

Current and Projected Socioeconomic Conditions of the Levisa Fork of the Big Sandy River Basin of Kentucky and Virginia

GARY COX



Research Report No. 5

APPALACHIAN DEVELOPMENT CENTER
Morehead State University
Morehead, Kentucky

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Gary Cox

Head, Department of Geography
Morehead State University
Morehead, Kentucky

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Preface

The 1970s brought significant changes to the socio-economic climate of the Southern Appalachian region. The sudden resurgence in demand for the region's coal has impacted population, land use patterns, transportation, and the economic structure of the area. This research provides a broad overview of those socio-economic changes that have already occurred in a particular 11 county region surrounding the Big Sandy River of Kentucky and Virginia. In addition, it provides projections of population and housing through the year 2000, assuming increasing coal production.

The work should be of particular interest to public officials, regional planners, and residents of the Big Sandy area. Persons in other portions of coal-producing Appalachia should find the methods and some of the conclusions highly applicable to their areas as well.

Douglas Dotterweich
Editor

Abstract

After decades of economic decline and population loss, the Levisa Fork Basin has experienced a dramatic reversal of these trends during the 1970s. With the increasing demand for the region's high-grade bituminous coal, the basin is in a period of rapid economic expansion that is affecting the entire socio-economic structure of the valley.

This study is an analytical assessment of the social and economic situation in the 11 county area. The major focus of the study is directed toward the impact of increased mining activity on population, settlement patterns, land use, and the economic structure of the coal-rich basin. While this assessment is primarily concerned with the present socio-economic situation along the Levisa Fork and its tributaries, considerable effort has been given to projecting the future impact of continuing growth in coal production. It is assumed that the nation's need for energy will continue to stimulate the coal-based economy of the region for at least the remainder of this century.

Introduction

The Levisa Fork Drainage Basin sprawls across all or parts of 11 counties in Eastern Kentucky and Southwestern Virginia (Figure 1). It comprises part of a rugged, maturely dissected plateau made up of steep-sided ridges and a maze of narrow, twisting stream valleys deeply entrenched into the land. While not truly mountainous, it is one of the most rugged and difficult landscapes in North America. Usable land is generally limited to the narrow flood plains along the river and its tributaries. Although some physical variation exists from place to place in the basin, a remarkably similar physical environment prevails.

Rich deposits of high-grade bituminous coal lying in horizontal beds that outcrop along the sides of the hills provide the basin's greatest asset. The mining of this coal and related economic activities have concentrated a relatively large population into densely populated ribbons of settlement that almost invariably occupy the flood plains of the river and its tributaries. For more than seven decades, a volatile coal industry has led the region through a series of economic booms and reversals.

The purpose of this report is to provide an assessment of the social and economic conditions within the basin. It is possible to accumulate a large store of facts and statistics on the social and economic variables relating to a region without acquiring an overall understanding of the complex interrelationships that take place. At the beginning of this study, decisions had to be made as to the kinds of information needed for such an understanding.

Three problems were encountered throughout this endeavor. Most important was the availability of relevant, up-to-date information. Much of the available data were based on the 1970 Census or in some way derived or extrapolated from it, and are, needless to say, 10 years old. A second problem was that most data are on a county-unit basis, and the boundaries of the Levisa Fork Basin are not. The third problem was that some types of information were not available or were not in a usable form. These difficulties sometimes make it necessary to use estimates derived from a number of sources.

The statistical area used as a data base was the 11 counties that are all or partially within the Levisa Fork Drainage Basin (see Figure 2). This is referred to throughout the report as the L.F.W.E.A. (Levisa Fork Watershed Economic Area). The major problem with this is that almost 32 percent of the area of the L.F.W.E.A. is not in the Levisa Fork Drainage Basin. In fact, some of the 11 counties are almost entirely outside the basin. The percentage of each of the 11 counties within the drainage basin (L.F.B.) is given in Table 1.

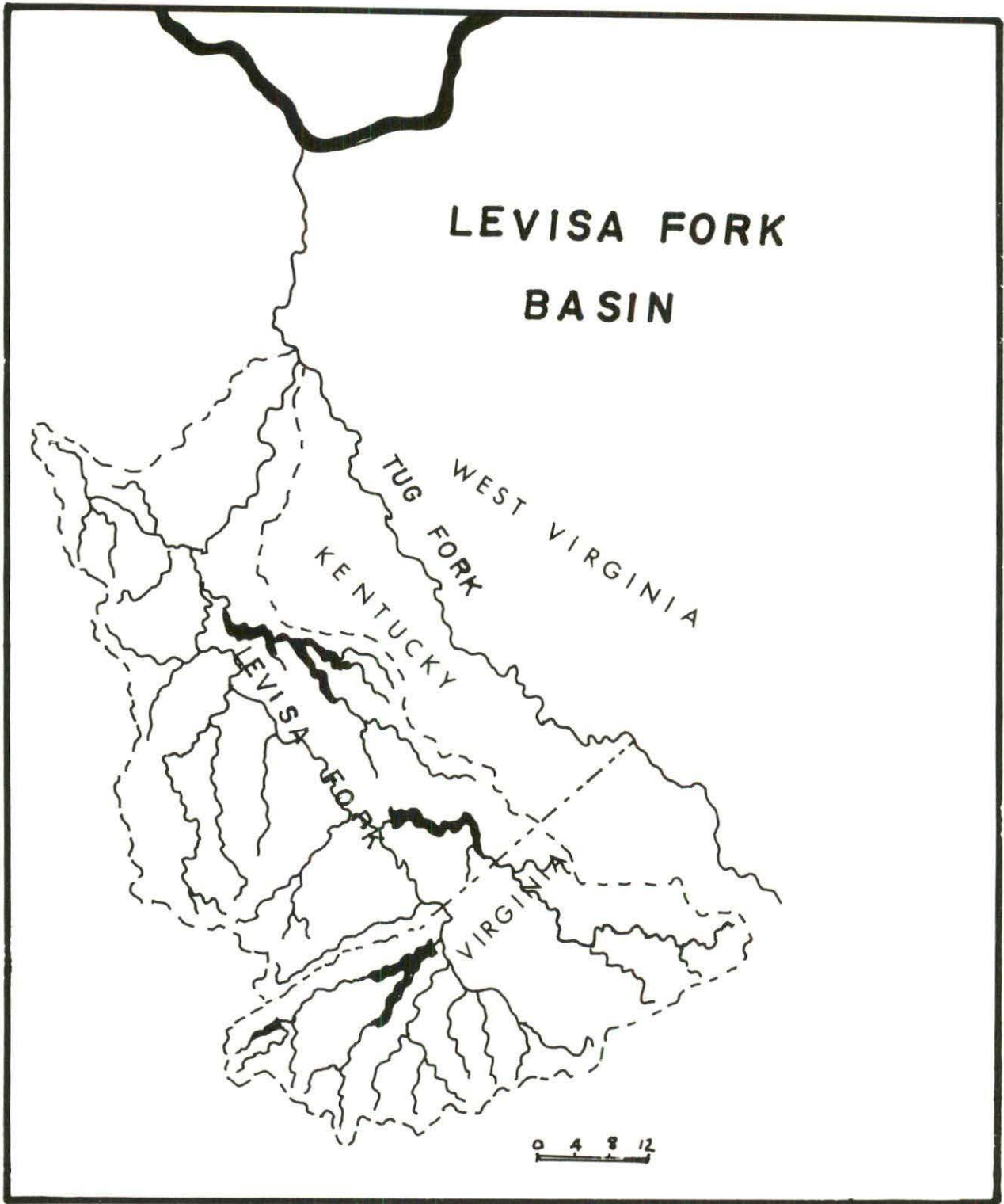


Figure 1. The Levisa Fork Drainage System (Big Sandy River Basin).

