUDING REMARKS

This chapter examined the effect of the Barren River Reservoir on property taxes levied by the two county governments and the two school districts located in these counties. There was no change in expenditures of these local governments due to reservoir construction. The municipal governments and independent schools were not effected in any way--neither revenues nor expenditures--by the Barren River Reservoir.

Right-of-way was acquired over a three year period from 1961 through 1963. The land acquisition in these three years diminished the physical size (acreage) of the tax base in the affected areas beginning with the 1962 assessment. The total period studied encompassed the years from 1960 through 1966. This permitted the examination of one annual change in the tax and income data prior to the initiation of construction and two annual changes following reservoir completion. The impact on property tax revenue was indexed by elasticity coefficients computed for the property tax payments vis-a-vis the changes in personal income and full value of the tax base. This allows analysis of changes in the severity of the tax as annual changes take place in these variables. Lastly, the coefficients were computed for changes in the variables over the entire period studied as well as over the three-year period of land acquisition.

The local officials in Allen County were apprehensive before the reservoir was built about the effect the reservoir would have on their fiscal situation. On October 6, 1960, the Allen County Fiscal Court passed a resolution asking their representative in Congress to attempt to minimize the disadvantages created in the county by the dam and to secure adequate compensation for affected landowners (31). The year to year changes in the elasticity coefficients give mixed results as to the severity of the financial impact created by the loss of land from the tax rolls in Allen County. The years of increase in tax severity were from 1962 to 1963, the second year of land acquisition; and the change from 1965-1966, the second annual change in the data following completion of reservoir construction. The elasticity coefficients computed for the entire time period, 1960 to 1966, are slightly elastic, suggesting an increase in severity of the property tax. The tax base elasticity coefficient for Allen County Government is 1.26 for the entire period. The income elasticity coefficient gives similar results, 1.50, also slightly elastic for the 1960 to 1966 change. The elasticity coefficients for the land-acquisition period are very inelastic, 0.24 for tax base and 0.19 for income, showing that proportionately larger tax increases relative to tax base and income occurred in the years immediately following land acquisition. In the last year of land acquisition the property tax rate was reduced from .60 to .54 per \$100 of assessed valuation. Relative to the increase in severity for all counties the increase in tax severity in Allen County is extremely small.

The elasticity coefficients computed for the annual changes in the variables from 1960 to 1966, in Barren County, show that the severity of the tax increased in the 1961-62 change and the 1965-66 change. From 1961 to 1962 and 1965 to 1966, the tax base elasticity coefficients are perversely elastic, indicating a large increase in the severity of the tax with respect to the base. These decreases were caused by small decrements in property

assessment. The personal income coefficient is also elastic for the 1965-66 but not the 1961-62 annual change. The changes in the data over the entire period show the tax base coefficient to be elastic, 1.50, and the income coefficient to be almost unitary, actually 0.98. The loss of assessment seems to have increased the severity of the property tax relative to the tax base. The 12,581 acres acquired for the reservoir in Barren County would have added approximately three million dollars to the property assessment in 1966, assuming the reservoir had not yet had an impact on property values, and assessing land at the 1966 rate. However, as in Allen County, tax increases were much larger in the years immediately following land acquisition. The coefficients for the land acquisition period are 0.87 for tax base and 0.53 for income--inelastic.

The tax levy by the Allen County school system increased very rapidly during the period of study; revenue receipts increased by 80.9 percent and expenditures by 71.2 percent. The elasticity coefficients computed for the period were about half elastic, and in some few instances were perversely elastic. The average annual percentage increase in the general property tax in Allen County Schools from 1960 through 1966, was 7.4 percent. Very few counties can expect their personal income and taxable base to maintain this rate of increase, even during a period of rapid economic growth. The severity of the general property tax increased slightly for the entire period studied. The tax base coefficient for the 1960-66 change is 1.15, and the personal income coefficient is 1.38, both measures being elastic. The coefficients computed for the period of land acquisition, 1961-64, denote essentially the same degree of severity as those computed for the 1960-66 period, 1.21 and 0.97 for tax base and income respectively. The loss of assessment did exacerbate tax severity for the Allen County School system during the short-run period covering reservoir land-buying and construction. Compared, however, to the increase for the state during the same period,

the tax severity for the Allen County School system was smaller. The tax base in Allen County did, in fact, grow at a faster rate: 46.7 percent compared to 27.9 percent for the state.

Expenditures and revenue receipts did not increase as rapidly in the Barren County School system as in the Allen County system. Expenditures increased by 25.7 percent and revenue receipts by 57.7 percent from 1960-1966. The general property tax in the Barren County School system increased at an annual rate of 6.0 percent, less than the 7.4 percent rate in Allen County, during the same period. The most critical change in Barren County School taxes occurred in the 1965 to 1966 change when the assessment decreased by 3.0 percent and the general property tax increased by 16.6 percent. These changes yield a perverse tax base coefficient of -5.53. The change in assessment from 1965 to 1966, compared with the change in assessment from 1964 to 1965, suggests a possible over-assessment in 1965, as the assessment increased by 12.4 percent from 1964 to 1965, and decreased by 3.1 percent from 1965 to 1966. The tax base coefficient computed for the entire period shows a small increase in tax severity: the coefficient is 1.62--elastic. The income elasticity coefficient is almost unitary, 0.99, indicating almost the same proportionate changes in income and general property taxes occurred over the period. Because of the large increases in school taxes in 1965, 26.9 percent, the coefficients computed for the period of land acquisition are considerably smaller, the tax base coefficient is 0.60 and the income coefficient is 0.34. These coefficients denote a marked decrease in severity from 1961 to 1964.

Although more land was acquired in Barren County than in Allen County-- 12,581 acres and 7,528 acres respectively-- the percentage of land was nearly the same: 3.0 percent of the Allen County land area and 4.0 percent of the Barren County land area.

The assessed value of property increased at a much faster rate in Allen County than in Barren County. The faster increase can be partially explained by the method of assessment used in Allen County, but seemingly not in Barren County. In Allen County, during the phase of land acquisition, a partial loss of a farm did not result in a proportionate decrease in assessment; for example, if fifty percent of a farm was purchased for the reservoir, the assessment may have been reduced by only twenty percent (31). Ostensibly, no particular formula was followed but the adjustment seemed to be based on what could be obtained without an adverse reaction by the taxpayer. Another reason for the large increase in assessment was the improvements made on the remainder of affected farms which increased their value. Farmers selling part of their farm would use the proceeds to finance improvements on the remainder leading to an assessment increase. These two reasons--small increases in per acre assessments of the remainder of farms and farm improvements-- helped mitigate the loss in property assessments in Allen County during reservoir construction from land taken from the assessment rolls.

In Barren County the assessment of property did not increase as rapidly as the assessment in Allen County, but the growth ratio in income was much larger. From 1960 to 1966, personal income grew at an annual rate of about 9.5 percent in Barren County as compared to a 6.0 percent growth rate in Allen County. During the same period, personal income in the state increased at an annual rate of about 4.5 percent. The growth in personal income in Barren County made it easier for the taxpayers to pay the increased property taxes. The growth in income was almost proportionate to the increase in taxes.

In Allen County the loss of land from the tax rolls occurred simultaneously with an increase in the severity of property taxes vis-a-vis personal income and, to a lesser extent, relative to the tax base. The situation in Barren County was just the opposite: an increase in severity relative to the tax

base, and a neutral effect with respect to personal income. Over-all comparison with the tax severity measures for the state shows that Allen and Barren Counties experienced a smaller tax severity increase. These comparisons indicate no lack of tax revenue and, therefore agrees with the hypothesis as stated in Chapter II, that reservoir land purchases do not **diminish** the capacity of people in the affected jurisdictions to pay property taxes.

CHAPTER IV
THE GREEN RIVER RESERVOIR

The second case study concerns the impact of the Green River Reservoir on the property tax revenue and expenditure of the affected local units of government in Adair and Taylor Counties in south-central Kentucky. The dam is located on the Green River in Taylor County about three miles downstream from the Adair-Taylor County line on Highway 55 (Figure 6). The reservoir was authorized under the flood control plan for the Ohio River Basin in the Flood Control Act of June 28, 1938. Construction began in 1964 and was essentially complete by the end of 1968.

In 1958, the people of Adair and Taylor counties learned the dam would soon be located in these two counties. Some of the local people were apprehensive about the effect of the reservoir on property tax revenue, displacement of people, and loss of property.¹ The Corps of Engineers attempted to allay the adverse feelings of the local citizens by holding a number of meetings to explain the various beneficial features of the reservoir including flood control, abundance of water supply for industry, and recreation. According to Corps of Engineers officials, the resulting benefits would return \$2.50 for every \$1.00 invested (31).

¹The uprooting of people involves more than the simple loss of houses and property for which adequate compensation is received. Henry and Janice Holt Giles in A Little Better than Plumb (Houghton-Mifflin:New York, 1963) express the anger and frustration felt by the authors when they learn their house is on land that will be inundated by the reservoir. Their anguish is not caused by any sense of monetary loss, but a loss of something far too sentimental to be compensated for by pecuniary payment.

Some preliminary work on the Green River Dam began in late 1963, and construction started in 1964. Land purchases were spread over slightly more than four years, and construction work was not completed until the end of 1968. From 1965 through 1968, about 150 to 200 men, on the average, were employed in the various phases of reservoir construction. The total cost of the reservoir was \$30,400,000 (22).

The reservoir necessitated the relocation of 12.4 miles of state highways, 8.6 miles of country roads, 5 bridges, 3.95 miles of power lines, 10 miles of pipelines, 3.3 miles of telephone lines, 2,055 graves, and 415 families. (The relocation costs necessitated by the reservoir were paid for from federal funds allocated for the project.) Of the 415 families relocated, about 225 lived in Adair County and 190 in Taylor County (31).

A BRIEF DESCRIPTION OF ADAIR AND TAYLOR COUNTIES

Adair County is located in the south-central section of Kentucky; the southern tip of the county is about twenty miles from the Kentucky-Tennessee border. It is bordered by Taylor County on the north, by Casey County on the northeast, by Russell County on the east, by Cumberland County on the south, by Metcalfe county on the west, and by Green County on the northwest. Taylor County lies directly north of Adair County and is also bounded on the north by Marion County, on the west by Green and Larue Counties, and on the east by Casey County.

The population of Adair County has shown a rather steep decline since 1940 (Appendix B). In 1940, the population was 18,566; in 1960 the population had declined to 14,699 (21). In 1967, the population of Adair County was estimated at 14,000 (30). In contrast, the population of Taylor County has increased during the same time period. In 1960, the population was 16,285; in 1967, the population was estimated at 16,800 (30).

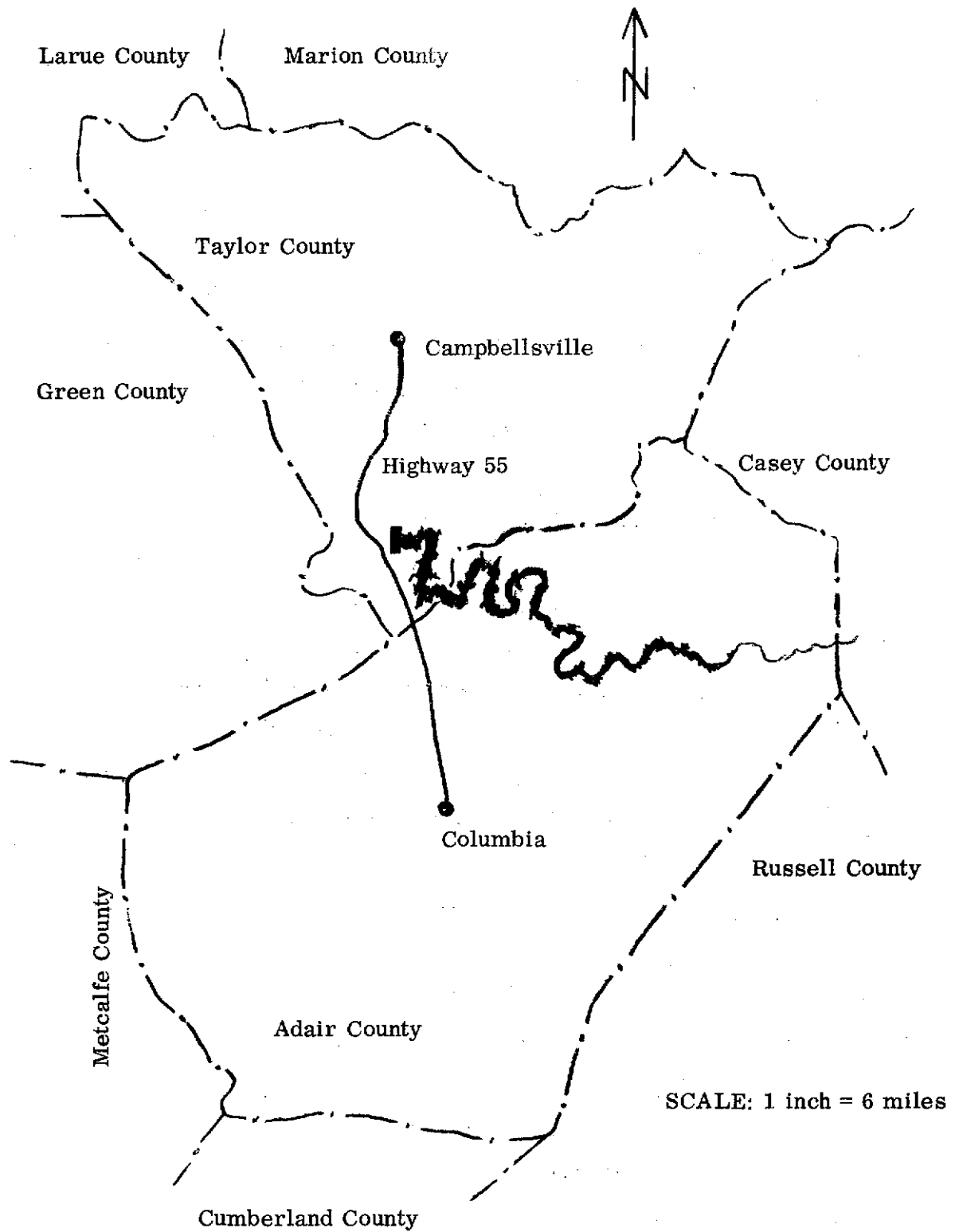


FIGURE 6: The location of the Green River Reservoir

The primary industry in Adair and Taylor Counties is agriculture. Of the two, however, Adair county has a larger proportion of workers employed in agriculture. In 1964, 194,481 acres of the 251,520 acres in the county were used for agricultural purposes (19). In the same year, in Taylor county, 154,102 acres of land of a total of 181,760 of land were used for agricultural purposes (19). The average value per acre of farm land in Adair County increased from \$85.39 in 1959 to \$136.28 in 1964, an increase of 60.0 percent (19). In Taylor County, during the same period, per acre value of farm land increased from \$130.52 to \$198.67, an increase of 52.2 percent (19).

The Green River Reservoir removed 16,417 acres of farm land from the tax rolls in Adair County; approximately 6.5 percent of the total county area (251,520 acres), and 8.4 percent of the farm land (194,481 acres). The federal government paid \$3,365,109 for the land in Adair County, an average price of \$204.98 per acre (28). In Taylor County, 16,109 acres of farm land were acquired. This represents 8.8 percent of the total county area (181,760 acres), and 10.4 percent of the farm acreage (154,102 acres). The total price paid for land in Taylor County was \$3,878,745, an average of \$240.78 per acre (28).

Selected indicators show a higher level of economic attainment in Taylor than in Adair County. In 1960, per capita income in Adair County ranked ninety-seventh of 120 counties in Kentucky while Taylor County ranked forty-second (13). In 1964, the year that construction began on the Green River Reservoir, per capita income in Adair County was \$1,185 (30, June 10, 1965). This was only seventy percent of the state average of \$1,687 (30, June 10, 1965). The state average was only 12.0 percent above the per capita income level in Taylor County of \$1,505. In 1967, the per capita income of Adair and Taylor County was \$1,660 and \$2,086, respectively (30, June 10, 1968).

The lower level of income in Adair County is largely attributable to the dearth of available industrial jobs. In Taylor County there has been a surge of economic growth since 1960 as more than 2,000 industrial jobs have been created (31).

THE EFFECT OF THE GREEN RIVER RESERVOIR ON ADAIR COUNTY PROPERTY TAXES

It is the purpose of this section to investigate the effect of land acquisition for Green River Reservoir on the property tax revenue of the Adair County Government. The analysis proceeds in terms of tax severity as measured in terms of annual property tax changes vis-a-vis changes in the tax base and personal income. The ratio of the percentage change in property taxes to the percentage change in these measures of capacity yields elasticity coefficients which are used to gauge the severity of the property tax. These coefficients are summarized on Table 7.

Federal land purchases in Adair County were spread over a four year period, 1964 through 1967. Approximately one-fourth of the necessary land was purchased in each of the four years--1964, 1965, 1966, 1967. About 4,100 acres of land were removed from the tax rolls in each of the four enumerated years for a total of 16,417 acres by the end of 1967. The purchase of land first removed farm land from the tax assessment rolls in 1965, with the total acreage removed not completed until the end of 1967. The short-run impact resulting from land removed from the tax rolls would be expected to be most severe toward the end of this period, in 1967 and 1968.

Annual Changes in Tax Severity

The last year before any land was removed from the tax rolls was 1964. Beginning in year 1965, there was a diminution in the physical size of the

TABLE 7

INDICES OF TAX CAPACITY AND TAX SEVERITY
FOR ADAIR COUNTY, GOVERNMENT, 1963-1967

Year	Full Value Of Property	Personal Income	Real Estate Tax Levy	Elasticity Coefficients	
				Tax Base	Income
1963	\$48,036,000	\$15,237,000	\$57,581.48	$\frac{1.3}{10.7} = 0.12$	$\frac{1.3}{6.2} = 0.21$
1964	53,155,000	16,241,000	58,337.37	$\frac{1.5}{12.6} = 0.12$	$\frac{1.5}{6.7} = 0.22$
1965	59,860,000	17,334,000	59,195.47	$\frac{13.8}{16.6} = 0.83$	$\frac{13.8}{11.1} = 1.24$
1966	69,779,191	19,251,000	67,389.54	$\frac{1.2}{5.6} = 0.22$	$\frac{1.2}{20.8} = 0.06$
1967	73,683,226	23,246,000	68,191.32		
1963-1967				$\frac{18.4}{53.4} = 0.34$	$\frac{18.4}{52.1} = 0.35$

SOURCES: Auditor of Public Accounts, Kentucky Department of Education, and Sales Management, Inc.

tax base by the approximately 4,104 acres purchased by the federal government in 1964. The changes on Table 7 occurring from 1963 to 1964 are the last prior to the land acquisition. In 1963, the real estate assessment in Adair County was \$8,225,855. Of the total real estate assessment, farms and acreage were assessed at \$5,785,165, 70.3 percent of the total (12). The nominal tax rate per \$100.00 of assessed valuation was .70, yielding a real estate tax levy of 57,581.48 (12). Of the total tax levy, farms and acreage account for approximately 40.0 percent. In 1964, the real estate assessment in Adair County was \$8,333,910. The assessed value of farms and acreage was \$5,859,452 (16). The real estate tax levy in Adair County for 1964 was \$58,337.37 an increase of 1.3 percent over the previous year. Of the total tax levy, farms and acreage accounted for \$41,016.16, about the same percentage of the total as in the previous year. From 1963 to 1964, the assessed value of real estate increased by 1.3 percent; since the nominal tax rate did not change, the tax levy on real estate also increased by 1.3 percent. This, of course, is always the result when the nominal tax rate is held constant and the base is changed pari passu to the increment of necessary revenue.

The full value of property subject to taxation in 1963 was 48,036,000 and 53,155,000 in 1964, an increase of 10.7 percent (15, 1964). The ratio of the change in the property tax levy from 1963-64, 1.3 percent, to the change in the full value of the tax base, 10.7 percent, yields an elasticity coefficient of 0.12. Personal income increased from \$15,287,000 in 1963 to \$16,241,000 in 1964, an increase of 6.2 percent (30). The ratio of the change in the property tax levy to the change in personal income yields an income elasticity coefficient of 0.21. The change in taxes relative to both tax base and income indicate a decreased severity in the property tax from 1963 to 1964.

In 1965, the first year of tax assessment following the beginning of land purchases by the federal government, the assessed value of real estate increased to \$8,456,495, and farms and acreage increased to \$5,892,000 (12). In 1964, the U.S. Census of Agriculture valued farm land in Adair County at \$136.28 per acre (19). Farms and acreage were assessed at approximately 22.0 percent of their fair cash value in 1965. The 1965 full value of property was \$59,860,000, an increase over the previous year of 12.6 percent. The property tax levy increased from \$58,337.37 in 1964 to \$59,195.47, an increase of 1.5 percent. The coefficient of tax base elasticity for 1965 is 0.12 indicating a further decrease in tax severity relative to the growth in taxable property. From 1964 to 1965, personal income in Adair County increased by 6.7 percent, yielding an income elasticity coefficient of 0.22, indicating a decrease in tax severity.

In 1966, the full value of property subject to taxation was \$69,779,191, an increase of 16.6 percent over the previous year. The property tax levy increased by 13.8 percent, from \$59,195.47 to \$67,389.54. The base elasticity coefficient is 0.83, slightly inelastic, indicating a growth in the tax base larger than the increase in property taxes. Personal income increased from \$17,334,000 in 1965 to \$19,251,000 in 1966, an increase of 11.1 percent. The income elasticity coefficient is 1.24, slightly elastic, indicating a small increase in tax severity vis-a-vis personal income. In noting that the highest coefficients on Table 7 are for this year, one should keep in mind that this was the year property tax assessment throughout the state shifted from fractional to full assessment.

In 1967, the full value assessment of property increased to \$73,683,226, an increase of 5.6 percent over the previous year. The property tax levy increased from \$67,389.54 to \$68,191.32, an increase of 1.2 percent. The base elasticity coefficient for 1967 is 0.22--inelastic. The tax

increase from 1967 to 1968 was proportionally smaller than the increase in taxable property. Personal income increased during the same period by 20.8 percent, yielding an income coefficient of elasticity of 0.06--very inelastic. The change in the elasticity coefficients, base and income, from the previous year indicate a decreasing severity of the property tax.

By the end of 1967, 16,417 acres of land, the total amount of land acquired for the reservoir in Adair County, had been removed from the property tax rolls. During 1967, approximately 4,104 additional acres of land were removed from the tax rolls, this was reflected in a slight decrease of \$3,496 in the real estate assessment. Compensation for the decrement in property assessment was made by increasing the tax rate per \$100 of assessed valuation from .135 to .146. At a tax rate of .135, the amount of the real estate tax levy would have been \$68,171.41; the higher rate of .146 increased the tax levy to \$73,726.11, an increase of 8.2 percent.

Farms and acreage assessment data are not available for 1968; however, a close approximation of the assessment can be made. Removal of 16,417 acres of land for the Green River Reservoir left a total of 178,064 acres of farm land in 1968. The per acre assessed value of land in 1967 was \$193.26. Multiplying the 1967 per acre assessed value by the number of acres remaining on the tax roll yields an assessed valuation of \$34,412,649 for farms and acreage in 1968, a small increase over the 1967 assessment.² The 16,417 acres of land lost from the property tax

²This line of reasoning assumes that property values would have changed by the same amount in the absence of the reservoir. Owing to the short period of time involved and the infrastructure of the county, this is not an implausible assumption.

rolls over the four years represents a loss of \$3,172,794 of assessed valuation in terms of 1967 acreage assessment, 8.4 percent of the total farms and acreage assessment for 1968. This loss cost the county a potential of only \$4,632 in 1968, at the prevailing tax rate of .146. If the farms and acreage had remained on the assessment rolls, practically the same amount of tax revenue could have been obtained in 1968 by retaining the 1967 tax rate--0.135.

Period Changes in Tax Severity

Relative to the annual changes in personal income and tax base, the severity of the property tax diminished during the period of land acquisition and reservoir construction. (Data for elasticity coefficients were not available beyond 1967, the last years of land purchases.) Essentially all the elasticity coefficients are inelastic for the period studied. For the entire period, 1963-67, the tax base elasticity coefficient is 0.34--inelastic; the income elasticity coefficient is also inelastic--0.35. These coefficients suggest a more rapid increase in tax capacity than in the severity of the real estate tax.

The loss of assessable land in Adair County did, however, occur as the severity of the property tax on real estate increased proportionately more than the increase in other taxes. From 1963 to 1968, real estate taxes increased from \$57,581.48 to \$73,726.11, an increase of 28.0 percent. During the same period, total county taxes--franchise, personal, poll, and real estate--increased from \$103,328.81 to \$119,486.94, an increase of 15.6 percent. On a per capita basis, real estate taxes increased from \$4.20 in 1964, to \$5.26 in 1968, an increase of 25.2 percent; total taxes per capita increased from \$7.54 to \$8.53, an increase of 13.1 percent. In 1964, the total taxes levied by Adair County were \$103,328.81. Of the total, real estate taxes were \$57,581.48, and other taxes were \$45,747.33. In 1968, total taxes in Adair County were \$119,486.94; real estate taxes

were \$73,726.11; and other taxes were \$45,760.83. From 1964 to 1968, the proportion of total taxes provided by real estate increased from 55.7 percent to 61.7 percent; the proportion of other taxes decreased from 44.3 to 38.3 percent. During the reservoir construction period, real estate increased by 10.8 percent its share of total taxes, while losing 8.4 percent of its physical size.

THE EFFECT OF THE GREEN RIVER RESERVOIR ON TAYLOR COUNTY PROPERTY TAXES

The federal purchases of land in Taylor County for the Green River Reservoir followed essentially the same time schedule as in Adair County. Approximately, one-fourth of the total was purchased in each of the years 1964 through 1967. By the end of 1967, 16,109 acres of land had been acquired for the reservoir in Taylor County.

Annual Changes in Tax Severity

From 1963 to 1964--the last yearly change in the data prior to the purchase of farm land for the reservoir--the full value of all property subject to taxation in Taylor County increased from \$61,969,000 to \$66,774,000, an increase of 7.7 percent (15, 1964). The property tax levy, during the same period, increased from \$77,938.15 to \$80,157.43, an increase of 2.9 percent (12). Personal income increased from \$25,172,000 in 1963 to \$27,267,000 in 1964, an increase of 8.3 percent (30, June 10, 1965). The base elasticity of the property tax for the 1963-64 change yields a coefficient of 0.38--very inelastic. The income elasticity of the property tax yields a coefficient of 0.35, also, very inelastic. The elasticity coefficients are summarized in Table 8. Relative to the tax base and personal income the severity of the property tax decreased from 1963 to 1964.

TABLE 8

INDICES OF TAX CAPACITY AND TAX SEVERITY
FOR TAYLOR COUNTY GOVERNMENT, 1963-1967

Year	Full Value Of Property	Personal Income	Real Estate Tax Levy	Elasticity Coefficients	
				Tax Base	Income
1963	\$61,969,000	\$25,172,000	\$77,938.15	$\frac{2.9}{7.7} = 0.38$	$\frac{2.9}{8.3} = 0.35$
1964	66,774,000	27,267,000	80,157.43	$\frac{3.5}{11.2} = 0.31$	$\frac{3.5}{3.2} = 1.09$
1965	74,229,000	28,130,000	82,947.94	$\frac{-9.9}{13.1} = -0.75$	$\frac{-9.9}{12.6} = -0.79$
1966	83,977,752	31,686,000	75,459.58	$\frac{2.6}{7.5} = 0.35$	$\frac{2.6}{10.6} = 0.24$
1967	89,904,709	35,036,000	77,411.64		
1963-67				$\frac{-0.07}{45.1} = 0.00$	$\frac{-0.07}{39.2} = 0.00$

SOURCES: Auditor of Public Accounts, Kentucky Department of
Education, and Sales Management, Inc.

From 1963 to 1964, the assessed value of real estate increased from \$11,229,622 to \$11,451,061, an increase of 2.0 percent; the increase in the gross assessment of real estate was much smaller than the increase in full value--7.7 percent (17). The tax rate per \$100 of assessed valuation was .70, yielding a gross tax levy on real estate of \$77,938.15 and yielding on farms and acreage \$34,110.90, approximately 25 percent of the total tax levy (12).

In 1964, approximately 4,027 acres of land were removed from the tax rolls, decreasing the physical size of the tax base in 1965. The per acre assessed value of land in 1964 was \$30.91 (16). This per acre assessment times the number of acres lost from the tax rolls represents a potential assessment of \$128,502 in 1965. However, the assessed value of real estate increased by 2.9 percent, from \$11,134,022 to \$11,451,061, and farms and acreage assessment increased by 3.6 percent, from \$4,918,095 to \$5,095,965 (16). The real estate tax levy increased from \$80,157.43 in 1964 to \$82,947.94 in 1965, an increase of 3.5 percent (12). The full value of property subject to taxation increased from \$66,774,000 to \$74,229,000 an increase of 11.2 percent. The base elasticity coefficient computed from these data yields a coefficient of 0.31--very inelastic. From 1964 to 1965 personal income increased from \$27,267,000 to \$28,130,000 an increase of 3.2 percent. The income elasticity coefficient for the 1964-65 change is 1.09--slightly elastic.

In 1966, all property was for the first time assessed at 100 percent of full market value. The value of all property subject to taxation in Taylor County was \$83,977,752, an increase of 13.1 percent over the previous year (15). The assessed value of all real estate was \$59,888,552, and that of farms and acreage \$26,325,672 (16). The tax rate per \$100 of assessed valuation was reduced from .70 in 1965 to .126 in 1966 or by 82.0 percent. As the decrease in tax rate more than offset the increase from fractional

to full assessment, the property tax levy dropped from \$82,947.94 to \$75,459.58. (In fact, all Taylor County taxes were reduced from their 1965 level in 1966). This decrease was made possible by a reduction in road fund expenditures from \$61,352.24 to \$47,019.89. For five years previous to 1966, Taylor County had spent annually approximately \$25,000 for road maintenance and road materials, and approximately \$36,000 for the purchase and maintenance of road machinery. In 1966, the expenditures for road machinery was reduced to \$21,342.12, because no machinery purchases were necessary. This allowed nearly a \$15,000 reduction in taxes. The reduction in property taxes was about \$7,500 or 9.9 percent of the total tax levy. The full value of property in 1966 increased by 13.1 percent; and personal income increased by 12.6 percent, from \$28,130,000 to \$31,686,000 (30, June 10, 1967). The base elasticity and income elasticity of this change yield coefficients of -0.75 and -0.79, respectively. From 1965 to 1966, change in the property tax levy was perversely inelastic in relation to the change in taxable property and personal income.

In 1966, an additional 4,027 acres were acquired and removed from the Taylor County tax rolls. The value of all property subject to taxation increased to \$89,904,709, an increase of 7.5 percent over 1966. The real estate assessed value increased from \$59,888,552 to \$61,437,432, an increase of 2.6 percent from the previous year (12). Personal income increased from \$31,686,000 to \$35,036,000, an increase of 10.6 percent. From 1966 to 1967, the property tax levy increased from \$75,458.58 to \$77,411.64, an increase of 2.6 percent. The budget appropriation for Taylor County in 1967-68 was estimated at \$154,664; and the budget appropriation for 1968-69 was estimated at \$163,100. Although these appropriations were larger than appropriations for 1966-67, they are not as large as the budget appropriations for 1964-65 and 1965-66. Road fund expenditures in these two years are estimated at about the same level as those in 1966-67.