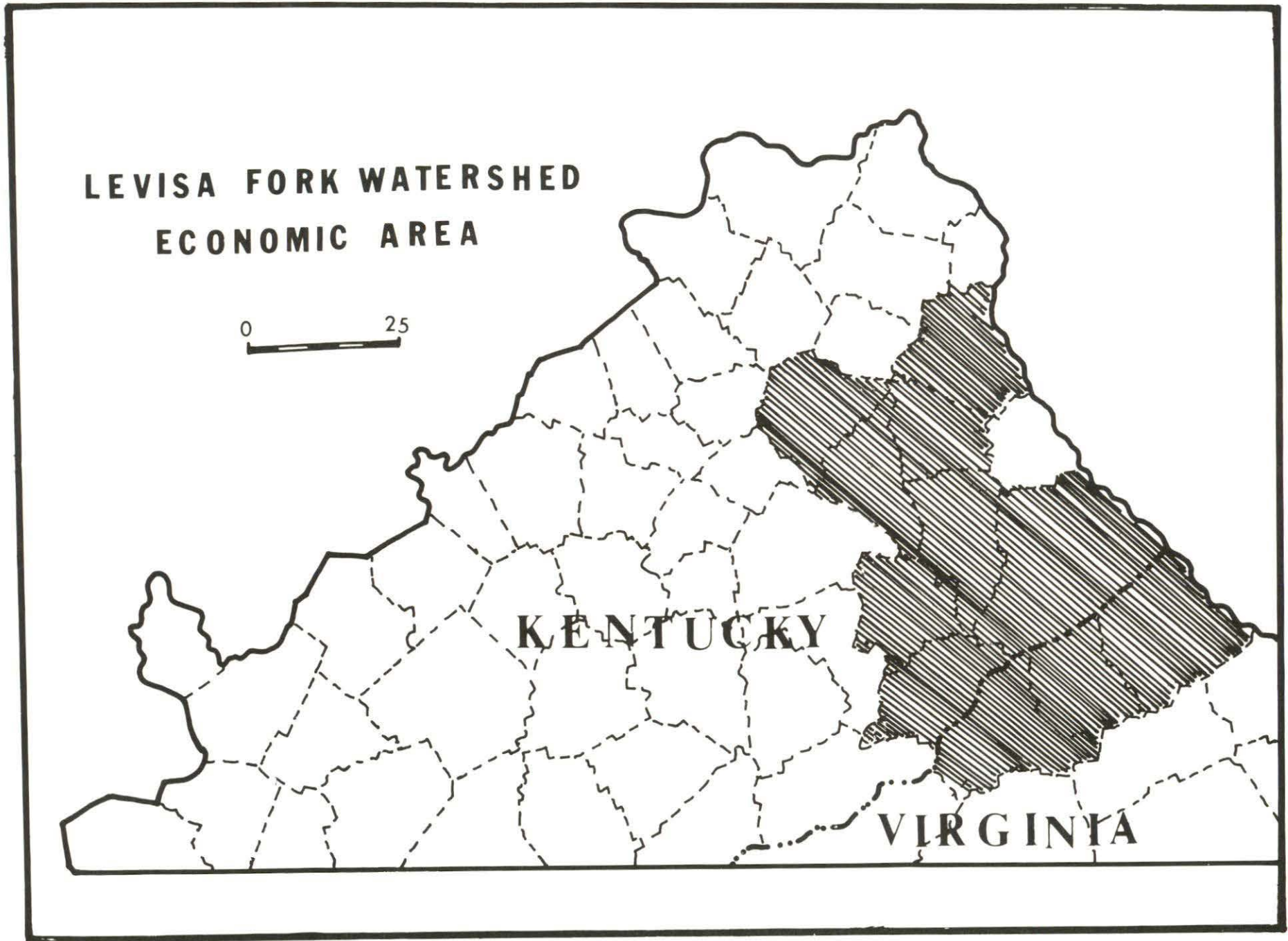


Figure 2. Levisa Fork Watershed Economic Area

**Table 1. Land Area
L.F.W.E.A. and L.F.B.**

County	L.F.W.E.A. Sq. Miles	L.F.B. Sq. Miles	L.F.B. Acres	% of County Unit in L.F.B.
Buchanan, Va.	508	404	258,534	79.5
Dickenson, Va.	332	327	209,203	98.5
Wise, Va.	412	124	76,544	29.1
Floyd, Ky.	399	399	255,360	100.0
Johnson, Ky.	264	224	136,960	84.8
Knott, Ky.	356	102	65,280	28.6
Lawrence, Ky.	425	101	64,640	23.8
Letcher, Ky.	339	19	12,160	5.6
Magoffin, Ky.	303	26	15,904	8.2
Morgan, Ky.	369	33	20,416	8.7
Pike, Ky.	782	587	375,680	75.1
TOTAL	4,489	2,346	1,490,676	52.3

Source: County areas within the Levisa Fork Basin (L.F.B.) were based on planimeter readings taken from U.S.G.S. topographic maps. Kentucky areas were checked against areas given in Kentucky Department of Natural Resources. 1978. *The River Basin Water Quality Management Plan for Kentucky*. Frankfort: Department of Natural Resources.

Where it was considered relevant or important to do so, county unit data used in the L.F.W.E.A. was broken down and a percentage was assigned to the Levisa Fork Drainage Basin (L.F.B.). In all cases where the designation L.F.B. is not used, the information provided in the report is for the L.F.W.E.A.

Projections for the remainder of this century have been made only in areas where trends are well established, or it was considered important for the purpose of this study. Estimates were made in some cases where precise data were not available. In every case these were based on the best information available, and are considered by the author to be reasonably accurate.

Population

Introduction

There is no shortage of material on the population of the Levisa Fork. The Bureau of the Census, the Appalachian Regional Commission, various other federal agencies, state governments, local and regional planning agencies, and numerous private researchers produce a plethora of population statistics, reports, and estimates. However, most of the materials have one limitation for use in this type of analysis. They are developed on a county-unit basis.

From this veritable cornucopia of demographic abundance, a decision had to be made as to which statistics to use for a meaningful profile of the population of the study area. The following data were deemed significant for an understanding of the Levisa Fork Basin: current population, population change, population characteristics, and population trends.

Current Population

The population of the 11 counties of the Levisa Fork Watershed Economic Area (L.F.W.E.A.) on January 1, 1980, was 344,343. This represents a surprising increase of 72,538 or 26.7 percent since 1970. It is estimated that 207,797 of these people resided in the counties or portions of counties within the Levisa Fork Basin. The population for each county in the L.F.W.E.A. and portions of each county in the L.F.B. is presented in Table 2.

Population Change

The Levisa Fork Basin, along with other coal-producing counties in Central Appalachia, has experienced wide fluctuations in population during the last half century. Table 3 lists the decennial populations of the L.F.W.E.A. counties from 1920 to 1970. Population grew rapidly in the basin during the early decades of the twentieth century, especially in the major coal-producing counties.

With the opening of the Eastern Kentucky coal fields, an economic boom developed in the Levisa Fork Basin that created a demand for large amounts of unskilled labor. The demand was so great that local manpower was unable to satisfy it, and thousands of non-Appalachians were imported. This was the first large-scale migration into the area since the valley was settled in the early nineteenth century. A more detailed discussion of this period is found in the section on "Community Cohesion."

Rapid population growth continued through the decade of the 1920s with a growth rate of 21.3 percent. This was well above the national growth rate of 16.1 percent and the Kentucky rate of 8.8 percent. Only Morgan and Lawrence counties showed a decline prior to 1930.

The economic boom was terminated by the Great Depression of the 1930s, but rapid population growth in the basin continued through the decade at rates more than double the state and national rates. This is surprising since the region lost its non-Appalachian elements during this period. Apparently any loss through out-migration was more than offset by other factors.

**Table 2. Population
1980**

County	L.F.W.E.A.	L.F.B.
Buchanan, Va.	37,989	30,201
Dickenson, Va.	19,806	19,509
Wise, Va.	43,863	12,764
Floyd, Ky.	48,764	48,764
Johnson, Ky.	24,432	20,718
Knott, Ky.	17,940	5,131
Lawrence, Ky.	14,121	3,361
Letcher, Ky.	30,687	4,265
Magoffin, Ky.	13,515	1,108
Morgan, Ky.	12,103	1,053
Pike, Ky.	81,123	60,923
TOTAL	344,343	207,797

Source: U.S. Department of Commerce, Bureau of the Census. 1980. *Census of Population*. Washington, D.C.: Bureau of the Census.

**Table 3. Population Trend
1920-1970**

County	1920	1930	1940	1950	1960	1970
Buchanan, Va.	15,441	16,470	31,477	35,748	36,724	32,071
Dickenson, Va.	13,542	16,163	21,266	20,211	20,211	16,077
Wise, Va.	46,500	51,167	52,458	56,336	47,779	40,119
Floyd, Ky.	27,427	41,942	52,986	53,500	41,642	35,889
Johnson, Ky.	19,622	22,968	25,771	23,846	19,748	17,539
Knott, Ky.	11,665	15,230	20,007	20,320	17,362	14,698
Lawrence, Ky.	17,643	16,713	17,275	14,418	12,134	10,726
Letcher, Ky.	24,467	35,702	40,592	39,522	30,002	23,165
Magoffin, Ky.	13,859	15,719	17,490	13,839	11,156	10,443
Morgan, Ky.	16,518	15,130	16,827	13,624	11,056	10,019
Pike, Ky.	49,477	63,267	71,122	81,154	68,264	61,059
L.F.W.E.A.	156,151	310,741	367,271	375,700	316,078	271,805

Source: U.S. Department of Commerce, Bureau of the Census. 1920 through 1970. *Census of Population*. Washington, D.C.: Bureau of the Census.

Rapid population growth during the 1930s was a result of the three-fold impact of external and internal economic factors and demographics (Cox, 1979). Most important was a continuing high birth rate well above the national average. Another major factor was the return migration of thousands of former residents displaced in northern cities. Finally, there was a damming up of would-be migrants from the Levisa Fork Basin. There was simply no place for Appalachia's poor to flee, and economic conditions in the basin were no more desperate than elsewhere in the country.

The decade of the 1940s witnessed a second great boom in coal production, but the study area did not experience a corresponding increase in population. In fact, a remarkable slowing of the growth rate occurred, and for the first time in this century, the L.F.W.E.A. population growth rate fell far below the national rate. The decennial growth rate was only 2.3 percent compared to a national rate of 14.5 percent. Six of the 11 counties recorded negative growth rates. Only Pike County in Kentucky and the counties of Buchanan and Wise in Virginia experienced significant growths.

Most of the slowing of growth in the 1940s can be attributed to two factors, one internal and the other external. Perhaps most significant was the tremendous increase in employment opportunities in the industrial centers of the north as the country went to a war-time economy. The other factor was the tremendous build-up of a reservoir of potential migrants in the L.F.W.E.A. during the 1930s. Thousands of people who remained in the basin and tried desperately to eke a living from a declining agricultural base during the depression migrated from the area when jobs became available in the defense plants of the north.

The slowing of population growth during the 1940s was the harbinger of things to come. At the end of the decade, the almighty coal industry of the Levisa Fork Basin all but collapsed. Employment declined drastically, bringing financial ruin and hardship to thousands of coal miners and other people who depended on the coal industry. The Levisa Fork was only one part of a distressed area encompassing the entire coal mining area of Appalachia. For almost two decades a deep economic depression gripped, crushed, and depopulated the coal producing region (Cox, 1980). In many ways the economic distress exceeded the Great Depression in severity. As Harry Caudill so aptly described the situation, night had come to the Cumberlands (Caudill, 1963).

The population change map of the period from 1950 to 1970 (Figure 3) vividly shows the results of this outmigration and decline. Although the loss of population during this period affected almost all of Central Appalachia, it was most devastating in the old, established bituminous coal-mining areas, including the Levisa Fork.