With the expansion of taxable property and personal income during the period of land-buying and construction, the severity of the property tax decreased.

Any increase in the severity of the property tax burden should begin to show in the 1967-68 data. However, at the time of this study, the audit of county fiscal data for 1967-68 was not available. The only data available comes from the budget for Taylor County Government. Firm figures are not available for Table 8, but the preliminary data indicates no significant differences in the trend set for the previous years.

Period Changes in Tax Severity

In 1968, the assessed valuation of real estate increased to \$63,228,003 from \$61,437,432 in 1967. The rate of taxation remained the same as the previous two-years--.126. By 1968, a total of 16,109 acres of farm land had been purchased by the federal government for the Green River Reservoir and removed from the tax rolls in Taylor County. Valuing lost acreage at the 1967 per acre assessment, a potential assessment of \$3,041,701 was lost from the tax rolls; at the 1968 rate of assessment (.126), this involves a loss of potential tax revenue of only \$3,833.

From 1964 to 1968, the period of reservoir land-acquisition and construction, the real estate tax levy declined from \$80,157.43 to \$79,667.28, a slight decline of \$490.15. From 1964 to 1967, total taxes per capita declined from \$8.33 to \$7.32. From 1963 to 1967, the real estate tax levy held almost constant to cause both elasticity coefficients to be essentially zero. The data suggest that removal of land for the reservoir did not increase property tax severity, in fact, the severity diminished in Taylor County vis-a-vis tax base and personal income. This conclusion supports the opinion held by county officials that the economic growth in the county during the period of reservoir construction more than compensated for the loss of farm land assessment from the tax rolls (31).

THE EFFECT OF THE GREEN RIVER RESERVOIR
ON THE PROPERTY TAX REVENUE OF ADAIR COUNTY SCHOOLS

Adair County has a consolidated school system with one elementary and one high school. As the population of Adair County has decreased, so has school enrollment and attendance. In school year 1958-59, the Adair County School System had an enrollment of 3,494, and an average daily attendance of 3,070.5 (14). Ten years later, school year 1967-68, the enrollment was down to 2,971, and average daily attendance was down to 2,656.2 (14). During this period, school enrollment decreased by 525, a decrease of 15.0 percent; average daily attendance decreased 424.3, a 16.0 percent decrease. During the period of reservoir construction, 1964 to 1968, enrollment decreased from 3,183 to 2,971, a decrease of 212 students, an annual decrease of 71 students compared to 52 students prior to the reservoir construction period. The accelerated decrease from 1964 to 1968 can be largely attributed to displacement caused by the reservoir. Construction activity did not add to the school enrollment in Adair County as workers located in Campbellsville and Taylor County.

The decrease in school enrollment from 1958-59 to 1967-68, did not keep school expenditures from increasing. Total current expenditures increased 87.7 percent, from \$545,811.21 to \$1,005,934.28 (14). Of even greater magnitude was the increase in total school expenditures--current expenditures plus capital outlay and debt service--from \$595,458.73 to \$1,707,257.80, an increase of 186.7 percent. During the reservoir construction period, current expenditures increased by \$253,357.95, and total expenditures by \$815,160.02 (14). These large increases took place in spite of a decrease in school enrollment.

Associated with the large increases in school expenditures were sizeable increases in property taxes. In school year 1958-59, the income

from the general property tax was \$99,594.64; the income from all school taxes was \$166,726.84 (14).³ In terms of per capita tax payments, the general property tax payment was \$6.96, and the total tax payment was \$11.66. In 1967-68, per capita property tax payments were \$16.83, an increase of 141.8 percent; total taxes per capita increased from \$11.66 to \$23.56, a 102.1 percent increase.⁴

It is the purpose of this section to assess the impact of the Green River Reservoir on the severity of the school property tax in the Adair County School system.

Annual Changes in Tax Severity

From 1963 to 1964, the general property tax payment to the Adair County school system increased from \$168,880.40 to \$169,699.74, an increase of 0.5 percent (14). The change in full value of taxable property increased from \$48,036,000 to \$53,155,000, an increase of 10.7 percent (15, 1964). The change in personal income was from \$15,287,000 to \$16,241,000, an increase of 6.2 percent (30). The change from 1963 to 1964 is the last change prior to removal of land from the tax rolls for the Green River Reservoir. The ratio of the change in school property taxes to the change in tax capacity shows the base coefficient and the income coefficient to be 0.05 and 0.08,

³Total taxes include general property taxes, franchise taxes, bank shares tax, and the poll tax.

⁴The changes in various school finance data for the decade 1958-59 to 1967-68 are given to show the long-term trend although the study is concerned with only the latter half of the period.

respectively. The elasticity coefficients indicate a sizeable reduction in tax severity from 1963 to 1964. These coefficients are summarized in Table 9.

In 1963, the gross value of property subject to taxation was \$13,334,791 (16). The assessment ratio, gross value to full value, was 27.8 percent. In 1964, the gross value of property subject to taxation increased to \$13,760,192, and the assessment ratio decreased to 25.9 (16). The decrease in the assessment ratio during a period of constant tax rate is another indicator of a decrease in the severity of the property tax.

In 1964, the purchase of land for the Green River Reservoir removed approximately 4,104 acres of land from the tax rolls. However, the full value of property increased from \$53,155,000 in 1964 to \$59,860,000 in 1965, and the assessed value of property subject to taxation increased to \$14,214,790 (16). The tax base increased by 12.6 percent yielding a base coefficient of 0.58. Personal income increased from \$16,241,000 to \$17,334,000, an increase of 6.7 percent (30, June 10, 1966). The income elasticity coefficient for the change is 1.09. The results are mixed; the tax change relative to the taxable base change is inelastic, but the tax change relative to personal income is slightly elastic.

In 1966, the assessed value of property subject to taxation was \$68,332,941 (16). (Beginning in 1966, all property was assessed at its full market value.) In 1966, the rate of taxation in the Adair County School system was reduced from 2.00 per \$100 of assessed valuation to 0.439, only 22 percent of the previous tax rate. Going from gross assessment in 1965 to full assessment in 1966, the assessment of all property other than farms and acreage increased by 411 percent, \$8,322,390 to \$34,194,191; the assessment of farms and acreage increased 588 percent, \$5,892,400 to \$34,638,750; and the per acre assessment increased by 600 percent (16). From 1965 to 1966, the gross tax levy on farms and acreage increased

TABLE 9

INDICES OF TAX CAPACITY AND TAX SEVERITY
FOR ADAIR COUNTY SCHOOL SYSTEM, 1963-1967

Year	Full Value Of Property	Personal Income	Real Estate Tax Levy	Elasticity Coefficients	
				Tax Base	Income
1963	\$48,036,000	\$15,287,000	\$168,880.40	$\frac{0.5}{10.7} = 0.05$	$\frac{0.5}{6.2} = 0.08$
1964	53,155,000	16,241,000	169,699.74	$\frac{7.3}{12.6} = 0.58$	$\frac{7.3}{6.7} = 1.09$
1965	59,860,000	17,334,000	182,127.84	$\frac{9.9}{15.0} = 0.66$	$\frac{9.9}{11.1} = 0.89$
1966	68,332,941	19,251,000	200,210.75	$\frac{17.7}{6.4} = 2.77$	$\frac{17.6}{20.8} = 0.85$
1967	72,692,636	23,246,000	235,581.16		
1963-1967				$\frac{39.5}{51.3} = 0.77$	$\frac{39.5}{52.1} = 0.76$

SOURCES: Kentucky Department of Education and Sales
Management, Inc.

from 41.4 percent to 50.3 percent of the total. The tax levy per acre increased from 61.9 cents to 81.6 cents per acre, an increase of 31.8 percent; whereas the increase from 1964 to 1965 was from 60.2 cents to 61.9 cents per acre, an increase of only 2.8 percent. This large increase in the assessment of farm land meant the loss of relatively more potential tax revenue as land was lost from the tax rolls.⁵

From 1965 to 1966, the full value of property increased from \$59,860,000 to \$68,832,941, an increase of 15.0 percent (15, 1966). Personal income increased from \$17,334,000 to \$19,251,000, an increase of 11.1 percent (30, June 10, 1967). The general property tax increased by 9.9 percent, from \$182,127.84 to \$200,210.75 (12). The base elasticity coefficient, for the change is 0.66, and the income elasticity coefficient is 0.89. The change in the severity of the property tax from 1965 to 1966 diminished from the previous year as evidenced by the inelastic coefficients.

By 1967, approximately three-fourths, 12,312 acres, of the total land to be acquired for the reservoir had been purchased. The removal of this much land represents a loss of \$1,744,000 in assessed valuation, valuing the land in terms of the land assessment remaining on the tax rolls--\$188.91 per acre. The loss in assessed valuation was compensated for by increasing the tax rate per \$100 of assessed valuation from 0.439 to 0.458. From 1966

⁵ These computations suggest that the change from fractional assessment to full assessment may have provided county officials an auspicious opportunity to make a large increase in the assessment of farm land in order to qualify for federal school funds as additional land was removed for the reservoir.

to 1967, the assessed value of property subject to school taxation increased from \$68,832,941 to \$72,692,636, an increase of 6.4 percent; however, the assessed valuation of farms and acreage decreased slightly from \$34,638,750 to \$34,413,630 (16).

The amount of general property taxes increased from \$200,210.75 in 1966 to \$235,581.16 in 1967, an increase of 17.7 percent (12). The base elasticity coefficient for the change is 2.77, very elastic, denoting a marked increase in severity of the property tax burden from 1966 to 1967. Personal income increased from \$19,251,000 to \$23,246,000, an increase of 20.8 percent (30, June 10, 1968). The income elasticity of the school property tax from 1966 to 1967 is 0.85, slightly inelastic, indicating a reduction in severity comparable to the previous year's decrease.

Period Changes in Tax Severity

At the time of this study, financial statements of school and property assessments are not available for 1968. However, a reasonable projection of potential tax loss can be made based on 1967 data. By the beginning of 1968, a total of 16,417 acres of land had been purchased for the Green River Reservoir and removed from the tax rolls. Using the 1967 valuation of land per acre, this represents a loss of \$3,101,335 of assessed valuation. At the 1967 tax rate of 0.458 per \$100 of assessed valuation, the lost acreage represents a potential tax revenue of \$15,761.44 (about 6.7 percent of the total property tax revenue in 1967). Even with the rapid acceleration in school expenditures in the past few years, the severity of the property tax in 1968 will probably not cause an increase in tax severity vis-a-vis the measure of tax capacity. The 1963-67 period experienced a decrease in tax severity as denoted by the elasticity coefficients.

During this study, a discussion with local officials revealed that they were in the process of checking their tax and assessment records in an effort to find evidence of a ten percent loss in assessed valuation (31).

If ten percent of the total assessed valuation was lost because of land purchased for reservoir development, the Adair County school system would qualify for federal funds to compensate for their tax loss.⁶ County officials estimated the growth of the tax base would ameliorate the present loss of assessed valuation in five years. They were, however, very much concerned about the loss of assessment during the next few years because of rapidly increasing local expenditures. However, examination of the income and tax data suggest no increased tax severity because of the loss of acreage during land acquisition and construction. Both measures of capacity, base and income, increased faster from 1963 to 1967 than school expenditures for the same period. One method presently being employed by Adair County, to compensate for the loss of assessment, according to local officials, is that of increasing the rate of taxation. This was done in 1966 and 1967, and will probably be used in 1968 after another decrement occurs in the tax base.

THE EFFECT OF THE GREEN RIVER RESERVOIR ON THE PROPERTY TAX REVENUE OF TAYLOR COUNTY SCHOOLS

Taylor County has a county school district and an independent school district. The Campbellsville Independent School District has one elementary and one high school; Taylor County, also, has one elementary and one high

⁶ Public Law 874 provides for federal assistance to schools where federal activities have made an adverse impact. Under this law a school system is eligible to receive federal funds if ten percent or more of its assessed valuation is lost as a result of land purchases by the federal government which are immune to local taxation.

school. From school year 1958-59 to school year 1967-68, the Campbells-ville school enrollment decreased slightly from 1,613 to 1,560, a decrease of 3.2 percent (14). The enrollment of the Taylor County school system increased from 2,028 to 2,321 during the same period (14). For both school systems combined, enrollment increased slightly from 3,641 in 1958-59 to 3,881 in 1967-68. Enrollment and average daily attendance have fluctuated considerably in these schools over the past decade because of the number of transitory workers locating in Campbellsville and Taylor County.

In Taylor County's school system, property tax revenue increased from \$78,164.93 in 1958-59 to \$190,007.96 in 1967-68, an increase of 143 percent (14). In the same time period, per capita school taxes increased from \$10.85 to \$17.62. During the period of reservoir construction, 1963-64 to 1967-68, total school expenditures increased from \$803,383.31 to \$1,171,434.44, an increase of 45.2 percent (14). In the same period, total taxes increased from \$218,845.56 to \$296,030.88, an increase of 35.2 percent; general property taxes increased from \$127,057.24 to \$190,007.96, a 49.5 percent increase (14). The rate of increase in the property tax was much faster than the increase in all school taxes.

Annual Changes in Tax Severity

In 1963, the assessed value of property was \$11,261,457; 30.7 percent of the full value of \$36,754,000 (15, 1964). The general property taxes paid to the Taylor County system were \$121,717.05 (14). In 1964, the gross value assessment of property subject to taxation was \$13,760,192, up to 34.6 percent of the full value of \$39,784,000 (15, 1964). The amount of the general property tax in 1964 was \$127,057.24 (14). The growth in the full value of property was 8.2 percent compared to an increase of 4.4 percent in the amount of the property tax. The base elasticity coefficient is 0.54, indicating an inelastic relationship between the property tax change and the change in tax base. The personal income elasticity

coefficient was nearly the same at 0.53. These coefficients are summarized in Table 10.

By January 1, 1965, the date of assessment for property in 1965, approximately 4,054 acres of land had been purchased by the federal government and removed from the tax rolls. In 1965, the assessed value of farm land was \$5,095,965 of a total property assessment of \$12,195,043 (15, 1966). The full value of property was \$44,734,000, giving an assessment ratio of 27.3, down considerably from 34.6 in 1964. From 1964 to 1965, the gross value assessment of property increased 5.5 percent; the full value increased to \$44,734,000, an increase of 12.4 percent (14, 1966). School property taxes paid in 1965 were \$133,181.68, an increase of 4.8 percent. The coefficient of base elasticity is 0.39, indicating an inelastic relationship, and a decrease in the severity of the school property tax from the previous year.

Personal income increased from \$27,267,000 in 1964 to \$28,130,000 in 1965 an increase of 3.2 percent (30, June 10, 1966). The income elasticity coefficient is 1.50, indicating a slightly elastic relationship between the tax change and the income change.

In 1966, the full value assessment of property was \$52,334,878, an increase of 17.0 percent over the 1965 full value (15, 1966). The property tax increased from \$133,181.68 to \$184,758.38, an increase of 38.7 percent (14). The coefficient of base elasticity is 2.28, an elastic change from 1964 to 1965, indicating an increase in the severity of the property tax vis-a-vis the increase in the tax base.