After two traumatic decades of stagnation and decline, a sudden reversal seemed highly improbable. However, with dramatic suddenness this unlikely reversal in a long-established trend occurred. By the end of the 1960s, the heavy outmigration from the study area had ended, and a reversal was underway. With dramatic and unanticipated suddenness, the population of the L.F.W.E.A. expanded by an estimated 73,098, or more than 23 percent. Tables 4 and 5 present the population estimates and change rates for each county. Much of this increase is a result of migration into the area (Figure 4). While there is a general belief that the dramatic shift in population of the basin is the result of increased production in the regional coal industry, the reasons are apparently much more complex.

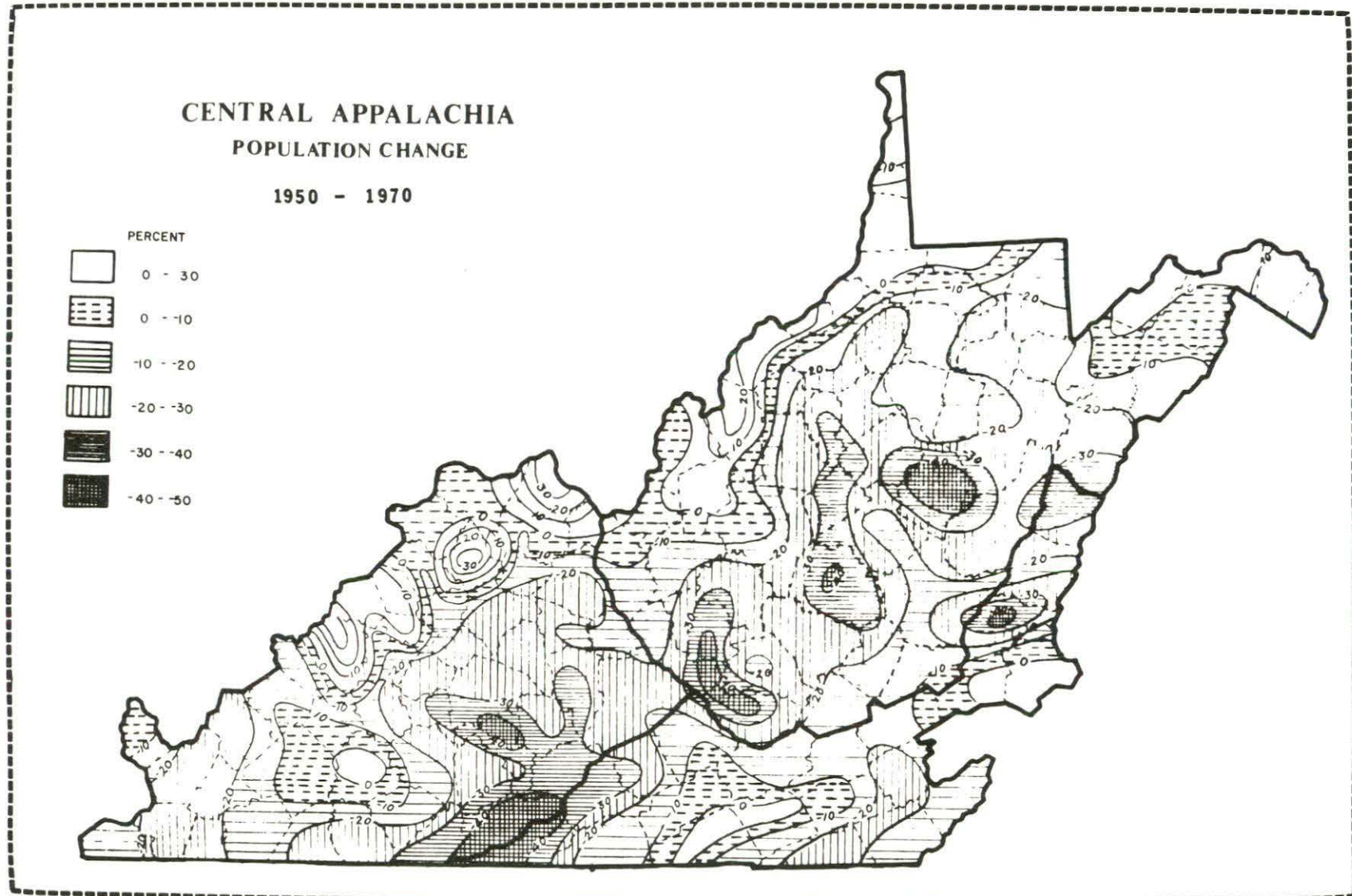


Figure 3. Central Appalachia Population Change 1950-1970.

**Table 4. Population Projections
1970-2000**

County	(a)1970	1975	1980	1985	1990	1995	2000
Buchanan, Va.	32,071	34,786	37,168	40,328	42,142	44,039	45,793
Dickenson, Va.	16,077	18,649	20,234	21,954	22,096	23,000	23,904
Wise, Va.	40,119	45,838	50,800	54,992	62,751	66,242	69,740
Floyd, Ky.	35,889	40,040	44,199	47,790	51,324	54,770	58,151
Johnson, Ky.	17,539	20,835	24,132	26,339	28,570	30,789	33,044
Knott, Ky.	14,698	16,932	19,165	21,246	23,438	25,621	27,809
Lawrence, Ky.	10,726	11,908	13,090	13,782	14,473	15,141	15,787
Letcher, Ky.	23,165	25,855	28,546	30,125	31,628	33,056	34,394
Magoffin, Ky.	10,443	12,140	13,837	14,770	15,788	16,813	17,779
Morgan, Ky.	10,019	10,654	11,288	11,881	12,507	13,116	13,703
Pike, Ky.	61,059	71,760	82,464	89,312	96,138	102,814	109,236
L.F.W.E.A.	271,805	309,397	344,923	372,519	400,855	425,401	449,340

(a) = Actual 1970 Census figures.

Sources: U.S. Department of Commerce, Bureau of the Census. Commonwealth of Virginia, Department of Planning and Budget. University of Louisville, Urban Studies Center, Population Research Unit.

**Table 5. Projected Population Change
1970-2000**

County	1970-75	1975-80	1980-85	1985-90	1990-95	1995-2000
Buchanan, Va.	2,715 + 8.5%	2,372 + 6.8%	3,160 + 8.5%	1,814 + 4.5%	1,887 + 4.5%	1,754 + 4.0%
Dickenson, Va.	2,572 + 16.0%	1,585 + 8.4%	1,720 + 8.5%	142 + 0.6%	900 + 4.5%	904 + 3.9%
Wise, Va.	5,719 + 14.3%	4,962 + 10.8%	4,192 + 8.3%	7,759 + 14.1%	3,491 + 5.6%	3,492 + 5.3%
Floyd, Ky.	4,151 + 11.5%	4,159 + 10.4%	3,591 + 8.1%	3,534 + 7.4%	3,436 + 6.7%	3,381 + 6.2%
Johnson, Ky.	3,296 + 18.8%	3,297 + 18.2%	2,207 + 9.2%	2,231 + 8.4%	2,219 + 7.7%	2,255 + 7.3%
Knott, Ky.	2,234 + 15.1%	2,233 + 13.2%	2,081 + 10.9%	2,192 + 10.3%	2,183 + 9.3%	2,178 + 8.5%
Lawrence, Ky.	1,172 + 10.9%	1,182 + 9.9%	692 + 5.3%	691 + 5.0%	668 + 4.6%	646 + 4.3%
Letcher, Ky.	2,690 + 11.6%	2,691 + 10.4%	1,579 + 5.5%	1,503 + 5.0%	1,428 + 4.5%	1,338 + 4.0%
Magoffin, Ky.	1,697 + 16.3%	1,697 + 13.9%	833 + 6.0%	1,018 + 7.0%	1,023 + 6.5%	966 + 5.7%
Morgan, Ky.	635 + 6.3%	634 + 5.9%	593 + 5.3%	626 + 5.2%	609 + 4.8%	587 + 4.4%
Pike, Ky.	10,701 + 17.5%	10,704 + 14.9%	6,848 + 8.3%	6,826 + 7.6%	6,676 + 6.9%	6,442 + 6.2%
L.F.W.E.A.	37,582 + 14.4%	35,516 + 11.5%	27,496 + 7.9%	28,336 + 7.6%	24,520 + 6.0%	23,943 + 5.6%
Virginia	+ 7.1%	+ 6.0%	+ 6.1%	+ 5.8%	+ 4.5%	+ 4.3%
Kentucky	+ 5.3%	+ 5.1%	+ 5.2%	+ 5.0%	+ 4.7%	+ 4.4%

Source: Department of Commerce, Bureau of the Census. Commonwealth of Virginia, Department of Planning and Budget. University of Louisville, Urban Studies Center, Population Research Unit.