Personal income increased from \$28,130,000 to \$31,686,000, from 1965 to 1966, an increase of 12.6 percent (30, June 10, 1967). The income elasticity coefficient for the change in the property tax is 3.07. Both measures of the property tax change to the measures of capacity base and income, indicate a rather large increase in the severity of the school

TABLE 10

INDICES OF TAX CAPACITY AND TAX SEVERITY
FOR TAYLOR COUNTY SCHOOL SYSTEM, 1963-1967

Year	Full Value Of Property	Personal Income	General School Property Tax	Elasticity Coefficients	
				Tax Base	Income
1963	\$ 36,754,000	\$ 25,172,000	\$121,717.05	$\frac{4.4}{8.2} = 0.54$	$\frac{4.4}{8.3} = 0.53$
1964	39,784,000	27,267,000	127,057.24	$\frac{4.8}{12.4} = 0.39$	$\frac{4.8}{3.2} = 1.50$
1965	44,734,000	28,130,000	133,181.68	$\frac{38.7}{17.0} = 2.28$	$\frac{38.7}{12.6} = 3.07$
1966	52,334,878	31,686,000	184,758.38	$\frac{2.8}{7.1} = 0.38$	$\frac{2.8}{10.6} = 0.27$
1967	56,069,902	35,036,000	190,007.96		
1963-1967				$\frac{56.2}{52.6} = 1.07$	$\frac{56.2}{39.2} = 1.43$

SOURCES: Kentucky Department of Education and
Sales Management, Inc.

property tax from 1965 to 1966 in Taylor County. It should be noted again how this large increase occurred in the first year of full value property assessment and was caused by the increase in assessment more than exceeding the decrease in tax rate.

In 1967, the full value of property subject to school taxation increased to \$56,069,902, up 7.1 percent over the previous year (16). The property tax increased by 2.8 percent, from \$184,758.38 to \$190,007.96 (14). The base elasticity coefficient for the change is 0.38, indicating a slowdown from the large tax increase of the previous year.

Personal income in 1967 was \$35,036,000, an increase of 10.6 percent over the previous year's level of \$31,686,000 (30, June 10, 1968). The income elasticity coefficient is 0.27, indicating a very inelastic change from the previous year.

By 1967, 12,081 acres of land had been removed from the tax rolls--approximately three-fourths of the total acquired. At the 1967 per acre valuation of land, \$183.46, the amount of assessed valuation lost from the tax rolls was \$2,216,380, approximately 4.0 percent of the 1967 assessment.

At the time of this study, data pertaining to 1968 assessments and taxes are not available. But, an estimate of the lost assessment and property tax can be made for the 1968-69 school year. By 1968, 16,109 acres of farm land, the total amount acquired for the reservoir, had been purchased and removed from the tax rolls. Assuming an increase in assessment of farm land equal to the 1967 rate of 1.7 percent, the amount of assessed valuation lost was \$3,006,745, about 5.0 percent of the total.

Government and school officials were not concerned about any possible loss of tax revenue, feeling that the growth of property values due to expansion of industry and population would more than off-set any short-run loss of tax revenue resulting from the reservoir. In 1962, the superintendent of Taylor County schools estimated that the loss of tax

revenue would be no more than \$10,000, after land purchases were made (31). The author estimates that the potential maximum tax levy lost in 1968 is \$16,326.62 (\$3,006,745 assessment times 0.543, the tax rate).

Period Changes in Tax Severity

From 1963 to 1967, the general property tax increased by 56.2 percent in the Taylor County School system. This increase in taxes was much larger than the increase for the state during the same period which was 43.1 percent. Relative to the tax base and personal income the growth of the school tax was also larger. The tax base coefficient for the 1963-67 period is 1.07--slightly elastic. From 1963 to 1967, personal income increased by 39.2 percent yielding an income coefficient of 1.43--elastic for the period of reservoir development. However, the fact that most of the rise in taxes came in the first year of full value assessment indicates that the change in assessment method may have been more significant than the reservoir in causing this elasticity.

COMPARISON OF THE SEVERITY OF COUNTY AND SCHOOL TAXES IN ADAIR AND TAYLOR COUNTIES WITH THE STATE AVERAGES

The increases in county property taxes in Adair and Taylor Counties --county taxes remained almost constant in Taylor County--from 1963 to 1967, the period of reservoir construction, were extremely minuscule compared to increases for the state. These small increases in county taxes vis-a-vis tax base and income yield inelastic indices of tax severity for Adair and Taylor Counties. In Kentucky, the tax base elasticity coefficient for taxes in all counties is 3.05, for the period 1963 to 1967. This coefficient is very elastic indicating a growth in taxes approximately three times greater than the growth in base. For the same period, the income elasticity coefficient for all counties is 1.80 also elastic. These coefficients are shown in Table 11.

TABLE 11

COMPARISON OF TAX SEVERITY INDICES IN
 ADAIR AND TAYLOR COUNTY GOVERNMENTS,
 ADAIR AND TAYLOR COUNTY SCHOOL SYSTEMS
 WITH TAX SEVERITY INDICES OF KENTUCKY
 COUNTIES AND SCHOOLS, 1963-1967.

Taxing Jurisdiction	Base Elasticity Coefficients	Income Elasticity Coefficients
Adair County	0.34	0.35
Taylor County	0.00	0.00
All Counties in Kentucky	3.05	1.80
Adair County Schools	0.77	0.76
Taylor County Schools	1.07	1.43
All Schools in Kentucky	1.80	1.02

SOURCES: Kentucky Department of Education, Kentucky Department of
 of Revenue, and Sales Management, Inc.

The coefficients of elasticity for income and tax base in the Adair and Taylor County School systems are much larger than those for county taxes. Both elasticity coefficients, tax and income, are, however, inelastic for the Adair County system. For the state as a whole, both measures are elastic-- 1.80 for tax base and 1.02 for personal income. In the Taylor County School system, both measures are elastic, but only the income elasticity coefficient of 1.43 is larger than the state average. These elasticity coefficients indicate that over-all the rate of change in severity of taxes in Adair and Taylor Counties is much less than for the state as whole.

THE EFFECT OF THE GREEN RIVER RESERVOIR ON LOCAL EXPENDITURES

Of the six counties investigated in this study, Taylor County was the only one within which a large group of reservoir construction workers elected to locate. The purpose of this section is to examine the resulting effect on government and school expenditures in Taylor County. The expenditure effects are determined through discussion with local government and school officials in Taylor County, and county and school budgets.

The Taylor County government provided a package of services (expenditures) to approximately 16,800 people from 1963 to 1967. Very little change in total population occurred during this period even though a fairly substantial number of temporary workers including the 150 on the reservoir, moved in and out. The two broad categories of spending for county governments are general fund expenditures and road fund expenditures. Approximately sixty-five percent of total expenditures were general fund and about thirty-five were road fund expenditures in Taylor County from 1963 to 1967 (12). The road fund expenditures fluctuate more because they are sometimes bunched in years when new equipment is required. This need cannot be tied to the presence of the construction workers.

From 1963 to 1967, general fund expenditures in Taylor County increased from \$97,006.06 to \$130,664.00, an increase of 34.7 percent, less than 7.0 percent increase per year (12). The general fund expenditures increased from \$5.71 per capita to \$7.69 per capita. Examination of the financial records and discussion with local officials in Taylor County indicate that the increase in county expenditures was a result of rising prices and wages. The quality or quantity of county services did not ostensibly increase during the period of study. Most general fund expenditures are for salaries paid to local government officials. These salaries have been extremely low, but the primary reason for the large increase in county expenditures, 69.4 percent in the 1963-67 period, is the necessity of making sizeable increases in the salaries paid local government officials. For example, during the period of study, 1963 to 1967, the following salary increases were made in Taylor County: county attorney from \$2,400 to \$4,500; county judge from \$3,120 to \$4,050; tax commissioner from \$1,300 to \$1,800; county auditor from \$250.00 to \$500.00 (12). These are a few examples cited to explain the 34.7 percent increase in general fund expenditures. Examination of budget data and discussion with local officials indicate that no increase in county expenditures could be causally related to reservoir construction nor were the county government officials required to spend any significant amount of time providing services to the construction workers (31). At the most, there were only 150 reservoir workers located in Taylor County at a given time. Even allowing for families, the county population of 17,000 was temporarily increased by only two or three percent.

Short-term increases in population may increase certain school expenditures. The various categories of current school expenditures are administration, instruction, attendance and health services, pupil transportation, operation of plant, maintenance of plant, and fixed charges.

The largest expenditure category, and the one most sensitive to an increase in enrollment (providing temporary classroom space can be made available), is instruction. In Taylor County, from 1963 to 1967, instructional costs were approximately seventy-five percent of total current expenditures. Because of the rapid increase in instructional costs during the study period, the cost of additional pupils cannot be ascertained from budget data. The increment to instructional costs caused by the increase in enrollment is obtained from estimates by school officials in Taylor County.

The Taylor County School superintendent estimated that an average of 65 to 70 additional students were enrolled each year in the school system because of reservoir construction workers locating in Taylor County. (A precise estimate of the increase could not be made because construction of a pipeline in Taylor County coincided with construction of the reservoir.) The additional students necessitated two additional classroom units.⁷ The additional students increased instructional expenses by two units, but did not increase other school costs. The instructional costs per classroom unit in the 1964-65 school year--the first school year after reservoir construction began--was approximately \$5,000, making a total cost for two classroom units \$10,000 (14). In 1965-66, the instructional cost for two classroom units was \$11,200; for 1966-67, the instructional cost was \$12,000; and 1967-68, the additional classroom cost was approximately \$15,000 (14). The total additional school cost resulting from the increased enrollment for the four school years during reservoir construction was approximately \$48,800. By the beginning of the 1968-69 school year, most of the construction work was completed and the workers had left the area.

⁷ The maximum number of students allowed per classroom is thirty-five, under regulations of the Minimum Foundation program. When student enrollment increases by thirty to thirty-five students, an additional classroom is generally needed. Room for the additional classes in the Taylor County School was made available in the existing facilities.

The tax revenue of the Campbellsville Independent School District, in the county seat of Taylor County, was not affected by land acquisition for reservoir development. However, the school had a small increase in expenditures during the period of reservoir construction as some workers and their families located in Campbellsville. School officials estimated that an average of about thirty students were added to their enrollment during the school years 1964-65 through 1967-68 (31). This enrollment increase necessitated an additional classroom unit in each of these years; but other school expenses were not increased because additional students could be absorbed by excess capacity available in existing facilities. The expenditures per classroom unit during this period were approximately as follows:

1964-65 -	\$5,400;
1965-66 -	\$5,900;
1966-67 -	\$6,700; and
1967-68 -	\$7,300 (14).

The total increase in instructional cost during the reservoir construction period was approximately \$25,300. Workers had gone from the area by the 1968-69 school year, terminating the additional instructional cost. It should be noted that the increases in expenditure for both districts is of the same order of magnitude as the annual fluctuations in general school property tax shown on Table 10.

SUMMARY AND CONCLUDING REMARKS

The Green River Reservoir is located in Adair and Taylor Counties; two counties that differ considerably in their economic characteristics. Both counties are mainly agricultural, but Adair is much more dependent on agriculture as its primary source of income. Taylor County had comparatively more non-agriculture type industries. This difference is

reflected in the level of personal income per capita in the two counties. In 1967, the per capita income in Adair County was \$1,460; in Taylor County the per capita income was \$2,086. In the same year, retail sales in Taylor County were approximately double those in Adair County.

Adair County is much larger than Taylor County-- 251,520 acres in Adair County to 181,760 in Taylor County. In 1963, prior to the acquisition of land by the federal government for the Green River Reservoir, there were 194,481 acres of farm land in Adair County, and 159,102 acres of farm land in Taylor County. Virtually, the same number of acres of land were acquired in the two counties--16,417 acres in Adair County and 16,109 acres in Taylor County. The acreage lost from the tax rolls represents 8.4 percent of the farm land in Adair County, and 10.4 percent of the farm land in Taylor County.

As is true for most agricultural areas, the population of Adair County has continually decreased since its peak in 1940. The population decrease in the county accelerated during the 1960's due to diminishing agricultural opportunities and a dearth of industrial jobs, coupled with the displacement of people by the reservoir. Taylor County experienced a slight increase in population during the 1960's. This is largely attributable to a number of new industries locating in the county creating more than 2,000 new jobs.

The acquisition of land in Adair and Taylor Counties for the Green River Reservoir occurred over a period of four years, 1964 through 1967. As hypothesized in Chapter II, the loss of land from the tax rolls did not seem to impair the ability of the county governments and county school districts to finance their expenditures during land acquisition and reservoir development. The base and income coefficients of elasticity indicate that the loss of farm land in Adair County, did not adversely effect the severity of the property tax for either the county government or the county school districts. This was also the case for the Taylor County government.

In the Taylor County School system (the only case where an increase in expenditure was noted), the severity of the property tax did increase slightly relative to the measures of capacity. Except for the Taylor County schools, most of the annual changes in the elasticity coefficients are inelastic. Coefficients computed for the entire period, 1963 to 1967, show that the severity of the property tax diminished in Adair County, Adair County School System, and Taylor County government. Comparison of these elasticity coefficients with the state average show that over-all property taxpayers in Adair and Taylor Counties experienced smaller increases in tax severity than did the average taxpayer in the state.

CHAPTER V

THE BARKLEY LAKE RESERVOIR

The fifth chapter, the last of three case studies concerning the financial impact of reservoir development on county governments and school districts, is a case study of the effect of Lake Barkley in Lyon and Trigg Counties in western Kentucky. The Barkley Dam inundates the largest acreage of the three reservoirs studied. The Project was named by the Congress of the United States in honor of the Senator and Vice-President from Kentucky, Alben W. Barkley. The dam is located on the Cumberland River in the northwest section of Lyon County on Highway 62 (Figure 7). The Barkley Project was authorized by the River and Harbor Act of 1954, and project construction spanned the decade from 1957 to 1966. The Barkley Dam provides flood control, navigation, power, water supply, and recreation benefits.

A BRIEF DESCRIPTION OF LYON AND TRIGG COUNTIES

Lyon County is located in the western section of Kentucky. It is bounded on the south by Trigg County, on the north by Crittenden and Livingston, on the west by Marshall, and on the east by Caldwell County. Trigg County is contiguous to the southern border of Lyon County. It is bounded on the south by the Tennessee border, by Calloway and Marshall on the west, and by Christian on the east.