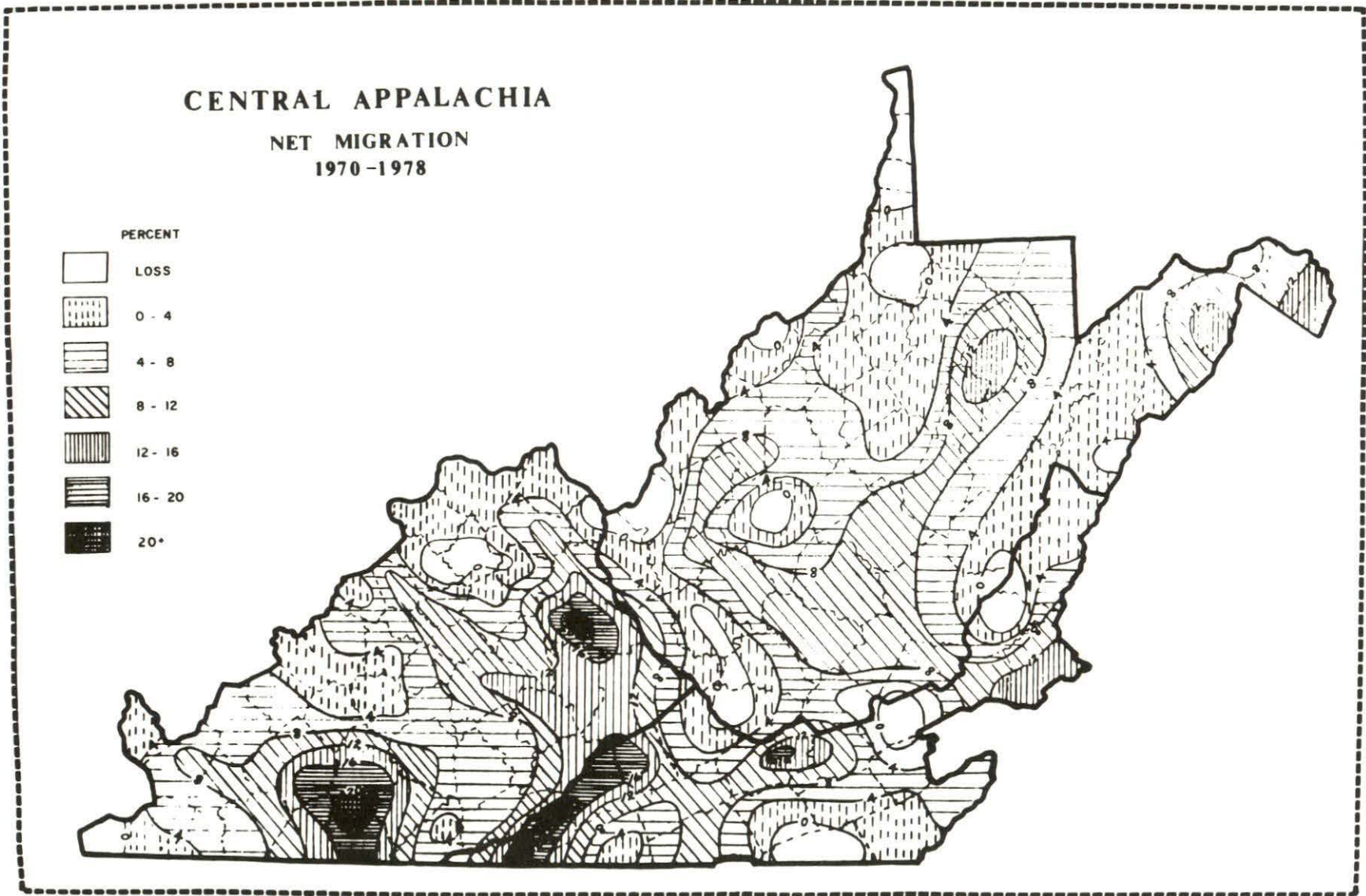


Figure 4. Central Appalachia Net Migration, 1970-1977

In a recent study of population change in Eastern Kentucky, an attempt was made to analyze some of the variables that could influence rates of population change (Cox, 1979). The change in coal production yielded a rather low correlation coefficient of .394 when paired against population change by county. Obviously other factors are important. In this study it has been concluded that the rapid growth of population since 1970 was related to a number of diverse factors, including increased coal production, increased transfer payments from various agencies and pension plans, a decline of opportunities for employment outside the region, a general nationwide movement back toward rural areas, and the decay of urban environments. Most important of all is a belief that the coal industry faces a bright future which is about to begin.

Population Characteristics

The L.F.W.E.A. population is largely rural; no major cities are located within or contiguous to the drainage basin. In 1970, the U.S. Census classified only 8 percent of the total population of 271,805 as urban—a percentage far below the national average of almost 70 percent. Although most of the basin's population is classified as rural, the classification is in some ways a misnomer, because most residents are actually non-farm rural. While most inhabitants do not live in cities or towns, a high percentage live in dense settlement clusters or ribbons along the creeks of the Levisa's main stem. These clusters often approach urban densities without urban service availability. Overall population density is well above state and national levels (Table 6). The 1980 density for the L.F.W.E.A. is 74 per square mile, compared to 73 in the lower 48 states. Density in the Levisa Fork Basin is 100.4 per square mile. In some ways, the population of the basin has characteristics similar to state and national populations; in other ways, it is quite distinctive. A general demographic comparison is provided in Table 7; Table 8 further refines it.

The population pyramid in Figure 5 graphically illustrates the age-sex population structure. Males comprise 49.4 percent of the basin's population. This is essentially the same as the state and national ratios. The median age of the population is slowly rising but is still lower than both state and national averages. This is indicative of the higher birth rate. Table 9 provides comparative data on birth rates for 1970 and 1975. The average L.F.W.E.A. crude birth rate (births per 1,000 people) in 1975 was 19.6, while Kentucky's was 16.1, Virginia was 14.1, and the national rate was below the replacement level at 14.8. Within the basin, birth rates varied widely from a low of 14.4 in Lawrence County to a remarkable high of 23.2 in Magoffin County. No attempt has been made to explain this wide range between parts of a relatively small, homogeneous region, although the reasons are apparently complex.

A comparison of birth rates between 1970 and 1975 discloses an interesting difference between trends in the basin and at state and national levels. While birth rates in the non-Appalachian portions of the two states and the nation as a whole were falling sharply, the average of birth rates in the L.F.W.E.A. remained relatively unchanged. Here again, a wide range of differences exists within the basin. Lawrence County, Kentucky, and Buchanan County, Virginia, closely followed the average state and national trends, while six of the counties experienced an increase over 1970 rates.

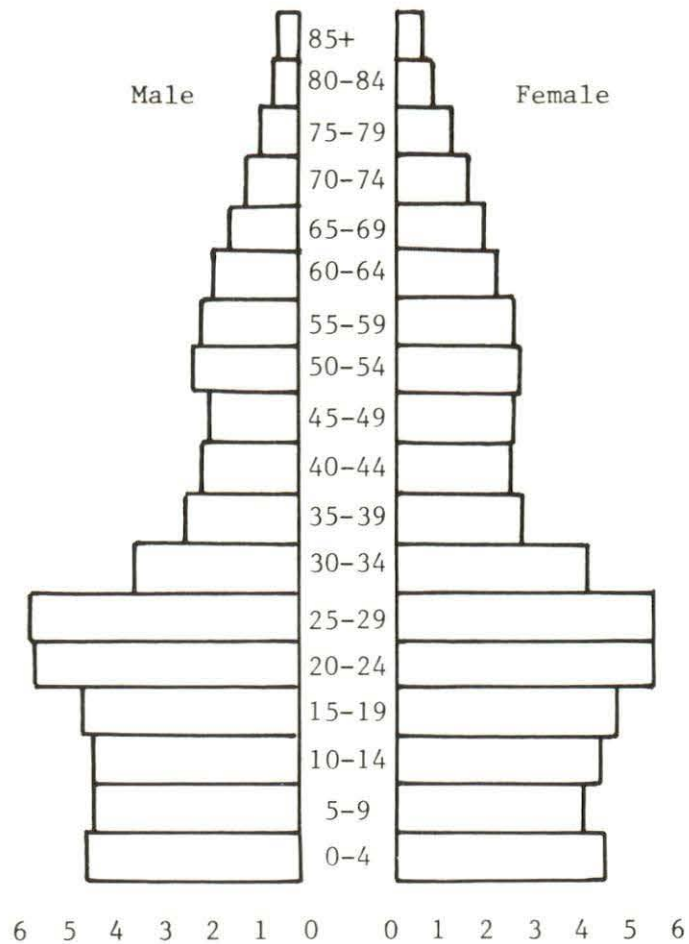


Figure 5. Population Age-Sex Pyramid, 1980.

Source: Based on estimates by Brockway, James and Sager, Thomas. *How Many Kentuckians: Population Forecasts, 1970-2020, the 1979 Update*. Louisville: University of Louisville Urban Studies Center, 1979. Cumberland Plateau Planning District, Lebanon, Virginia. LENOWISCO Planning District, Duffield, Virginia.

**Table 6. Population Density
1970-1980**

County	Population 1970	Density 1970	Population 1980	Density 1980	% of Change 1970-1980
Buchanan, Va.	32,071	63	37,989	75	19
Dickenson, Va.	16,077	48	19,806	60	24
Wise, Va.	35,947	87	43,863	106	22
Floyd, Ky.	35,889	90	48,764	122	36
Johnson, Ky.	17,539	66	24,432	93	40
Knott, Ky.	14,698	41	17,940	50	23
Lawrence, Ky.	10,726	25	14,121	33	33
Letcher, Ky.	23,165	68	30,687	91	33
Magoffin, Ky.	10,443	34	13,515	45	31
Morgan, Ky.	10,019	27	12,103	33	21
Pike, Ky.	61,059	78	81,123	104	33
L.F.W.E.A.	267,633	59	344,343	74	29

Sources: Based on statistics from U.S. Department of Commerce, Bureau of the Census. *Census of Population*, 1970 and 1980. Washington, D.C.: Bureau of the Census.

**Table 7. Population Characteristics
L.F.W.E.A., Kentucky, Virginia and United States
1970**

Area	Population Percent Rural	Density per Square Mile	Median Age (Years)
L.F.W.E.A.	92.2	59	26.7
Kentucky	47.7	81	27.7
Virginia	37.0	117	27.0
United States	26.5	57	28.3

Source: U.S. Department of Commerce, Bureau of the Census. 1970. *Census of Population*. Washington, D.C.: Bureau of the Census.