The population of both Lyon and Trigg Counties has been almost continuously declining since reaching peak values in 1910 (Appendix B). In 1967, the population of Lyon County was estimated at 5,500, and the population of Trigg County was estimated at 8,800 (30, June 10, 1968). The large decline in population (down from 9,423 and 14,539 respectively) can be attributed to the diminishing number of agricultural jobs and the large amount of privately

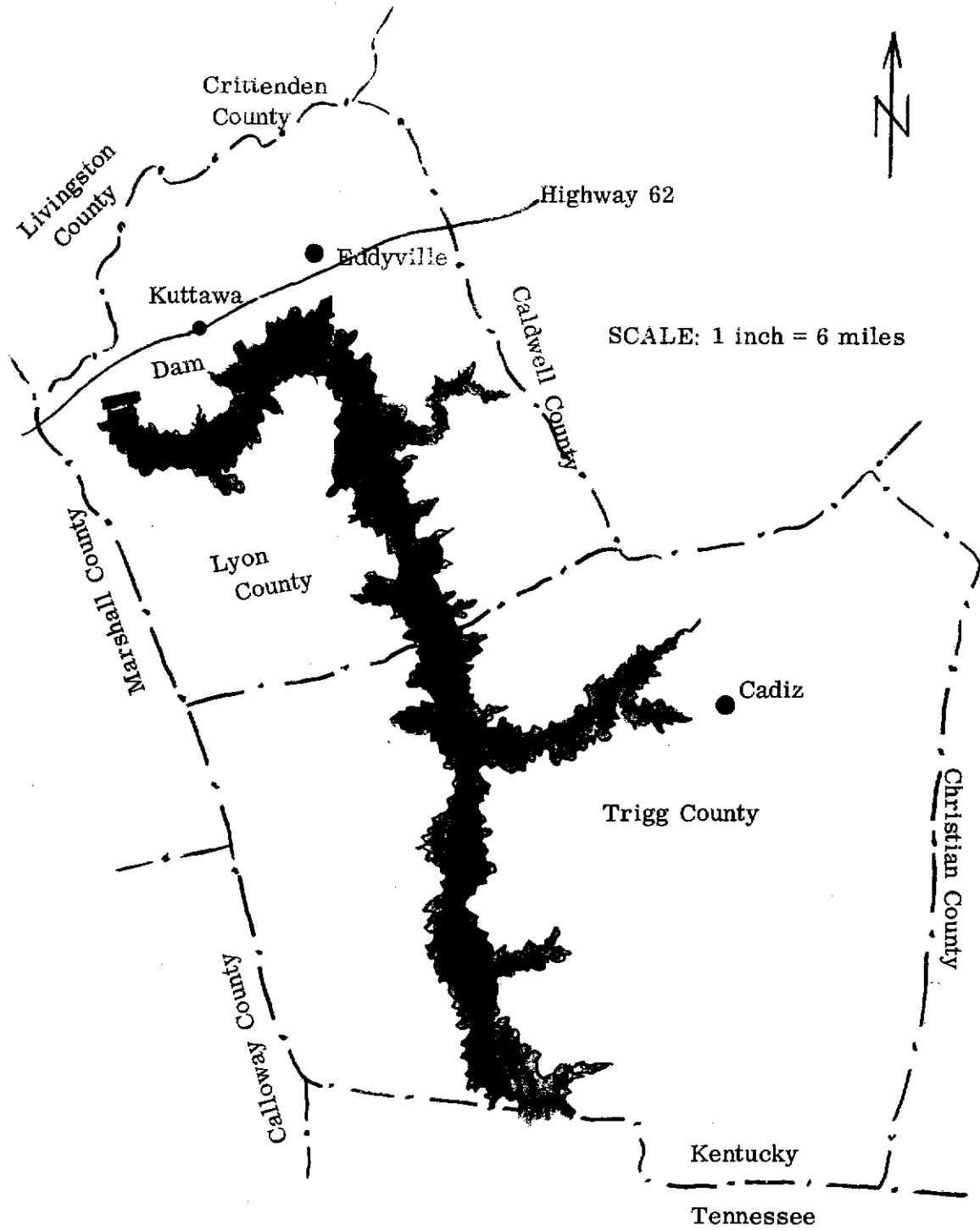


FIGURE 7: The Location of the Barkley Reservoir

owned land absorbed by various federal projects.

The primary industry and largest employer in Lyon County is agriculture. The total acreage in Lyon County is 161,900 (18). In 1959, there were 90,839 acres of land being used for farming; by 1964 the amount of farm land was down to 62,756 acres, a decrease of 31.2 percent (19). The average value per acre of farm land increased from \$88.13 in 1959 to \$128.24 in 1964, an increase of 45.5 percent (19).

Like Lyon County, Trigg County is also primarily agricultural. The county contains a total of 293,760 acres of land; of the total, 167,590 acres were in farms in 1959 (18). By 1964, the farm acreage had decreased to 144,347, a decrease of 13.9 percent (19). The average value of farm land increased from \$70.27 per acre in 1959 to \$146.70 in 1964, an increase of 108.7 percent (19).

The Corps of Engineers acquired 31,578 acres of land in Lyon County for the Barkley Reservoir; this amount represents 19.5 percent of the total land area and 34.8 percent of the 1959 farm acreage. The Corps of Engineers paid \$8,908,872, an average price of \$282.12 per acre (27). During the past three decades Lyon County also lost 6,700 acres of land to Kentucky Lake (built by the Tennessee Valley Authority along the Tennessee River on the western border of the county) and 34,056 acres to the United States Wildlife Service for a wildlife refuge (located between the lakes). In all, the county has lost 72,324 acres, at 44.7 percent of the county area, from its tax rolls (24).

The Corps of Engineers purchased 27,880 acres of land in Trigg County for the Barkley Project, this amount represents 9.5 percent of the total land in the county and 16.6 percent of the 1959 farm acreage. The Corps of Engineers paid a total of \$5,598,447, an average price of \$164.94 per acre (27). Prior to the purchase of land for the Barkley Project, Trigg County had already lost much of its land to other federal projects during the preceding

three decades. The county lost approximately 11,700 acres, 4.0 percent of its total area, to Kentucky Lake; about 23,000 acres, 8.0 percent to Fort Campbell (located in the southeastern corner of the county); another 11,700 acres, 4.0 percent for use by Fort Campbell forces; and approximately 35,000 acres, 12.0 percent, to the United States Wildlife Service for the wildlife refuge. Almost 38.0 percent of the total original land in the county has been lost from the tax rolls (25).

As Lyon County is primarily rural and heavily dependent upon agriculture as its main source of income, it has a relatively low level of income although income increased comparatively rapidly during the Sixties. From 1957 through 1966--the decade encompassing the development of the Barkley Project--personal income increased from \$4,945,000 to \$10,660,000 (Table 12), an increase of 115.6 percent (30). During the same period, per capita income increased from \$761 to \$1,938, an increase of 154.7 percent (30). The biggest single increase in personal income, during this period, came in 1961. This large increase can be partially explained by the exodus of many older people, with low incomes, from the county as a result of selling their property to the Corps of Engineers and being unable to find immediate housing in the county. The pattern seemed to be that the older, retired people left the county and younger workers moved into the area to construct private and public facilities in the relocated towns.

Personal income and per capita income grew at a slower rate in Trigg County from 1957 to 1966 than in Lyon County. Personal income grew from \$7,499,000 in 1957 to \$11,946,000 in 1966 (Table 13), an increase of 59.3 percent (30). Per capita income grew from \$852 to \$1,358 an increase of 59.4 percent, during the same period (30). Personal income and per capita income grew at the same rate due to the static population in Trigg County during this ten year period. Income in Trigg County increased at a fairly consistent rate over this period. There were no abrupt changes from year to year as in Lyon County.

THE EFFECT OF THE BARKLEY RESERVOIR ON LYON COUNTY PROPERTY TAXES

It is the purpose of this section to analyze the effect of the Barkley Reservoir on property taxes in Lyon County resulting from the purchase and removal of land from the tax rolls for the Barkley project. This analysis proceeds in terms of annual changes in real estate taxes vis-a-vis annual changes in personal income and full value of taxable property in the county. These ratios are expressed in terms of elasticity coefficients summarized on Table 12. The study period from 1957 through 1966 covers all phases of land acquisition and construction. Land acquisition covered the six-year period from 1959 to 1965. The purchase of land was distributed almost evenly over each of these six years. The loss of land from the tax rolls diminished the physical size, number of acres, of the tax base from 1960 through succeeding years until 1966.

Revenue Effects

In 1957, the full value of property in Lyon County was \$13,560,000, and increased to \$15,581,000 in 1958, an increase of 14.9 percent (14). From 1957 to 1958, personal income increased from \$4,945,000 to \$5,186,000, an increase of 4.9 percent (30, June 10, 1959). The real estate property tax levy was \$11,917.48 in 1957, and \$12,496.14 in 1958, an increase of 4.9 percent (12). The tax rate per \$100 of assessed valuation was .50 during the entire period studied until 1966, when full assessment became mandatory and the Lyon County tax rate was lowered to .091 (16). From 1957 to 1958, the assessment of real estate increased, also, by 4.9 percent. The tax base elasticity coefficient for the 1957-58 change is 0.33. Relative to the increase in value of the tax base, the severity of the property tax diminished. The income elasticity coefficient for the same annual change is unitary, 1.0, indicating an equal change in property tax

TABLE 12

INDICES OF TAX CAPACITY AND TAX SEVERITY
FOR LYON COUNTY GOVERNMENT, 1957-1966

Year	Full Value Of Property	Personal Income	Real Estate Tax Levy	Elasticity Coefficients	
				Tax Base	Income
1957	\$13,560,000	\$ 4,945,000	\$11,917.48	$\frac{4.9}{14.9} = 0.33$	$\frac{4.9}{4.9} = 1.0$
1958	15,581,000	5,186,000	12,496.14	$\frac{-3.4}{-3.3} = 0.12$	$\frac{-3.4}{6.1} = -0.07$
1959	15,060,000	5,500,000	12,444.92	$\frac{-12.9}{1.3} = -9.9$	$\frac{-12.9}{-8.3} = 1.55$
1960	15,259,000	5,045,000	10,834.97	$\frac{2.0}{8.6} = 0.24$	$\frac{2.0}{70.5} = 0.03$
1961	16,574,000	8,602,000	11,048.42	$\frac{9.8}{12.2} = 0.80$	$\frac{9.8}{3.9} = 2.51$
1962	18,603,000	8,944,000	12,136.58	$\frac{10.3}{12.6} = 0.82$	$\frac{10.3}{5.4} = 1.91$
1963	20,965,000	9,395,000	13,386.61	$\frac{14.2}{16.8} = 0.84$	$\frac{14.2}{3.4} = 4.18$
1964	25,200,000	9,716,000	15,286.68	$\frac{1.2}{1.8} = 0.66$	$\frac{1.2}{-2.8} = -0.43$
1965	25,664,000	9,472,000	15,468.56	$\frac{45.7}{28.9} = 1.58$	$\frac{45.7}{9.7} = 4.71$
1966	33,097,468	10,660,000	22,536.89		
1959-1965				$\frac{24.3}{72.2} = 0.34$	$\frac{24.3}{70.4} = 0.34$
1957-1966				$\frac{89.1}{144.1} = 0.62$	$\frac{89.1}{115.6} = 0.77$

SOURCES: Auditor of Public Accounts, Kentucky Department of Education and Sales Management, Inc.

relative to the change in personal income. Table 12 reveals all the income elasticity coefficients before 1961 to be inelastic (that for the change from 1959 to 1960 is inelastic because of the negative denominator) while all those after 1961 are elastic. These latter years exhibit a much slower rate of increasing income and a faster rate of increasing taxes.

Inspection of the tax changes relative to the changes in the full value of property as shown for the remaining years of the study on Table 12 shows that only in the change from 1965 to 1966 (the year of conversion from partial to full assessment) is the elasticity coefficient of the tax base elastic. In the other years the elasticity coefficient is inelastic. From 1959 to 1960, the property tax went down while the full value of property increased. The tax base coefficient computed for the entire period--1957 to 1966-- shows that the change in property taxes relative to the change in tax base is 0.62-- inelastic. Even more inelastic is the tax base coefficient for the period of land acquisition, 1959 to 1965, which is 0.34.

Over the period of development of the Barkley Project the increase in income was larger than the increase in property taxes in Lyon County. The elasticity coefficient of personal income for the change from 1957 to 1966 is 0.77, indicating an inelastic response of property taxes to personal income for the ten year period. From 1959 to 1965, the period of land acquisition, the growth in income was even larger vis-a-vis property taxes than for the entire period studied. This is evidenced by an income coefficient of 0.34.

In 1960, it was estimated by an engineering consultant that the Lyon County government would suffer an annual loss of \$2,156.83; and that it would take until 1970--four years after the project was completed--for tax revenue to return to the 1959 level, the year land acquisition began (24). The figures on Table 12 exhibit a much quicker recovery.

Town Relocations

In Lyon County it was necessary to relocate most of Eddyville and Kuttawa, two small towns partially inundated by the reservoir, a few miles from their old sites. The federal government paid the cost of relocating the streets, buildings, and utilities on a replacement basis. Most people, according to county and municipal officials, affected by this move were pleased because the new locations permitted planning of the towns to expedite orderly and systematic growth while the location and terrain of the old towns served limited further growth. In addition, the people who sold their houses in the old towns could, and did, use the money to build more modern houses in the new towns.

From the viewpoint of effects on revenue and expenditure, new buildings are assessed at higher values than the old and thus provide additional tax revenue (31). Maintenance expenditures would be lower for the new public facilities.

It was estimated before the relocation that the land acquisition in Old Eddyville--the new town is called New Eddyville--would result in annual loss of \$1,454.20 in city taxes, \$867.94 in county taxes, and \$2,607.40 in school taxes (24). For the loss of land in Old Kuttawa, it was estimated that the annual loss in tax revenue would be \$1,478.25 in city taxes, \$806.85 in county taxes, and \$2,446.99 in school taxes (24). Afterwards, municipal officials stated unequivocally that their financial position was much better in the new towns than the old (31). The better financial position was attributed to new properties which are more valuable and, hence, are assessed at larger amounts than the old properties. Also, the population of the new towns contained more people with industrial jobs and higher incomes. The new town sites have greater potential for growth--population and economic.

Expenditure Effects

There were no increases in county expenditures resulting from development of the Barkley Project. Construction workers preferred to live in the larger cities of Central City, Hopkinsville, and Paducah (31). Also, there were no municipal expenditure increases associated directly with the relocation of the towns. The municipalities built certain facilities larger than needed by the present population (e. g. , the water plant), but these expenditures were made in anticipation of future growth rather than to serve existing needs. About seven miles of county roads were relocated in Lyon County at the expense of the Corps of Engineers while about eighteen miles were abandoned. The relocated road system was far superior to that existing prior to the impoundment. The net effect on county road expenditure was small because of the low mileage involved, but fewer and better roads tend to decrease maintenance and improvement costs.

THE EFFECT OF THE BARKLEY RESERVOIR ON TRIGG COUNTY PROPERTY TAXES

This section analyzes the effect of the Barkley Project on property taxes in Trigg County--a county to the south of Lyon County that lost 27, 880 acres from the tax rolls to the Barkley Reservoir. The change in income and tax base variables are examined relative to the change in the property tax levy. These relationships are summarized in Table 13. The total period covered is from 1957 to 1966 -- the period encompassing development of the Barkley project. Land acquisition occurred during the period from 1959 to 1965, diminishing the physical size, in terms of acreage, of the tax base every year from 1960 through 1966.

The change in the tax and income variables from 1957 to 1958, represents the last change unaffected by land acquisition. From 1957 to 1958, the full value of taxable property in Trigg County increased from \$22, 316, 000 to \$24, 278, 000, an increase of 8.9 percent (15). The property tax levy

TABLE 13
 INDICES OF TAX CAPACITY AND TAX SEVERITY
 FOR TRIGG COUNTY GOVERNMENT, 1957-1966.