**Table 8. Population Characteristics
L.F.W.E.A. Counties
1970**

County	Population	% Rural	% Non-White	Density (Per Sq. Mile)	Sex (% Male)	Median Age	AGE		
							Under 18 Years	18-64	65 +
Buchanan, Va.	32,071	100.0	0.2	63	50.2	22.7	42.5%	51.9%	5.6%
Dickenson, Va.	16,077	100.0	0.7	48	49.6	26.1	38.9%	52.6%	8.5%
Wise, Va.	35,947	80.9	2.2	87	48.5	28.4	35.6%	53.9%	10.5%
Floyd, Ky.	35,889	90.5	0.5	90	49.4	27.2	36.9%	53.3%	9.8%
Johnson, Ky.	17,539	78.0	0.0	66	49.1	31.4	33.2%	54.0%	12.8%
Knott, Ky.	14,698	100.0	0.8	41	50.1	24.0	40.6%	49.6%	9.8%
Lawrence, Ky.	10,726	100.0	0.3	25	49.5	31.7	34.4%	50.8%	14.8%
Letcher, Ky.	23,165	89.2	1.9	68	48.9	27.5	38.4%	51.1%	10.5%
Magoffin, Ky.	10,443	100.0	0.1	34	49.5	23.9	41.8%	47.4%	10.8%
Morgan, Ky.	10,019	100.0	0.2	27	50.2	29.5	37.1%	49.9%	13.0%
Pike, Ky.	61,059	92.5	0.7	78	49.2	25.9	38.7%	52.4%	8.9%
L.F.W.E.A.	267,633	92.2	0.8	59	49.4	26.7	38.1%	52.2%	9.7%
Kentucky	-----	47.7	7.3	81	49.0	27.7	34.8%	54.7%	10.5%
Virginia	-----	37.0	19.0	117	49.4	27.0	34.3%	57.8%	7.9%
U.S.	-----	26.5	---	57	48.7	28.3	34.4%	55.7%	9.9%

Source: U.S. Department of Commerce, Bureau of the Census. 1970. *Census of Population*. Washington, D.C.: Bureau of the Census.

**Table 9. Birth Rates
1970-1975**

Area	(1970) Birth Rate	(1975) Birth Rate	(1970-75) Change	Deviation from National Mean
Buchanan, Va.	22.6	19.1	- 3.5	4.3
Dickenson, Va.	16.7	17.0	+ 0.3	2.2
Wise, Va.	20.3	18.7	- 1.6	3.9
Virginia	18.6	14.1	- 4.5	- .7
Floyd, Ky.	19.1	19.8	+ 0.7	5.0
Johnson, Ky.	16.4	16.3	- 0.1	3.7
Knott, Ky.	17.0	17.3	+ 0.3	2.5
Lawrence, Ky.	18.5	14.4	- 4.1	- .4
Letcher, Ky.	20.6	22.4	+ 1.8	7.6
Magoffin, Ky.	19.7	23.2	+ 3.5	8.4
Morgan, Ky.	16.8	20.7	+ 3.9	5.9
Pike, Ky.	19.6	20.0	+ 0.4	5.4
Kentucky	18.7	16.1	- 2.6	1.3
L.F.W.E.A.	20.0	19.6	- 0.4	4.8
U.S.A.	18.4	14.8	- 3.6	N/A

Source: U.S. Department of Commerce, Bureau of the Census. 1970. *Census of Population*. Washington, D.C.: Bureau of the Census.

The mortality rate for the L.F.W.E.A. in 1975 was very close to the average for the nation. Table 10 gives the death rates for the basin by county for 1970 and 1975. Rates dropped in each county during the five-year interim period, reflecting better medical care and improved living standards. Variations between counties is much wider than could reasonably be expected. Mortality rates range from a low of 6.6 per 1,000 in Magoffin County to a high of 12.9 in Lawrence County. The reasons for this wide range are difficult to explain. It is apparently not related to the general level of economic well-being, since the lowest rate occurred in Magoffin, one of the poorest in the basin.

Table 10. Mortality Rates

County	Death Rate 1970 (Per 1,000)	Death Rate 1975 (Per 1,000)
Buchanan, Va.	8.4	7.6
Dickenson, Va.	8.8	8.3
Wise, Va.	11.3	10.8
Floyd, Ky.	10.9	9.7
Johnson, Ky.	12.1	11.0
Knott, Ky.	9.0	7.7
Lawrence, Ky.	13.4	12.9
Letcher, Ky.	10.7	10.4
Magoffin, Ky.	7.9	6.6
Morgan, Ky.	10.6	10.4
Pike, Ky.	9.3	8.4
L.F.W.E.A.	10.4	9.6

Source: U.S. Department of Commerce, Bureau of the Census. *City and County Data Book, 1976*. Washington, D.C.: Bureau of the Census.

One of the more important socio-economic variables in a population is the dependency ratio—the number of dependent people in relation to the number in the productive years between the age of 20 and 64. Dependency ratios were computed for each of the counties of the basin (Table 11).

The old-age dependency ratio of 20.33 is only slightly higher than Kentucky's ratio of 19.97. However, the youth dependency ratio in the basin is well above the state average, 69.12 vs. 61.41. A more significant measure is the total dependency ratio which is 89.45 in the L.F.W.E.A. and only 81.3 in the state of Kentucky. The average for the basin is 7.5 percent higher than for the whole state of Kentucky. Both state and basin ratios are considerably higher than the national ratio.

Table 11. Dependency Ratio

County	Youth (Under 20)	Old Age (Over 64)	Total Dependency Ratio
Buchanan, Va.	76.80	15.30	92.10
Dickenson, Va.	76.80	15.25	92.05
Wise, Va.	68.99	20.30	82.50
Floyd, Ky.	61.80	18.23	81.60
Johnson, Ky.	56.70	20.10	76.70
Knott, Ky.	64.60	18.00	82.60
Lawrence, Ky.	61.20	23.95	85.15
Letcher, Ky.	74.20	19.16	93.30
Magoffin, Ky.	74.20	19.16	93.30
Morgan, Ky.	64.50	26.00	90.50
Pike, Ky.	62.30	15.60	77.90
L.F.W.E.A.	69.12	20.33	89.45

Sources: Brockway, James and Sager, Thomas. *How Many Kentuckians: Population Forecasts, 1970-2020, the 1979 Update*. Louisville: University of Louisville Urban Studies Center.

Cumberland Plateau Planning District, Lebanon, Virginia.

LENOWISCO Planning District, Duffield, Virginia.

Note: Dependency ratios were calculated using the following formula:

Number of people age 20-64 divided by number of people in dependent age group multiplied by 100 = dependency ratio.

Another socio-economic characteristic of a population significant in the analysis of a region is the percentage of the population receiving transfer payments. Table 12 presents the number of people who received Aid to Families with Dependent Children (A.F.D.C.) payments and Supplemental Security Income payments in 1976. Table 13 gives the number receiving Social Security payments. As indicated in the tables, 10.64 percent of the basin's population receive public assistance payments and another 21.64 percent receive payments from Social Security. Almost one-third of the population is being supported entirely or in part by government transfer payments.

No attempt has been made to determine the number receiving other sources of transfer payments, but a sizeable number of people are retirees from the railroads, the military, and state teacher's retirement systems, and private pension funds that are not tied to Social Security. At any given time, a significant percentage of the population is receiving unemployment compensation. The number of people receiving monthly food stamp allotments is distressingly high. In total, the number of people in the basin receiving all or part of their support from transfer payments presents a gloomy picture, but one that is hopefully improving.

**Table 12. Recipients of Public Assistance
1976**

County	Population (1975)	A.F.D.C.	Supplemental Security Income	Total Public Assistance	% of Population
Buchanan, Va.	34,582	1,651	657	2,308	6.63
Dickenson, Va.	18,381	843	556	1,399	7.50
Wise, Va.	45,300	1,060	1,368	2,428	5.36
Floyd, Ky.	40,100	2,985	1,427	4,412	11.00
Johnson, Ky.	20,500	1,841	995	2,836	13.83
Knott, Ky.	16,800	2,628	982	3,610	21.49
Lawrence, Ky.	12,100	855	712	1,567	13.00
Letcher, Ky.	26,600	2,827	1,099	3,926	14.76
Magoffin, Ky.	11,400	2,387	852	3,239	28.41
Morgan, Ky.	10,500	1,371	799	2,170	20.67
Pike, Ky.	68,800	2,819	1,801	4,620	6.72
L.F.W.E.A.	305,603	11,248	11,248	32,515	10.64

Sources: Department of Commerce, Bureau of the Census. LENOWISCO Planning District. Cumberland Plateau Planning District.

**Table 13. Recipients of Social Security
1976**

County	Individuals	Percent of Population
Buchanan, Va.	6,421	18.57
Dickenson, Va.	4,103	22.32
Wise, Va.	10,692	25.68
Floyd, Ky.	9,565	23.85
Johnson, Ky.	4,427	21.60
Knott, Ky.	2,988	17.79
Letcher, Ky.	6,039	22.70
Magoffin, Ky.	2,093	18.36
Morgan, Ky.	2,072	19.73
Pike, Ky.	14,291	20.77
L.F.W.E.A.	65,216	21.64

Source: U.S. Department of Commerce, Bureau of the Census. *City and County Data Book, 1976*. Washington, D.C.: Bureau of the Census.

Population Trends

As noted elsewhere in this report, the Levisa Fork Basin experienced explosive population growth during the decade of the 1970s, regaining much of the population it lost during the disastrous decline of the two previous decades. This amazing reversal no doubt reflects the changing economic climate of Central Appalachia and the Levisa Fork Basin in particular. Coal is recapturing from competing fuels its share of the nation's energy market. The demand for coal, especially low sulfur coal of the type found in Eastern Kentucky, is almost certain to continue to grow in the foreseeable future, and could double in the next decade. Coal continues to dominate the economy of the basin, and population change is closely associated with the status of the economy. Barring unforeseen circumstances, the upward spiral of population growth is expected to continue through the remainder of this century and well beyond. Tables 4 and 5 give the projected changes in population numbers and the rate of change for the individual counties of the basin. The population of the basin is expected to grow from its present level of approximately 345,000 to 400,855 by 1990 and to 449,340 by the end of this century. While some slowing from the explosive growth of the last decade appears inevitable, the pace of population growth should remain well above state and national averages.

In actual numbers, this translates into expected population increases in the 11 counties of the L.F.W.E.A. of 55,832 in the decade of the 1980s and 48,513 during the 1990s, or a whopping 104,345 in the last two decades of this century.

Recent developments in the global energy situation suggest that these estimates may prove conservative. Providing adequate housing, services, and living space for this increase will present a tremendous challenge to the people of the Levisa Fork Basin.