Year	Full Value Of Property	Personal Income	Real Estate Tax Levy	Elasticity Coefficients	
				Tax Base	Income
1957	\$22,316,000	\$7,499,000	\$27,408.83	$\frac{1.6}{8.9} = 0.18$	$\frac{1.6}{5.9} = 0.27$
1958	24,278,000	7,944,000	27,849.00	$\frac{3.2}{6.9} = 0.47$	$\frac{3.2}{9.1} = 0.35$
1959	25,965,000	8,668,000	28,741.93	$\frac{25.5}{-13.4} = -1.90$	$\frac{25.5}{3.1} = 8.23$
1960	22,496,000	8,938,000	36,069.55	$\frac{-3.9}{8.5} = -0.46$	$\frac{-3.9}{-7.3} = 0.53$
1961	24,411,000	8,288,000	34,672.77	$\frac{-8}{7.9} = -0.10$	$\frac{-8}{5.6} = -0.14$
1962	26,339,000	8,756,000	34,375.10	$\frac{3.1}{10.7} = 0.29$	$\frac{3.1}{6.7} = 0.45$
1963	29,165,000	9,345,000	35,436.90	$\frac{3.2}{12.5} = 0.26$	$\frac{3.2}{8.5} = 0.38$
1964	32,824,000	10,142,000	36,554.95	$\frac{2.9}{13.2} = 0.22$	$\frac{2.9}{3.7} = 0.78$
1965	37,162,000	10,513,000	37,614.20	$\frac{13.6}{34.4} = 0.39$	$\frac{13.6}{13.7} = 0.99$
1966	49,958,796	11,946,000	42,719.64		
1959-1965				$\frac{30.5}{43.1} = 0.71$	$\frac{30.5}{21.3} = 1.43$
1957-1966				$\frac{55.9}{123.9} = 0.45$	$\frac{55.9}{59.3} = 0.94$

SOURCES: Auditor of Public Accounts, Kentucky Department of Revenue, and Sales Management, Inc.

increased from \$27,408.83 to \$27,849,000, an increase of 1.6 percent (12). The tax rate per \$100 of assessed valuation was .50 during the period studied until 1966, when full assessment was mandatory and tax rates were adjusted downward to a rate of .104 per \$100 of assessed valuation (12). The tax base elasticity coefficient for the 1957-58 change was 0.18--very inelastic. In subsequent years, the only annual change in which the base coefficient denotes an increase in tax severity is the 1959-60 change. From 1959 to 1960, the property tax increased by 25.5 percent (over half the increase for the total period) while the full value of taxable property declined by 13.4 percent. The reason for this increase is discussed later in connection with the Trigg County Schools. The coefficient of base elasticity computed for the entire period from 1957 to 1966 is 0.45, inelastic, indicating that the growth in property taxes was less than one-half the growth in the tax base. During land acquisition the tax base coefficient is slightly larger--0.71, but still inelastic. The period of land acquisition excludes the year 1966 when full value assessment of property began and large assessment increases by local governments were not uncommon.

Examination of the changes in taxes relative to the changes in personal income evince almost the same pattern of changes as the tax base. All the coefficients are inelastic except the change from 1959 to 1960 when the tax levy rose sharply, change in the following year, when personal income dropped. From 1957 to 1966, the growth in taxes was almost as large as the increase in personal income. The coefficient computed for the entire period is 0.94--slightly inelastic. The severity of the property tax in Trigg County did not increase from 1957 to 1966 in terms of personal income. However, the income elasticity coefficient for the period of land acquisition, 1959 to 1965, is elastic--1.43. This is largely explainable by the recession of 1960-61 which reduced personal income in Trigg County by 7.3 percent in 1961. (In Lyon County the economic activity caused by construction caused a large increase in personal income during the time of recession in most of the state and nation.)

It was estimated by a consulting engineer in 1960, that Trigg County would lose \$217,921.60 of assessment from the tax rolls by the time land acquisition for Barkley Reservoir was completed (25). This loss of assessment taxed at .50 per \$100 of assessed valuation would, according to the estimate, mean an annual tax loss of \$1,089.61 for the Trigg County government. However, growth in the tax base was such that there is no evidence to support an increase in tax severity associated with the loss of assessment.

A small amount of property was acquired for the reservoir within the city limits of Cadiz, the county seat of Trigg County. The loss in assessment was estimated at \$75,004.00 and the annual tax loss for the city was placed at \$562.53; the annual estimated loss for the county government at \$311.48; and the annual loss of school taxes was estimated at \$1,248.49 (25). These minuscule amounts did not, according to municipal government officials, have any effect on their revenue and expenditures (31).

No expenditures in Trigg County or Cadiz were associated with development of the Barkley Project.

THE EFFECT OF THE BARKLEY RESERVOIR ON THE LYON COUNTY SCHOOL SYSTEM

Lyon County has a consolidated school system consisting of one high school and two elementary schools. Because of the location of the old high school in the reservoir area a new high school and a new elementary school were built contiguous to New Eddyville.¹ The population decrease in Lyon

¹ A new elementary school was built because it was located adjacent to the new high school to reduce transportation costs. The poor condition and facilities in the old school necessitated construction of a new building (31).

County has resulted in a decrease in enrollment in the school system. From school year 1957-58 to school year 1966-67, the school enrollment declined from 1,134 to 918, a decrease of 19.0 percent during the ten year period. During the same period, average daily attendance declined by 15.3 percent, from 1,003.1 to 850.9 (14).

During the ten year period, 1957-1966, total expenditures in the Lyon County School system increased from \$277,629.24 to \$471,931.77, an increase of 69.9 percent (14). During the same period, total receipts increased from \$242,416.54 to \$492,812.28, an increase of 103.3 percent (14). The amount of revenue provided by the general property tax increased from \$41,772.58 in 1957 to \$90,311.61 in 1966, an increase of 116.2 percent (14). The increase in the general property tax in Lyon County was almost double the increase in the general property tax for the state which increased by 60.9 percent from 1957 to 1966 (15).

From 1957 to 1958, the full value of property increased from \$13,560,000 to \$15,581,000, an increase of 14.9 percent (15, 1962). The general property tax increased by 6.8 percent, from \$41,772.55, to \$44,618.11 (12). The coefficient of tax base elasticity for the 1957-58 change is 0.46-- inelastic. For the same year, personal income increased by 4.9 percent, from \$4,945,000 to \$5,186,000 (30, June 10, 1959). The income elasticity coefficient for this change is elastic--1.39. The elasticity coefficients are summarized in Table 14. Relative to the increase in income, the severity of the general property tax increased from 1957 to 1958.

From 1957 to 1966, the severity of the property tax diminished relative to the annual increases in the tax base in each year except for the change from 1962 to 1963. From 1962 to 1963, the tax base elasticity coefficient is 4.67, denoting a large increase in severity of the tax associated with an increase in the tax rate from 1.50 to 2.00 per \$100 of assessed valuation (15, 1964). However, over the entire period, 1957 to 1966, the increase

TABLE 14
 INDICES OF TAX CAPACITY AND TAX SEVERITY
 FOR THE LYON COUNTY SCHOOL SYSTEM, 1957-1966.

Year	Full Value Of Property	Personal Income	General Property Tax Levy	Elasticity Coefficients	
				Tax Base	Income
1957	\$13,560,000	\$ 4,945,000	\$ 41,772.55	$\frac{6.3}{14.9} = 0.46$	$\frac{6.8}{4.9} = 1.39$
1958	15,581,000	5,186,000	44,618.11	$\frac{-5.1}{-3.3} = 1.55$	$\frac{-5.1}{6.1} = -0.84$
1959	15,060,000	5,500,000	42,351.44	$\frac{-8.0}{1.3} = -0.61$	$\frac{-8.0}{-8.3} = 0.96$
1960	15,259,000	5,045,000	38,956.08	$\frac{2.9}{8.6} = 0.34$	$\frac{2.9}{70.5} = 0.04$
1961	16,574,000	8,602,000	40,074.60	$\frac{6.2}{12.2} = 0.51$	$\frac{6.2}{3.9} = 1.59$
1962	18,603,000	8,944,000	42,571.55	$\frac{58.9}{12.6} = 4.67$	$\frac{58.9}{5.4} = 10.91$
1963	20,965,000	9,395,000	67,631.91	$\frac{12.2}{16.8} = 0.73$	$\frac{12.2}{3.4} = 3.59$
1964	25,200,000	9,716,000	75,911.65	$\frac{-1.9}{1.8} = -1.06$	$\frac{-1.9}{-2.8} = 0.69$
1965	25,664,000	9,472,000	74,473.11	$\frac{21.3}{28.9} = 0.74$	$\frac{21.3}{9.7} = 2.19$
1966					
1959-1965				$\frac{75.8}{70.4} = 1.08$	$\frac{75.8}{72.2} = 1.05$
1957-1966				$\frac{116.2}{144.1} = 0.81$	$\frac{116.2}{115.6} = 1.01$

SOURCES: Kentucky Department of Education and Sales Management, Inc.

in the general property tax was less than the increase in tax base. The coefficient for the change is 0.81--inelastic. At the end of the period of study the data show that the burden of the general property tax was mitigated by the increase in tax base. The largest annual increase in tax base did not occur, however, until 1966, following the end of land purchases in 1965. The tax base coefficient for the period change from 1959 to 1965 is 1.08, nearly unitary, indicating nearly equal growth in tax base and property tax. Consequently, over these six years as a whole the increase in tax rate in 1963 was almost compensated for by a gradually declining assessment ratio.

The income elasticity coefficients show the annual changes in the property tax and in personal income to be about equally distributed between inelastic and elastic values. The income elasticity coefficient computed for the entire period, 1957 to 1966, of 1.01 shows that the severity of the tax held almost constant. From 1959 to 1965, the period of land acquisition, the income elasticity coefficient is essentially the same as that for the whole period--1.05, denoting nearly equal increases in income and taxes.

The loss of assessment from the tax rolls, because of the Barkley project, was mitigated by revenue received under Public Law 874. (Public Law 874 provides funds for school districts where federal activities have caused a loss of tax assessment of 10 percent or more.) Lyon County began to receive revenue under Public Law 874 in 1959 (Table 15). These funds are still being paid at the present time (1968). In 1961 the Lyon County School system received its largest annual amount of \$43,594.17; in 1964, its smallest amount of \$6,851.00. It was between these two years (1963) when taxes were raised. The average received from 1957 to 1966, was \$20,933.00.² The

²The amount P. L. 874 funds received by a school district during a given year depends on the amount appropriated by Congress in that year for the total program and the number and student enrollment in the districts throughout the country receiving these funds.

funds received under Public Law 874 made it possible to hold property taxes at about constant severity throughout the period. If the amount of additional revenue received under Public Law 874 had been raised from property taxes, the increase in the burden of the tax would have been quite severe (1959-1965 coefficients would have been increased from about 1.1 to 1.7). However, the severity of the general property tax did not increase because of the growth in the tax base and the receipt of federal funds.

THE EFFECT OF THE BARKLEY RESERVOIR ON THE TRIGG COUNTY SCHOOL SYSTEM

Trigg County has a consolidated school system consisting of one high school and one elementary school. Hence, the tax and the personal income base figures are the same as those for the county government. The enrollment in Trigg County decreased slightly from 1957 to 1966. In 1957, the enrollment was 2,064; by 1966, the enrollment decreased to 1,973, a decrease of 4.4 percent. During the same period, average daily attendance declined by only 0.8 percent, from 1,853.8 to 1,839.0 (14).

During the period of investigation, 1957 to 1966, school expenditures in Trigg County increased from \$512,446.45 to \$605,492.66, an increase of 18.2 percent (14). At the same time, revenue receipts increased by 123.7 percent, from \$455,150.55 to \$1,017,963.20 (14). During this ten year period, property taxes increased from \$123,863.20 to \$200,828.48, an increase of 62.1 percent (14). The increase in property taxes of 62.1 percent is almost equal to the increase in Kentucky for the same period--60.9 percent.

From 1957 to 1966, the full value of property grew very rapidly, increasing from \$22,316,000 in 1957 to \$49,958,769 in 1966, an increase of 123.9 percent (15). The growth in the general property tax was only one-half this

amount (62.1 percent). These values yield a tax base coefficient of 0.50--inelastic. Relative to the full value of the tax base, the general property tax diminished in severity following reservoir completion compared to the period preceding land acquisition for the reservoir. For all the annual changes, except the 1959 to 1960 change, the tax base coefficients were inelastic, indicating a decrease in the severity of the tax for all years except one (Table 15). From 1959 to 1960, the full value of property decreased as the first increment of real estate was lost from the tax rolls. This loss came at a time when the general property tax increased by 26.4 percent. These opposite movements, in tax base and property tax, yield a perverse elasticity coefficient of -1.97. From 1960, to the end of the period studied, 1966, the full value of property increased much more every year than did the tax levy causing the elasticity coefficients to be very inelastic.

Personal income in Trigg County from 1957 through 1966 increased by 59.3 percent. This increase is smaller than the increase in personal income for the state of 66.5 percent during the same time period (30). The slow growth in income, slower than the increase in the property tax, resulting in a slight increase in the severity of the general property tax as indexed by the income coefficient from 1957 to 1966. The coefficient for the 1957 to 1966 change is 1.05, indicating a very small increase in tax severity for the ten year period. Most of the annual changes were, however, inelastic except the change from 1959 to 1960. (The change in the following year is elastic by virtue of the negative denominator.) The increase in the general property tax, 26.4 percent, was so unusually large that the annual change from 1959 to 1960, yields a coefficient of 8.52--very elastic.

The data on Table 16 exhibit a time trend which seems to be typical of property tax revenues collected by small local governments allowed to freely vary their assessment ratio. Assessments and taxes collected remain fairly stable for a period of years while the full value of taxable property is increasing.

TABLE 15

INDICES OF TAX CAPACITY AND TAX SEVERITY
FOR THE TRIGG COUNTY SCHOOL SYSTEM, 1957-1966

Year	Full Value Of Property	Personal Income	General Property Taxes	Elasticity Coefficients	
				Tax Base	Income
1957	\$22,316,000	\$7,499,000	\$123,863.20	$\frac{2.7}{8.9} = 0.30$	$\frac{2.7}{5.9} = 0.46$
1958	24,278,000	7,944,000	127,188.16	$\frac{1.5}{6.9} = 0.22$	$\frac{1.5}{9.1} = 0.16$
1959	25,965,000	8,668,000	129,058.12	$\frac{26.4}{13.4} = -1.97$	$\frac{26.4}{3.1} = 8.52$
1960	22,496,000	8,938,000	163,128.49	$\frac{-4.2}{8.5} = -0.47$	$\frac{4.2}{-7.8} = 0.58$
1961	24,411,000	8,288,000	156,208.70	$\frac{3.2}{7.9} = 0.41$	$\frac{3.2}{5.6} = 0.57$
1962	26,339,000	8,756,000	161,276.23	$\frac{3.8}{10.7} = 0.35$	$\frac{3.8}{6.7} = 0.57$
1963	29,165,000	9,345,000	167,401.45	$\frac{3.2}{12.5} = 0.26$	$\frac{3.2}{8.5} = 0.38$
1964	32,824,000	10,142,000	172,752.30	$\frac{2.4}{13.2} = 0.18$	$\frac{2.4}{3.7} = 0.65$
1965	37,162,000	10,513,000	176,857.73	$\frac{13.6}{34.4} = 0.31$	$\frac{13.6}{13.7} = 0.99$
1966	49,958,796	11,946,000	200,828.48		
1959-1965				$\frac{37.0}{43.1} = 0.86$	$\frac{37.0}{21.8} = 1.78$
1957-1966				$\frac{62.1}{123.9} = 0.50$	$\frac{62.1}{59.3} = 1.05$

SOURCES: Kentucky Department of Education and Sales Management, Inc.

Periodically revenue needs exert sufficient pressure to require a major adjustment in the assessment to increase the taxes collected.

From 1956 to 1959, the full value of taxable property increased from \$19,957,000 to \$25,965,000, an increase of 30.1 percent. During the same period, the general property tax increased by only 5.7 percent, from \$122,128.49 to \$129,053.12. This shows that the effective tax rate had been declining in the previous three years (Table A-XII). In 1960, the Trigg County School system adjusted its assessment to increase property tax revenue when it was needed as expenditures increased by 31.5 percent from 1959 to 1960 (14). The adjustment complemented the additional revenue needs of the Trigg County government (Table 13). This kind of adjustment is one reason why period, as contrasted with annual, changes in tax severity better index long term trends.

Examination of the financial data for the Trigg County School system shows that payment of federal funds started in 1959, and the payment was \$11,172.36. In the years following 1959, the payments under Public Law 874 were usually larger (Table 16). From 1962 through 1966, the federal funds received by Trigg County Schools under Public Law 874 averaged approximately \$32,000, ranging from a low of \$8,640.00 in 1964 to a high of \$68,586.00 in 1965. These large payments reduced the need for large increases in the general property tax from 1960 on through the period studied.

The fluctuation in the amount of funds received under Public Law 874 causes budgeting problems in the recipient school system in the face of the uncertainty of the amount of P. L. 874 funds, if any, which will be received. The variation from \$8,640 to \$68,586 in one year (approximately ten percent of the total budget) is a good example of the vicissitude in receiving Public Law 874 funds. There is no permanance to the receipt of these funds from year to year as their amount and even their existence depends upon the vagaries of

TABLE 16
 PUBLIC LAW 874 FUNDS RECEIVED
 ANNUALLY BY LYON AND TRIGG
 COUNTY SCHOOL SYSTEMS,
 1959-1967

Year	Lyon County Schools	Trigg County Schools
1959	\$ 19,594.00	\$ 11,172.36
1960	11,270.27	5,015.00
1961	43,594.17	25,552.00
1962	24,886.00	27,670.00
1963	23,015.00	22,152.00
1964	6,851.00	8,640.00
1965	33,458.00	68,586.00
1966	26,108.00	19,639.00
1967	4,515.00	77,124.00

SOURCE: Kentucky Department of Education

Congress. These funds are proportioned among eligible counties on the basis of assessment lost from the tax rolls times the tax rate; however, the amount received by a given school district depends upon the total amount of funds appropriated, and the number and enrollment of school districts receiving these funds. In addition, these funds must be used for current expenditures, and not for servicing debts or for capital outlay. No explicit provision is made for the termination of these funds in cognizance of the increase in the tax base following completion of the reservoir project and the increasing ability of people to pay more in property taxes at the local level.

COMPARISON OF THE SEVERITY OF COUNTY AND SCHOOL TAXES IN LYON AND TRIGG COUNTIES WITH THE STATE AVERAGES

Comparison of the tax severity measures of Lyon and Trigg County governments with those of the state (average of all counties) show that these two counties had a significantly smaller than average increase in tax severity from 1957 to 1966. These comparisons are shown on Table 17. Both elasticity coefficients, income and tax base, are elastic for the state. The same coefficients for Lyon and Trigg Counties are inelastic. The growth of the tax base in Lyon and Trigg Counties is responsible for the small coefficients of tax base elasticity.

Comparison of the Lyon County and Trigg County School districts with the state averages give mixed results. The tax base elasticity coefficient for all schools in Kentucky is slightly elastic--1.02. In the Lyon and Trigg Schools the growth of the tax base mitigated the severity of the school property tax, thus yielding inelastic coefficients. On the other hand, the income elasticity coefficients are slightly elastic, 1.01 and 1.05, for Lyon and Trigg County Schools, respectively. These coefficients are larger than the inelastic measure of 0.88 for the state.

TABLE 17
 COMPARISON OF TAX SEVERITY INDICES IN
 LYON AND TRIGG COUNTY GOVERNMENTS,
 LYON AND TRIGG COUNTY SCHOOL SYSTEMS
 WITH TAX SEVERITY INDICES OF KENTUCKY
 COUNTIES AND SCHOOLS, 1957-1966.

Taxing Jurisdiction	Base Elasticity Coefficients	Income Elasticity Coefficients
Lyon County	0.62	0.77
Trigg County	0.45	0.94
All Counties	1.53	1.39
Lyon County Schools	0.81	1.01
Trigg County Schools	0.50	1.05
All Schools	1.02	0.88

SOURCES: Kentucky Department of Education, Kentucky Department of Revenue, and Sales Management, Inc.

SUMMARY AND CONCLUDING REMARKS

The Barkley Reservoir is the largest of the three reservoirs investigated in this study. The total cost of the project was approximately \$142,000,000. Of the total, \$14,507,319 was spent for land acquisition. Land purchases in Lyon and Trigg Counties totaled 59,458 acres. The purchase of this land affected 350 farms, 470 houses, and 1,045 people. The construction of the reservoir and the inundation of land resulted in the relocation or abandonment of 25 miles of road in Lyon County and 30 miles of road in Trigg County. In Lyon County, 7 miles were relocated and 18 abandoned. In Trigg County, 10 miles were relocated and 20 abandoned. The reservoir was built for flood control, hydroelectric power, navigation, recreation, and water supply purposes. It is estimated by the Corps of Engineers that the total benefits accruing from the project will approximate \$9,890,000 annually.

The Barkley Reservoir is located in Lyon and Trigg Counties in the western section of the state. These counties are primarily agricultural, having very little manufacturing or other industry. These counties have experienced a relatively large amount of economic growth simultaneous with reservoir development, but per capita incomes are still below the state average. The population of Lyon County has decreased continuously since 1910, when the population was 9,423. By 1966, the population had declined to 5,500. From 1910 to 1960, the population of Trigg County declined from 14,539 to 8,870 but remained almost static during the development of the Barkley Project. The Barkley Reservoir also necessitated the relocation of two Lyon County towns--Eddyville and Kuttawa. The relocation of these towns was partly responsible for some of the population loss in Lyon County because of the short-run shortage of local housing.

This chapter examined the impact of the Barkley Reservoir on property taxes available to the county governments and school districts located in these counties. There was no direct effect on local expenditures caused by the Barkley Project. This was due to workers locating in larger towns outside the affected counties, and the relatively long period of time involved in land acquisition and construction.

Land acquisition occurred over a six-year period from 1959 through 1965. The total period studied encompassed the decade from 1957 through 1966. This period allowed examination of the annual changes from the time prior to land acquisition until the end of land acquisition and construction. The method of assessing the impact on property tax revenue was that of computing elasticity coefficients for the change in property tax payments relative to the changes in the full value of the tax base and personal income. Annual coefficients were used to measure the annual fluctuations in the severity of the property tax. In addition, coefficients were computed for the entire period of development to assess the change in the severity of property taxes from 1957 to 1966 and also the change in the severity during the period of land acquisition from 1959 to 1965. The total period change was compared with the statewide average.

Lyon and Trigg Counties have lost large amounts of acreage from their tax rolls to various federal projects. In all, Lyon County has lost about 45 percent of its total area, and Trigg County about 38 percent of its total area. These large losses have caused considerable concern among local officials about the ability of their local governments to raise sufficient tax revenue. In February, 1964, the Lyon County fiscal court went on record opposing any further acquisition of land in Lyon County by any government agency for any purpose (31). Furthermore, Lyon and Trigg County governments engaged the Rowe and Company engineering firm in 1959 to study their tax situation and make recommendations as to possible

courses of action to mitigate the large physical loss of assessment. The large losses of land did not, however, create as serious a tax burden as was originally anticipated.

During the period of reservoir development, the full value of the tax base in the two counties showed unusual growth. The tax base in Lyon County increased from \$13,560,000 in 1957 to \$33,097,468 in 1966, an increase of 144.1 percent in the ten year period. The increase in the tax levy for Lyon County increased by only 89.1 percent, from \$11,917.48 to \$22,536.89. During this period the severity of the real estate tax diminished as evinced by the inelastic tax base coefficient of 0.62. During the period of land acquisition, the tax base coefficient was even more inelastic--0.34. This resulted from the exclusion of 1966, when taxes increased by 28.9 percent.

In Trigg County the tax base increased by 123.9 percent, from \$22,316,000 in 1957 to \$49,958,796 in 1966. (The growth of the tax base in both Lyon and Trigg Counties was exceptionally large when compared to the growth of the tax base for the entire state--57.6 percent from 1957-1966.) The increase in the real estate tax levy was much smaller than the base increase, increasing by only 55.9 percent from \$27,408.83 in 1957 to \$42,719.64 in 1966. These changes yield a very inelastic tax base coefficient of 0.45. At the end of reservoir development the real estate tax burden had diminished to less than one-half the pre-reservoir level, relative to the increase in tax base. During land acquisition the tax base coefficient is 0.71, reflecting a decrease in tax severity as land was removed from the tax rolls.

There was a marked difference in the growth of personal income in the two counties. From 1957 to 1966, personal income in Lyon County grew from \$4,945,000 to \$10,660,000, an increase of 115.6 percent. This increase was considerably larger than the increase in real estate taxes

(89.1), yielding an income coefficient of 0.77--also, inelastic. The growth in personal income in Trigg County was approximately one-half that of Lyon County--59.3 percent. However, this was still larger than the increase in taxes (55.9), yielding a slightly inelastic income coefficient of 0.94. In both counties, the increase in capacity to pay real estate taxes, as measured by personal income, increased faster than the increase in taxes from 1957 to 1966. The difference in income growth in the two counties is more readily noted when the period of land acquisition is examined. During the 1959-65 period, income increased by 70.4 percent in Lyon County and only 21.3 percent in Trigg County. This resulted in income coefficients of 0.34 for Lyon County and 1.43 for Trigg County.

The general property taxes levied by the school districts show essentially the same pattern. What would have otherwise been a large increase in school property tax was prevented by the receipt of funds under Public Law 874 to compensate school districts for their loss of assessment. In Lyon County, the general property tax increased by 116.2 percent from 1957 to 1966, from \$42,351.44 to \$90,311.61. This was a considerable increase, but still less than the increase in tax base--144.1 percent. The tax base coefficient for the period change is 0.81--inelastic. The tax base coefficient for the 1957-1965 is slightly larger-- 1.05. The increase in the Trigg County property tax was only 62.1 percent--about one-half the increase in Lyon County. The full value of taxable property in Trigg County increased by 123.9 percent, yielding a tax base coefficient of 0.50. Over the land acquisition period the coefficient is 0.86, also inelastic. In both counties, the growth in capacity to pay the general property tax, as measured by taxable property, far outstripped the increase in the tax levy. Because of federal funds paid to the school districts for the loss of tax assessment, even though assessments have doubled, school officials have not found it necessary to take advantage of the increase in tax paying capacity. (Lyon

County has the lowest school tax rate in Kentucky: 0.332 per \$100 of assessment in 1968.) If P. L. 874 funds are ever terminated--and there is no guarantee that they will not be--there will have to be a sizeable increase in the general property tax levy.

The growth in personal income in these counties was only slightly less than the growth in the general property tax. In Lyon County personal income increased by 115.6 percent, yielding an income elasticity coefficient of 1.01, almost unitary. In Trigg County personal income increased by 59.3 percent, slightly less than the increase of 62.1 percent in the general property tax. These values yield an income coefficient of 1.08, only slightly elastic. During land acquisition, the coefficients were slightly larger: 1.05 for the Lyon County System and 1.78 for the Trigg County System. These larger coefficients are explainable by the 1960-61 recession which are compensated for by the large increase in income in 1966. (The 1966 income is not included in data for the land acquisition period.)

In terms of the measures of tax paying capacity, base and income, the school property tax was inelastic relative to tax base, and almost unitary vis-a-vis personal income, for both Lyon and Trigg Counties. This supports the hypothesis stated in Chapter II that construction of a large reservoir does not impair the ability of local governments to raise needed property tax revenue. This conclusion is, however, limited to land acquisitions up to the size for the particular reservoir studied. The conclusion for the last reservoir (in contrast with the other two is in part contingent on the receipt of federal subsidies by the affected school districts obviating large increases in general property taxes.

CHAPTER VI
SUMMARY AND CONCLUSIONS

DESCRIPTION OF STUDY

The purpose of this study was to ascertain the influence construction of a large reservoir has on the tax revenue available to and the expenditures required of local government. Case studies were used because they permit in depth qualitative analysis of observed relationships. Three large multi-purpose reservoirs constructed during the period from 1957 to 1968 (Barkley, Barren, and Green) in south central and western Kentucky were selected to provide the experience data. The effect construction of these three reservoirs had on county governments and school districts which sacrificed part of their tax base for right-of-way was then analyzed. Other types of local government were not considered in detail because they seldom serve the more isolated rural areas where reservoir construction typically takes place.

It is usually an a priori assumption of local officials that the purchase of land by the federal government for reservoir construction will diminish the property tax base, on which local government traditionally depends, and fiscally weaken county governments and school districts because of inter-governmental tax immunity. In addition, reservoir construction may, by attracting new people into an area or by disrupting past service patterns, increase the demand for certain local government services. This study examines these two possibilities in the light of the experience of the local governments affected by the three reservoirs chosen for the case studies. The analysis concentrates on short-run effects (those occurring during the period of land acquisition and reservoir construction) because the adverse financial impact is manifestly most severe during this interval.

APPROACH

To measure time trends in the ability of local county governments and school districts to raise needed tax revenue, the concept of tax severity is introduced. Tax severity for a given group of taxpayers may be indexed by the ratio of the tax levy to measures of tax capacity. The tax levy is the total amount of the property tax assessment before discounts and exemptions. Tax capacity or the ability to pay taxes is indexed in two ways: (1) by the full dollar value of taxable property, and (2) by personal income of the affected taxpayers. Comparisons between changes in tax levies and tax paying capacity yield elasticity coefficients from which fluctuations in the severity of the property tax can be determined from year to year and trends over a longer period of time can be deduced. If property values and personal income increase relatively faster than the property tax levy, the elasticity ratios are less than one and denote a decreasing tax severity. Relatively slower increases in property values and personal income denote an increasing tax severity.

A sudden acquisition of land for reservoir right-of-way would reduce the tax base by removing land from the tax rolls and reduce personal income by the amount of income earned from the land. The acquisition of land for reservoir right-of-way actually occurs over several years. During this time, many forces unrelated to the reservoir will affect and cause fluctuations in both the tax levies and the indices of tax capacity. Economic growth may be accelerated in anticipation of future project benefit. The elasticity ratios are used in assessing whether the land acquisition is sudden enough and large enough to significantly alter the ability of the typical rural government to obtain needed property tax revenues in the institutional setting of typical project construction. Elasticity ratios indicating decreasing tax severity suggest a strengthening of the fiscal position of the affected local governments despite the loss of tax base to reservoir development.

To measure expenditure effects information is obtained from discussions with county government and school officials. The trend in gross expenditures is to rapidly increase with time while at the same time exhibit significant fluctuation in the annual rate of increase in response to the availability of funds, changing demands for services, and changes in administrative personnel. Consequently, it is impossible to deduce any expenditure effects from a relatively small cause, such as providing the government services associated with reservoir construction, from analysis of time trends in gross expenditure data. Expenditure effects can only be ascertained from an analysis of the cost of specific services known to be caused by reservoir construction.

The analysis begins with the hypotheses that under conditions typically existing under construction of a large reservoir in rural areas the resultant land acquisition will not increase the tax severity and changes in service requirements will not significantly increase required expenditure. The necessary data was then collected and analyzed to determine whether or not the proposed hypotheses could be supported.

PRINCIPAL FINDINGS

The findings generally support the first hypothesis that tax severity diminishes during the period of land acquisition and reservoir construction, with respect to taxes collected by those county governments and school districts located in the reservoir area. In fact, the results of the three case studies show that the larger the reservoir and the more acreage acquired, the more inelastic the elasticity coefficients and the smaller the degree of tax severity. In the Barkley Reservoir area, the largest of the three studied in terms of land taken for reservoir right-of-way, the elasticity coefficients are more inelastic than those of the smallest reservoir. Selected statistics for the three reservoirs are summarized in Table 18.