Community Cohesion

Introduction

Few people in North America are as poorly understood by their peers in the rest of the country as the inhabitants of Central Appalachia in general and Eastern Kentucky specifically. A great deal of romantic nonsense has been written about them, much of it based on little more than a vivid imagination. As Carol Crowe-Carraco in her recent book, *The Big Sandy*, has so succinctly stated, "the area and its people have been praised, damned, and lamented as economists, dialectologists, journalists, sociologists, and historians have microscopically examined them" (Crowe-Carraco, 1979).

Most of the differences reputed to distinguish Kentucky hill people from other Americans have been greatly exaggerated. Modern systems of transportation and communication have broken isolation. The modern residents of the Levisa Fork Valley listen to the same radio and T.V. programs as other Americans. They read the same *Courier-Journal* that is read in Louisville. Modern highways make it possible for residents of the valley to shop in Lexington, Cincinnati, or the tri-city area of Huntington, Ashland, and Ironton.

The differences that distinguish them from other Kentuckians or other Americans are little more than nuances. In reality, residents of the Big Sandy are Americans—no more and no less (Miller, 1976). University of Kentucky sociologist Thomas R. Ford has observed that Appalachians have adopted goals and standards of American society. In short, they have become progressive-minded and achievement-oriented (Ford, 1967).

No peculiar sub-culture exists today in the Levisa Fork Basin. However, this does not imply that there are no differences between the Appalachian highlanders of Kentucky and other Americans. Some of these differences should be noted. Included are homogeneity, cultural origins, and environmental influences.

Homogeneity

The Levisa Fork Drainage Basin has a homogeneous population that contains few significant cultural differences. Ethnic minority within the 11-county economic area are largely conspicuous by their absence (Table 14). Blacks comprise only 0.7 of 1 percent of the population. Only Wise County, Virginia, and Letcher County, Kentucky, have a significant number. The black population makes up only 3.4 percent and 1.8 percent of their respective populations.

People of foreign stock constitute an even smaller proportion—just 0.5 of 1 percent.

The great majority of the population is native-born Caucasian with a common, shared heritage that is probably unique to Central Appalachia. The term "white, Anglo-Saxon, protestant" may not be entirely descriptive, but it fits the population of the Levisa Fork Basin as well as any similar-size group in America today. Family names common to the 11-county study area reveal a North European ancestry. They are overwhelmingly protestant with a majority adhering to fundamentalist denominations of the fire-and-brimstone, hell-for-certain variety.

**Table 14. Minority Groups
1980**

County	Total Population	% Black	% Foreign Stock
Buchanan, Va	37,989	.1	.2
Dickenson, Va.	19,806	.6	.7
Wise, Va.	43,863	3.4	1.0
Floyd, Ky.	48,764	.5	.3
Johnson, Ky.	24,432	(z)	.2
Knott, Ky.	17,940	.8	.1
Lawrence, Ky.	14,121	.3	.5
Letcher, Ky.	30,687	1.8	.6
Magoffin, Ky.	13,515	.0	.1
Morgan, Ky.	12,103	(z)	.4
Pike, Ky.	81,123	.7	.5
L.F.W.E.A.	344,343	.7	.5

(z) = Less than .1

Source: U.S. Department of Commerce, Bureau of the Census. 1980. *Census of Population*. Washington, D.C.: Bureau of the Census.

Cultural Origins

Most inhabitants of the study area are descendants of the early settlers who entered the valley between 1790 and 1850 (McClure, 1933). The early settlement occurred as part of the general westward movement after the American Revolution. It has often been suggested that Southeastern Kentucky was the last section of the state to be settled and was settled by a less ambitious, less venturesome people than other frontier areas (Caudill, 1963, 1978). The first part of this suggestion is only partly correct, and the rest is unsupportable. There were several unsuccessful attempts to settle on the Levisa Fork during the 1780s. Because the Big Sandy Valley was a major Shawnee route, successful settlement proved difficult until the Shawnees' power was finally broken in 1794.

The contention that the Levisa Fork Basin and other areas of Eastern Kentucky were settled by "riff-raff" of the American frontier is a discredited theory that should finally be laid to rest. Numerous works by capable scholars have demonstrated beyond reasonable doubt that the people who settled in the river valleys and creek bottoms of the Big Sandy region were no different from those who settled elsewhere in Kentucky and the Midwest (Campbell, 1921; Day, 1949; Caruso, 1959; McClure, 1933).

It should be pointed out that the initial settlers of the basin did not settle in the narrow v-shaped valleys at the heads of the hollows but were attracted to the broader valleys along the river and its larger tributaries. The attractions that brought them to the area are obvious—fertile bottom lands for farming, numerous springs of both fresh and salt water, plenty of game for hunting, abundant timber of high quality, and a bountiful mast for fattening livestock. It is an injustice to a frugal, determined, and capable people to suggest that they were any less successful, ambitious, or energetic than those who made their homes in the more open country to the west of the highlands.

The origins of the people who settled the valley have been reasonably well documented (Campbell, 1921; Caruso, 1959). They came to the Big Sandy region from a population reservoir that built up in the Piedmont of Virginia and North Carolina prior to and during the American Revolution. The composition of this group is well known. They were Scotch-Irish, English, German, French Huguenot, and small elements of various other North European peoples. The Scotch-Irish and English probably made up the largest share of this population reservoir that was to settle Kentucky and much of the rest of the American frontier. Any cultural differences between the various groups was inconsequential, since they had mingled and intermixed for two generations prior to their arrival in the Big Sandy Valley. If today's residents of the Levisa Fork Basin are different from other Kentuckians, it is because of events that have shaped their lives since the area was settled.

Environmental Influences

From the time of the American Civil War to the present, elements of the physical, social, and economic environment of the Levisa Fork Basin have helped to mold five successive generations of Eastern Kentuckians into a homogeneous population. The initial settlement period was over before the 1850s. Land suitable for agriculture had been fully occupied, and little additional migration into the region occurred until the first coal boom at the beginning of the twentieth century.

Elsewhere, the frontier moved relentlessly westward. In most places frontier conditions were a temporary phenomenon—a necessary phase in the sequential development of a place (Caudill, 1963). Along the Levisa Fork and its tributaries, frontier conditions became the accepted norms. The same splendid isolation that had offered the early settlers a degree of protection worked to perpetuate a frontier society long after it had moved far beyond Kentucky.

The maturely dissected Cumberland Plateau, with its deeply entrenched narrow, twisting valleys and steep-sided meandering ridges, made road building difficult and expensive. Movement in and out of the basin, while not impossible, was not easy. The main stem of the Levisa Fork was navigable by canoe, raft, push-boat, and small steamboat during winter and spring, but the tributaries were not. Overland movement was even more difficult and time consuming. Although the Kentucky Legislature in 1802 provided for a road to be built from the Bluegrass section through Mt. Sterling and Prestonsburg to connect with a Virginia road at Pound Gap, very little actual construction was ever done (Crowe-Carraco, 1979).

Habitable land in the Levisa Fork Basin is not continuous even along the river. Instead, it is composed of many small ribbons and pockets of arable land along the river, the larger creeks, and some of the coves at the heads of larger hollows. The land absorbed the early population like a sponge, effectively isolating families and clans from the outside world and from their neighbors within the basin itself. Extended family groups often existed in semi-isolation dependent upon their own resources for survival. Until the end of the nineteenth century, the isolation of the upper valley and the tributaries continued. A uniform population became even more homogeneous. Kinship linkages are extensive and complex, with a surprisingly large segment of the population related in some way. Many of the same family names occur repeatedly from the headwater areas in Virginia to the mouth of the Levisa at Louisa.

Beginning about 1870 the Levisa Fork Valley entered a period of rapid change. A series of economic booms and busts followed, which changed forever the independent, self-reliant life style of the region's people. The first of these was the logging era that lasted from about 1870 until the end of the century.

At the beginning of the twentieth century, a spectacular coal boom spread through the basin. An almost insatiable demand for railroad workers, crop cutters, and coal miners concentrated tens of thousands of people in teeming ribbons of settlement along the creeks and hollows of the coal-rich areas. The boom continued almost without interruption for three decades of unprecedented growth (Cox, 1979). The arrival of railroads, the construction of mining camps and service centers, and the explosive expansion of industrial employment shattered traditional patterns of livelihood and behavior. It forced the inhabitants of the basin to alter their habits and make new adjustments and responses. Few residents of the area were left untouched by the changes (Eller, 1976).

The Great Depression abruptly terminated the boom in 1929. During the next few years the non-Appalachian elements that had arrived with the boom departed, leaving behind a population almost as homogeneous as the one that had existed in the basin before the coal mining period.

World War II ushered in the second great coal boom of this century, but no substantial additional growth through in-migration. There was an ample supply of workers left over from the previous boom. A second factor

became significant during this period—a growing stream of Appalachian migrants heading for Dayton, Detroit, Middletown, and a dozen other northern and midwestern cities. During the 1940s their numbers were hardly missed since the relatively high birth rate continuously renewed the population of the basin. However, they were setting the stage and establishing the migration routes for the “Great Exodus” which was to follow shortly.

Between 1948 and 1950, events occurred simultaneously which were to set in motion one of the two great interregional migrations in modern U.S. history. The automation of mining, the loss of much of the coal market to cheap residual oil and natural gas, the introduction of the light-weight chain saw in logging, and the precipitous decline of Appalachian agriculture due to midwestern competition made much of the labor force of the Levisa Fork Basin redundant.

The loss of population was almost instantaneous as a flood of displaced highlanders poured out of the basin and neighboring areas. The region of which the Levisa Fork is a vital part slipped quickly into a numbing depression that continued unabated through the 1950s and much of the decade of the 1960s. Many of the work force found themselves out of work with little hope of ever again finding gainful employment in their home area. So they fled their stranded communities in an exodus of human misery that made the migration of “Okies” to California pale in comparison. For almost two decades this painful readjustment to a reduced economic base continued. During this period of readjustment, the 11 counties suffered population losses ranging from 20 percent to more than 30 percent of their total populations. The loss of young adults, including some of the most ambitious and talented, was staggering, as the more mobile elements of the population departed for the cities or sought refuge in the armed forces (Cox, 1980).

In the closing years of the decade of the 1960s, the flood of refugees from the basin slowed to a trickle, and by the end of the decade a slow recovery had begun to reverse the flow of migration. The oil embargo of 1973 and the ensuing “energy crisis” sent the Levisa Fork Basin spinning into another coal boom that has since ebbed a bit. It has also brought the first significant migration into the region in three decades. Who these migrants are and how they will affect the cohesiveness of the communities of the basin are questions yet to be answered. Research in this area is just beginning (Polley, 1979; Walker, 1978).

The net effect of all the complex forces that have formed and shaped the people and the economy of the basin has been to create a remarkably uniform and cohesive population. A major positive factor beginning to emerge is a sense of regional pride in being a part of this place, especially among the youth.

Education

Introduction

Since the early years of settlement, education, or the lack of it, has been a problem for the people of Appalachia. Although there are indications that the original inhabitants may have been a literate people, it was a trait they failed to pass on to their offspring. Education did not have a high priority on the frontier. Conditions in Appalachia made education more difficult than in most other areas. A sparse population dispersed in more or less isolated and inaccessible pockets amplified the problems of assembling enough children at one spot for a school. Local funding was almost never adequate for the support of education, and the Appalachian counties were all but ignored by their respective states until well into the twentieth century. This regrettable legacy from the past still plagues the region today. It is a problem not confined to the Levisa Fork Basin or to Eastern Kentucky but exists in varying degrees throughout the Appalachian highland region.

Interesting comparisons may be made between the Levisa Fork Basin, the Appalachian region, and the United States in terms of educational attainment.

Education Levels

In all the counties of the L.F.W.E.A., the levels of education as measured by school years completed fall below state and national levels (Table 15). In the nation, of all persons 25 years of age or older, 52.3 percent have graduated from high school, and 10.7 percent have completed at least four years of college. This is well below the percentages for the state of Kentucky as a whole, and Kentucky ranks near the bottom among the 50 states. Even in the Appalachian Region, as defined by the Appalachian Regional Commission, 44 percent of persons 25 years old have completed high school. In 1970 in the counties of the basin, average educational attainment for adults was four years behind the country.

An even more distressing statistic deals with the percentage of people who have completed less than five years of school. The L.F.W.E.A. average of 18.8 percent is far different from the national percentage of only 5.5 percent. Doubly disturbing is that this five-year measurement essentially marks the level of functional literacy. The low level of education almost certainly contributes to the basin's economic difficulties.

Educational Facilities

While the funding of education in the region in the past was generally inadequate despite the tremendous wealth generated by the coal industry, steps have been taken in Kentucky and Virginia to remedy the situation. Much of the funding is now provided at the state level, and schools are being brought up to state standards. The quality of education still varies some between counties, but the gap is closing.

In addition to the regular elementary and high schools, the Levisa Fork Basin has 11 vocational technical schools, four junior or community colleges, and three four-year colleges. Improved highways place the L.F.W.E.A. within commuting distance of the regional universities at Marshall, Morehead, and Eastern Kentucky. Morehead State University also maintains off-campus study centers at Pikeville and Prestonsburg.

**Table 15. Education Levels
Persons 25 Years Old and Older
1970**

Area	School Years Completed			
	Median	Less Than 5 Yrs.	4 Yrs. High School Or More	4 Yrs. College Or More
Buchanan, Va.	7.0	24.8%	19.9%	2.9%
Dickenson, Va.	7.0	18.6%	20.1%	3.1%
Wise, Va.	8.1	17.1%	23.9%	4.1%
Virginia	11.7	7.7%	47.8%	12.3%
Floyd, Ky.	8.4	18.9%	24.5%	4.2%
Johnson, Ky.	8.5	15.5%	25.2%	4.5%
Knott, Ky.	8.2	22.8%	18.8%	4.9%
Lawrence, Ky.	8.5	17.3%	23.2%	3.8%
Letcher, Ky.	8.4	18.8%	19.3%	3.1%
Magoffin, Ky.	8.4	14.5%	17.5%	2.5%
Morgan, Ky.	8.4	15.9%	20.5%	4.8%
Pike, Ky.	8.4	18.8%	23.4%	4.1%
Kentucky	9.9	9.4%	38.5%	7.2%
L.F.W.E.A.	8.1	18.8%	22.9%	3.9%
U.S.A.	12.1	5.5%	52.3%	10.7%

Source: U.S. Department of Commerce, Bureau of the Census. 1970. *Census of Population*. Washington, D.C.: Bureau of the Census.

Economy/Employment/Labor Force

Economy

Coal has dominated the economy of the L.F.W.E.A. since the beginning of large-scale mining operations early in this century. In spite of the tremendous stream of economically valuable coal that has poured out of the area during the last 80 years, the people who live there have not prospered in proportion to the wealth they have helped to provide. There is no better evidence of the truth of that statement than the findings of an Appalachian Regional Commission study of socio-economic deficiencies in Appalachia (Pickard, 1974). The counties of the L.F.W.E.A., along with the other coal-mining counties in Eastern Kentucky, generally ranked near the bottom. The reasons for this situation are complex and difficult to explain. Numerous studies and reports by economists, sociologists, and other social scientists have pointed to absentee ownership of resources and mining operations, ineffective mining laws and regulations, and exploitation of land and people as being the major causes contributing to the economic difficulties of the region. Some observers of Appalachian development insist that the region has become an internal energy colony of the American economy (Caudill, 1976; Nyden, 1977; Lewis, 1978; Weller, 1978; Woodruff, 1973).

Regardless of the causes, it remains an inescapable fact that coal has been, and still is, king in the regional economy. As a result, the economy of the Levisa Fork Basin is tied closely to the fortunes of the coal industry which has led the area through a series of exhilarating booms and heart-breaking busts.

The characteristics of mining, at least as practiced in Appalachia, lead to a one-industry economy with little development that is not in some way related to, or at least dependent on, the extraction of minerals. Except for wages paid to workers and local taxes paid to the county, coal mining offers little long-term benefit. Unlike manufacturing, where materials are fabricated or made into something of greater value, the production of coal adds little value to the product and therefore does little to stimulate other economic development.

Absentee ownership of minerals and production facilities guarantees that the profits generated by a great and vital industry leave the area. Although the ownership of minerals in the L.F.W.E.A. has not been documented by a systematic, thorough study, it is estimated that at least 80 percent of the basin's coal resources belong to people and corporations outside the region (Kirby, 1969, and Walls, 1969).

Although the infrastructure is being assembled which may help to diversify the regional economy in the long run, coal is still the volatile master of the present. Changes in the demand for coal, even seasonal changes, can stimulate or depress the entire economy of the basin and the coal producing region.

Table 16 gives some indication of the relative importance of coal to the economy of the L.F.W.E.A. Bituminous coal production in the 11 counties exceeds 73,000,000 tons annually. Approximately 45,000,000 tons of this is actually produced within the L.F.B. This is high-quality, low-sulfur coal that commands a premium price. Conservatively, the value of L.F.W.E.A. production annually exceeds 1.1 billion dollars.

**Table 16. Bituminous Coal Production
1976**

County	Underground Production (Tons)	L.F.W.E.A. Surface Production	Total Production	Underground Production	L.F.B. Surface Production	Total Production
Buchanan, Va.	11,584,000	4,220,000	15,804,000	9,093,440	3,354,900	12,448,340
Dickenson, Va.	3,791,000	1,508,000	5,299,000	3,734,135	1,485,380	5,219,515
Wise, Va.	5,599,000	6,691,000	12,290,000	1,629,310	1,947,080	3,576,390
Floyd, Ky.	2,213,000	2,335,000	4,548,000	2,213,000	2,335,000	4,548,000
Johnson, Ky.	248,000	3,477,000	3,725,000	210,300	2,948,490	3,158,790
Knott, Ky.	2,788,000	1,583,000	4,371,000	797,370	452,740	1,250,110
Lawrence, Ky.	-----	1,163,000	1,163,000	-----	276,790	276,790
Letcher, Ky.	2,833,000	1,283,000	4,116,000	158,650	71,850	230,500
Magoffin, Ky.	71,000	2,177,000	2,249,000	5,820	178,500	184,320
Morgan, Ky.	-----	604,000	604,000	-----	52,550	52,550
Pike, Ky.	14,220,000	4,782,000	19,002,000	10,673,530	3,589,400	14,262,930
TOTAL	43,347,000	29,823,000	73,170,000	28,515,555	16,692,680	45,208,235

Source: U.S. Department of the Interior, Bureau of Mines. *Mineral Industries Yearbook. 1977.* Washington, D.C.: U.S. Bureau of Mines.

With production expected to double during the next decade, the impact of coal on the basin's economic and social structure will be tremendous. Changes in the world energy situation forecast a good future for coal during the rest of this century, and it can be predicted that the basin's economy will continue to follow the fortunes of coal in general. However, efforts must be made to diversify the regional economy. Coal will not last forever, and one needs only to look at a mining community where the mines no longer work to realize the danger of dependence on a single industry.

There are various estimates of remaining coal reserves in Eastern Kentucky, ranging from 12 billion tons to several times that amount. Certainly enough coal remains to sustain projected production rates for several decades. The future of the L.F.W.E.A. may be determined by what happens during this period. A former county judge in one of the counties a few years ago made a statement that hopefully will not become a prophecy: "This county has two industries—coal and welfare. Someday it will have only one."

Overall economic conditions in the counties of the basin lag well behind the averages for the state and nation. By almost every measure of economic well-being on which statistics are gathered, all the counties are substandard. Although some progress has been made in closing the gap since 1970, regional incomes, housing, living conditions, and essential services reflect the continuing inability of the coal-based economy to provide a reasonable living standard for the majority of the people of the basin.