Table 18

SUMMARY OF SELECTED STATISTICS FOR THE RESERVOIRS STUDIED

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Barren													
Allen	7,528	3.0	4.5	0.7		1.26		1.15		1.50		1.38	
					1961-64		2.45		1.35		1.40		1.29
Barren	12,580	4.0	4.3	0.8		1.50		1.62		0.98		0.99	
Green													
Adair	16,417	6.5	8.4	3.1		0.34		0.77		0.35		0.76	
					1964-67		3.05		1.80		1.08		1.12
Taylor	16,109	8.8	10.4	3.8		0.00		1.07		0.00		1.43	
Barkley													
Lyon	31,578	19.5	34.8	9.9		0.62		0.81		0.77		1.01	
					1959-65		1.53		1.02		1.39		0.88
Trigg	27,880	9.5	16.6	5.1		0.45		0.50		0.94		1.05	

1. Reservoir
2. Number of Acres Purchased
3. Percent of County Land Purchased
4. Percent of Farm Land Purchased
5. Percent of Gross Tax Assessment Purchased
6. Land Acquisition Period
7. County Base Elasticity Coefficients

8. All Counties (Kentucky) Base Elasticity Coefficients
9. School Base Elasticity Coefficients
10. All Schools (Kentucky) Base Elasticity Coefficients
11. County Income Elasticity Coefficients
12. All Counties (Kentucky) Income Elasticity Coefficients
13. School Income Elasticity Coefficients
14. All Schools (Kentucky) Income Elasticity Coefficients

The case study revealed a number of potential explanations for the growth in tax base and personal income in those counties located in the reservoir area. First, the period of study, 1957-1968, was one of pervasive economic growth throughout the state and nation. Second, changes were noted in the economic environment in those counties where reservoirs are built. Reservoirs improve the economic infrastructure in the reservoir area by attracting industry and recreation. Also, the income received from reservoir land sales is used to improve remaining property thus increasing its economic value.¹ Third, there was a tendency in those counties which experienced a displacement of people for the less productive--older people and the nonemployable--to leave the county (move from rural to urban areas). This (coupled with the influx of new higher income people attracted by the improved economic environment) tended to have a salutary effect. As per capita incomes tended to increase very rapidly in some affected counties e. g. , Lyon County. Lastly, land was acquired on a piecemeal basis over a period of three to six years (as it typically is for most large projects) thus allowing time for the local infrastructure to make offsetting changes in property assessments to reflect changes in property value. In some counties, especially Allen County, the assessment adjustment was made by decreasing the total farm assessment by a smaller amount than the proportion of the farm lost to the reservoir.

In comparison with average elasticity coefficients computed for the corresponding time periods for all county governments and school districts in the state, the elasticity coefficients are generally less severe in the reservoir area. The exceptions are out of twelve index-government combinations, one county government and five school districts. County governments

¹ A companion study by Michael B. Hargrove (Research Report No. 21) is studying reservoir caused changes in the local economic base in greater detail.

exhibited a marked difference between the counties in this study and the state-wide averages. The explanation seems to be that county government in rural areas has sufficient excess capacity to handle the service needs of a relatively stable population. Schools are under greater pressure to upgrade facilities and increase salaries and thus seek new tax revenues. New state and federal subsidies pay part of the increasing cost nevertheless, the greater pressure to increase expenditures makes school districts more sensitive to any loss in potential tax base.

The school districts in Lyon and Trigg Counties were buffered against the impact of assessment loss by a subsidy (P. L. 874 funds) granted to districts losing more than ten percent of their tax base to federal projects. These funds more than compensated for losses of assessment during the latter stage of reservoir development. The receipt of these funds obviated the need for large increases in property taxes which would otherwise been required.

The Corps of Engineers mitigates the effect of reservoir location on urban areas by paying all necessary relocation costs. The town of Eddyville and Kuttawa in Lyon County were relocated in locations more conducive to economic and population growth. Their growth in the new location contribute to the county wide increase in assessable property value and personal income.

Construction workers on the reservoir projects were found to generally prefer living in a larger town 30 to 50 miles from the construction site to living in closer but smaller towns. Thus, with the one exception of workers on the Green River Reservoir living in Taylor County, the local governments required to provide public services to construction workers were not the same as those losing tax base to project right-of-way. In parts of the country having larger counties, this separation of effects should occur less frequently.

Workers on the Green River Reservoir concentrated in Taylor County and Campbellsville, its county seat. The small increase in population did not increase county government expenditures but school costs were affected. The Taylor County District added two classroom units attributed to the presence of reservoir workers. In addition, the Campbellsville Independent School system added one classroom unit. The resultant additional costs accrued during the school years from 1963-64 to 1967-68. In the other counties where reservoir construction took place, too few construction workers lived in the local area to cause any increase in the costs of local governments or schools. Most of the workers on the Barren River Reservoir located in the city of Bowling Green. The workers on the Barkley Reservoir located in Central City, Hopkinsville, and Paducah. Such larger municipalities are better able to cope with population increments than the smaller towns nearer the reservoir construction sites.

It is found by investigating school budgeting restrictions that instructional costs of schools are sensitive to enrollment and attendance changes; an increase of about thirty students generally causes an increase in instructional costs. County government costs, on the other hand, are inexorable to small population changes in the short-run. The structure of local government is such that considerable flexibility and capacity are available for rendering a given amount of services to a population undergoing change, either up or down.

IMPLICATION FOR PROJECT PLANNING

Contrary to the fear widely held by soon-to-be-affected local government officials, these case studies did not substantiate a significant adverse fiscal effect caused by reservoir development. The data seems rather to support the converse that, in the context of existing institutional arrangements,a

reservoir ameliorates the fiscal situation of county governments and school districts. Therefore, when local officials express concern over expected assessment and property tax losses those responsible for project planning should be able to assure them that other counties in a like situation have not experienced significant difficulty. A good public relations job from this point of view may be essential for the project to be accepted politically because local public officials can influence project selection.

However, planners need to be aware of the potential fiscal disruption which a large reservoir can inflict on a local community. The ability of the governments in the case study areas to adjust may well depend on the gradual process typically used in reservoir construction and right-of-way acquisition. An accelerated land-buying program, a large influx of construction workers into an isolated rural community, or impaired communications between federal planners and local officials may create significant fiscal or political problems.

IMPLICATION FOR LOCAL GOVERNMENTS

Local government officials are generally quite concerned about the loss of tax base and the fiscal problems incident to the loss of tax assessment. In the nascent stage of project development, county and school officials are typically alarmed at the prospect of losing ten percent or more of the county tax base to reservoir impoundment. In most instances, these officials do not doubt that economic growth over the long-run will overcome the short-run loss of potential tax revenue. Their primary concern is directed toward the period of land-acquisition and reservoir construction. The results of this study demonstrate that even in the short-run there is no substantial financial stress placed on county governments and school districts. In the case of

school districts, P. L. 874 funds provided when the assessment of property is diminished by ten percent or more were sufficient to prevent any abnormal increase in tax severity.

The growth of personal income and taxable property in the counties investigated in this study would seem to indicate that a rural county would-- in terms of short-run and long-run increases in property values and income-- enhance its potential tax revenue and reduce tax severity by the location of a reservoir. County governments and school districts may even fare better in terms of tax revenue and expenditure with a large multi-purpose reservoir than with certain kinds of industry (9). Reservoirs enhance property values while not increasing expenditures or increasing them only temporarily. Industry may attract outside workers and their families into an area on a permanent basis, thereby increasing county government and school costs more than tax revenue. In addition, the reservoir provides numerous benefits to the entire community in the form of flood control, recreation, and water conservation.

SUGGESTIONS FOR FURTHER INQUIRY

This study is concerned with only the impact on local government resulting from the development of a large multi-purpose reservoir. Many other federal projects may have favorable or unfavorable effects, occurring in varying time patterns, on local government finance--military reservations, highways, urban renewal--to name a few. The ownership of property and the expenditure of funds by the federal government and the resultant effect on local and state government open up a vista for study of intergovernmental relations. A plethora of questions is raised by the doctrine of intergovernmental immunity. For example, do local governments, which rely heavily on the property tax, receive more revenue from taxes than from various

government subsidies and incidental benefits after federal land acquisition?

If not, in what time pattern should local governments be remunerated? Should they be allowed to tax federally owned property? What can those responsible for federal programs do to minimize adverse effects on local government?

Hopefully, future research will be able to explore each of these issues in greater depth.

APPENDIX A
County and School Tax Rates

TABLE A-I

TOTAL TAX RATE AND EFFECTIVE TAX RATE PER \$100.00 OF ASSESSED VALUATION FOR ALLEN COUNTY GOVERNMENT, 1960-1967

Year	Total Tax Rate	Effective Tax Rate ^a
1960-61	.60	.208
1961-62	.60	.182
1962-63	.60	.169
1963-64	.60	.174
1964-65	.54	.153
1965-66	.54	.145
1966-67	.153	.153

SOURCE: Kentucky Department of Revenue and Kentucky Department of Education.

^aEffective tax rate determined by dividing property tax liability by actual value of property subject to taxation.

TABLE A-II

TOTAL TAX RATE AND EFFECTIVE TAX RATE PER \$100.00 OF ASSESSED
VALUATION FOR BARREN COUNTY GOVERNMENT, 1960-1967

Year	Total Tax Rate	Effective Tax Rate
1960-61	.50	.126
1961-62	.50	.118
1962-63	.50	.117
1963-64	.50	.117
1964-65	.50	.113
1965-66	.50	.105
1966-67	.120	.120

SOURCE: Kentucky Department of Revenue and Kentucky Department of
Education.

TABLE A-III
TOTAL TAX RATE AND EFFECTIVE TAX RATE PER \$100.00 OF ASSESSED
VALUATION FOR ADAIR COUNTY GOVERNMENT, 1962-1969

Year	Total Tax Rate	Effective Tax Rate
1962-63	.70	.209
1963-64	.70	.206
1964-65	.70	.193
1965-66	.70	.176
1966-67	.135	.135
1967-68	.135	.135
1968-69	.146	.146

SOURCE: Kentucky Department of Revenue and Kentucky Department of
Education.

TABLE A-IV

TOTAL TAX RATE AND EFFECTIVE TAX RATE PER \$100.00 OF ASSESSED VALUATION FOR TAYLOR COUNTY GOVERNMENT, 1962-1969

Year	Total Tax Rate	Effective Tax Rate
1962-63	.70	.226
1963-64	.70	.218
1964-65	.70	.213
1965-66	.70	.159
1966-67	.126	.126
1967-68	.126	.126
1968-69	.126	.126

SOURCE: Kentucky Department of Revenue and Kentucky Department of Education.

TABLE A-V

TOTAL TAX RATE AND EFFECTIVE TAX RATE PER \$100.00 OF ASSESSED
VALUATION FOR LYON COUNTY GOVERNMENT, 1957-1967

Year	Total Tax Rate	Effective Tax Rate
1957-58	.50	.186
1958-59	.50	.199
1959-60	.50	.181
1960-61	.50	.172
1961-62	.50	.159
1962-63	.50	.147
1963-64	.50	.148
1964-65	.50	.130
1965-66	.50	.124
1966-67	.091	.091

SOURCE: Kentucky Department of Revenue and Kentucky Department of
Education.

TABLE A-VI

TOTAL TAX RATE AND EFFECTIVE TAX RATE PER \$100.00 OF ASSESSED
VALUATION FOR TRIGG COUNTY GOVERNMENT, 1957-1967

Year	Total Tax Rate	Effective Tax Rate
1957-58	.50	.173
1958-59	.50	.161
1959-60	.50	.150
1960-61	.50	.215
1961-62	.50	.191
1962-63	.50	.180
1963-64	.50	.168
1964-65	.50	.153
1965-66	.50	.139
1966-67	.104	.104

SOURCE: Kentucky Department of Revenue and Kentucky Department of
Education.

TABLE A-VII

TOTAL TAX RATE AND EFFECTIVE TAX RATE PER \$100.00 OF ASSESSED
VALUATION FOR ALLEN COUNTY SCHOOL SYSTEM, 1960-1968

Year	Total Tax Rate	Effective Tax Rate
1960-61	1.50	.473
1961-62	1.50	.423
1962-63	1.50	.392
1963-64	1.50	.406
1964-65	1.50	.393
1965-66	1.50	.391
1966-67	.420	.420
1967-68	.559	.559

SOURCE: Kentucky Department of Education.

TABLE A-VIII

TOTAL TAX RATE AND EFFECTIVE TAX RATE PER \$100.00 OF ASSESSED VALUATION FOR BARREN COUNTY SCHOOL SYSTEM, 1960-1968

Year	Total Tax Rate	Effective Tax Rate
1960-61	1.50	.390
1961-62	1.58	.384
1962-63	1.58	.392
1963-64	1.58	.379
1964-65	1.58	.358
1965-66	1.65	.341
1966-67	.406	.406
1967-68	.432	.432

SOURCE: Kentucky Department of Education.

TABLE A-IX
TOTAL TAX RATE AND EFFECTIVE TAX RATE PER \$100.00 OF ASSESSED
VALUATION FOR ADAIR COUNTY SCHOOL SYSTEM, 1961-1968

Year	Total Tax Rate	Effective Tax Rate
1961-62	2.00	.436
1962-63	2.00	.535
1963-64	2.00	.531
1964-65	2.00	.495
1965-66	2.00	.455
1966-67	.439	.439
1967-68	.458	.458

SOURCE: Kentucky Department of Education.

TABLE A-X

TOTAL TAX RATE AND EFFECTIVE TAX RATE PER \$100.00 OF ASSESSED VALUATION FOR TAYLOR COUNTY SCHOOL SYSTEM, 1961-1968

Year	Total Tax Rate	Effective Tax Rate
1961-62	2.00	.612
1962-63	2.00	.579
1963-64	2.00	.587
1964-65	2.00	.552
1965-66	2.00	.491
1966-67	.513	.513
1967-68	.543	.543

SOURCE: Kentucky Department of Education.

TABLE A-XI
TOTAL TAX RATE AND EFFECTIVE TAX RATE PER \$100.00 OF ASSESSED
VALUATION FOR LYON COUNTY SCHOOL SYSTEM, 1957-1968

Year	Total Tax Rate	Effective Tax Rate
1957-58	1.50	.526
1958-59	1.50	.559
1959-60	1.50	.507
1960-61	1.50	.483
1961-62	1.50	.439
1962-63	1.50	.377
1963-64	2.00	.511
1964-65	2.00	.472
1965-66	2.00	.450
1966-67	.413	.413
1967-68	.435	.435

SOURCE: Kentucky Department of Education.

TABLE A-XII

TOTAL TAX RATE AND EFFECTIVE TAX RATE PER \$100.00 OF ASSESSED VALUATION FOR TRIGG COUNTY SCHOOL SYSTEM, 1957-1968

Year	Total Tax Rate	Effective Tax Rate
1957-58	2.00	.658
1958-59	2.00	.607
1959-60	2.00	.566
1960-61	2.00	.809
1961-62	2.00	.715
1962-63	2.00	.684
1963-64	2.00	.639
1964-65	2.00	.583
1965-66	2.00	.528
1966-67	.450	.450
1967-68	.470	.470

SOURCE: Kentucky Department of Education.

APPENDIX B

Population of Counties in the Three Reservoir Areas

TABLE B-I
 POPULATION OF COUNTIES IN THIS STUDY AND
 THE POPULATION OF KENTUCKY, 1900-1967

Year	Allen County	Barren County	Adair County	Taylor County	Lyon County	Trigg County	Kentucky
1900	14,657	23,197	14,888	10,075	9,319	14,073	2,147,174
1910	14,882	25,293	16,503	11,961	9,423	14,539	2,289,905
1920	16,761	25,356	17,289	12,236	8,795	14,208	2,416,630
1930	15,180	25,844	16,401	12,047	8,530	12,531	2,614,589
1940	15,496	27,559	18,566	13,556	9,067	12,784	2,845,627
1950	13,787	28,386	17,603	14,403	6,883	9,683	2,944,806
1960	12,269	28,303	14,699	16,285	5,924	8,870	3,038,156
1967	12,400	29,300	14,000	16,800	5,500	8,800	3,171,800

SOURCE: 1920, 1930, 1940, 1950, and 1960 U. S. Censuses of Population, 1967; Sales Management, Inc., Survey of Buying Power, June 10, 1968.

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