Per-capita and family incomes are two of the best measures of the socio-economic level of an area. If incomes are adequate over an extended period, most of the other conditions will improve. Table 17 provides a comparison of L.F.W.E.A. economic levels with the state of Kentucky and the United States in 1969. The average per-capita income in the study area was only 51.8 percent of the average for the U.S. A disturbingly high 35 percent of the population fell below the low income level compared to only 10.7 percent for the entire country.

A more detailed break-down of income levels is provided in Table 18. At the time of the 1970 census, 39.6 percent of the population in the L.F.W.E.A. fell below the poverty level designated by the U.S. government. While the number of people in this category was distressing in all the counties of the basin, reflecting the low overall level of the regional economy, three counties had 50 percent or more of their populations living under poverty conditions.

The recovery of the coal industry during the late 1960s and early 1970s, especially with the developing energy crisis that followed the Arab oil embargo in 1973, was quickly reflected in the area's economy. By 1974 the Levisa Fork valley was in the midst of an economic boom. Incomes rose dramatically from the depressed levels of just a few years before. Table 19 reflects the changes in local, regional, and national income levels from 1969 through 1979. The entire Appalachian region showed a more rapid increase than the average for the nation—an increase of 192.9 percent vs. 180.8 percent. At the same time, per-capita income in the L.F.W.E.A. expanded by a phenomenal 284.2 percent in only 10 years.

Even with this increase, the economic level of the study area remained far below the average for the nation. The average per-capita income in the 11-county area stood at only 70.6 percent of the national average at the end of 1979. Also, the variation between counties remained as wide as ever, ranging from a low of 50.9 percent of the national average in Morgan County

**Table 17. Income Levels
1969**

Area	Median Family Income	Per Capita Money Income	Families Below Low Income Level	Families With Income of \$15,000 Or More
Buchanan, Va.	\$6,188	\$1,716	27.2%	5.2%
Dickenson, Va.	\$5,035	\$1,492	34.0%	2.1%
Wise, Va.	\$5,875	\$1,828	27.4%	5.4%
Virginia	\$9,044	\$2,996	12.4%	19.8%
Floyd, Ky.	\$4,878	\$1,632	34.9%	4.4%
Johnson, Ky.	\$4,287	\$1,615	38.3%	5.4%
Knott, Ky.	\$3,278	\$1,161	56.4%	3.9%
Lawrence, Ky.	\$4,185	\$1,605	40.0%	3.9%
Letcher, Ky.	\$4,406	\$1,496	40.0%	3.3%
Magoffin, Ky.	\$3,664	\$1,266	48.9%	4.5%
Morgan, Ky.	\$3,658	\$1,339	43.3%	2.4%
Pike, Ky.	\$5,429	\$1,695	31.8%	4.7%
Kentucky	\$7,439	\$2,425	19.3%	11.6%
L.F.W.E.A.	\$5,014	\$1,609	35.1%	4.4%
U.S.A.	\$9,586	\$3,119	10.7%	20.6%

Source: U.S. Department of Commerce, Bureau of the Census, 1970. *Census of Population*. Washington, D.C.: Bureau of the Census.

**Table 18. Distribution of Income
1970**

Civilian Labor Force Annual Income	Buchanan County	Dickenson County	Wise County	Floyd County	Johnson County	Knott County	Lawrence County	Letcher County	Magoffin County	Morgan County	Pike County	L.F.W.E.A.
Less than \$1000	354	264	535	545	368	343	272	419	379	285	950	6.9%
\$1000-\$2999	1,301	932	1,647	2,198	1,321	1,258	876	1,672	701	850	3,338	23.6%
\$3000-\$4999	1,278	844	1,747	1,960	1,057	652	455	1,265	475	540	2,863	19.3%
\$5000-\$6999	1,539	601	1,576	1,354	735	388	391	831	294	305	2,564	15.5%
\$7000-\$8999	1,206	680	1,395	1,255	450	348	371	685	269	244	2,361	13.6%
\$9000-\$9999	435	233	525	402	137	122	80	270	51	71	883	4.7%
\$10,000-11,999	741	235	727	604	253	101	171	332	136	146	1,053	6.6%
\$12,000-\$14,999	520	242	618	485	204	101	203	284	94	120	782	5.4%
\$15,000-\$24,999	350	64	390	306	237	116	92	142	95	52	557	3.5%
\$25,000-\$49,999	54	14	86	75	15	20	21	49	8	6	110	0.7%
\$50,000 or more	0	7	21	22	5	0	0	6	10	5	63	0.2%
% of population with income below poverty level	30.5%	38.3%	31.3%	40.6%	43.2%	62.6%	45.0%	44.2%	53.1%	50.0%	35.7%	39.6%

Source: U.S. Department of Commerce, Bureau of the Census. 1970. *Census of Population*. Washington, D.C.: Bureau of the Census.

**Table 19. Changes In Per Capita Income
1969-1979**

County	Per Capita Income 1969	% of U.S. Average	Per Capita Income 1979	% of U.S. Average	% Change 1969-1979
Buchanan, Va.	1,716	55.0	7817	89.3	355.5
Dickenson, Va.	1,879	60.2	6340	72.4	237.4
Wise, Va.	1,828	58.6	8101	92.5	343.2
Floyd, Ky.	1,633	52.4	6106	69.7	273.9
Johnson, Ky.	2,238	71.8	6679	76.3	198.4
Knott, Ky.	1,161	37.2	4830	55.2	316.0
Lawrence, Ky.	1,605	51.5	5707	65.2	255.6
Letcher, Ky.	1,496	48.0	5945	67.9	297.4
Magoffin, Ky.	1,266	40.6	4680	53.4	269.7
Morgan, Ky.	1,339	42.9	4458	50.9	232.9
Pike, Ky.	1,695	54.3	7337	83.8	332.9
L.F.W.E.A.	1,609	51.6	6182	70.6	284.2
Central Appalachia	1,824	58.5	6249	71.4	141.6
Appalachian Region	2,505	80.3	7336	83.8	192.9
United States	3,119	100.0	8757	100.0	180.8

Source: U.S. Department of Commerce, Bureau of Economic Analysis.

to 89.3 percent in Buchanan County. A significant contributing factor in the relatively low averages for the region is the small proportion of the total population in the labor force (see Table 20). This aspect of the region is discussed in more detail in a following section.

The economy of the L.F.W.E.A. continued to expand from 1975 to 1979 at somewhat reduced rates. It has since ebbed considerably, due, at least in part, to a developing recession in the national economy. However, there are favorable indications that this period of economic expansion in the Levisa Fork Basin, despite temporary lulls, is sustainable as long as the coal lasts and/or the nation is dependent on a fossil fuel energy.

Properly managed, the valley's coal resources could make the Levisa Fork a land of promise; without planning and proper management, this area could become a valley of despair.

Employment and Labor Force

Basic information on employment characteristics and labor force are presented in Table 21. The importance of mining as the major employer is obvious in the major coal-producing counties. Overall mining accounted for 28.6 percent of employment in the L.F.W.E.A. Mining was relatively insignificant as an employer in only two counties—Lawrence and Morgan. Both of these lie primarily outside the drainage basin of the Levisa Fork. Manufacturing was a major source of employment in only three of the counties. Following mining, the various agencies of government in total provide the most important source of employment. Approximately 22 percent of the population of the L.F.W.E.A. is employed by governmental agencies.

The total civilian labor force of only 69,176 in a population of 267,633 was much lower than expected. Table 20 presents the percentage of total population in the labor force by county as well as for the region. Only 32.8 percent of the population was considered to be a part of the labor force. In this case, labor force is interpreted to include only employed persons and those actively seeking employment.

For Kentucky as a whole, 43.3 percent of the total population is in the labor force. The L.F.W.E.A. rate of about three-fourths the rate for Kentucky is highly significant.

Of the 11 counties, none had a labor force participation higher than 30 percent. In Magoffin County the rate was a shocking 17.4 percent. The low percentages of people in the labor force suggest that large numbers of people are dependent, or are supported by transfer payments. Tables 12 and 13 indicate the number of people receiving public assistance, and social security payments are high.

The number of women in the labor force was well below state and national averages. More than anything else, this can be attributed to the nature of the area's economy. A coal-based economy is strongly male-oriented. Although women in increasing numbers are being hired as mining employees, there is still too much truth in an observation made by an American geographer that "in a mining community there are few jobs for women, and none for ladies (Hart, 1975)."

As disturbing as the low percentage of population in the labor force might appear, a more insidious statistic is the percentage of population in the prime working ages of 20-64 who are not in the labor force for one reason or another. The percentages of working age people in the labor force and not in the labor force are presented in Table 22. Using 1970 census

Table 20. Percentage of Population in the Labor Force

County	Total Population	Total Civilian Labor Force	% of Population in Labor Force
Buchanan, Va.	37,989	14,262	37.54
Dickenson, Va.	19,806	5,371	27.12
Wise, Va.	43,863	19,218	43.81
Floyd, Ky.	48,764	14,273	29.27
Johnson, Ky.	24,432	8,482	34.72
Knott, Ky.	17,940	4,533	25.27
Lawrence, Ky.	14,121	3,751	26.56
Letcher, Ky.	30,687	7,209	23.49
Magoffin, Ky.	13,515	4,861	35.97
Morgan, Ky.	12,103	4,992	41.25
Pike, Ky.	81,123	29,506	36.37
L.F.W.E.A.	344,343	116,458	32.85

Source: U.S. Department of Commerce, Bureau of the Census. 1970. *Census of Population*. Washington, D.C.: Bureau of the Census.

U.S. Department of Labor, Bureau of Labor Statistics.

Table 21. Employment Characteristics

County	Total Civilian Labor Force	Civilian Labor Force % Unemployed	Civilian Labor Force % Female	Civilian Labor Force % Mining	Civilian Labor Force % Manufacturing	Civilian Labor Force % Construction
Buchanan, Va.	8,637	4.3	23.4	47.5	6.5	5.8
Dickenson, Va.	3,706	7.4	22.0	40.6	6.8	7.0
Wise, Va.	10,570	4.4	30.0	26.5	8.3	7.4
Floyd, Ky.	9,498	9.8	32.7	20.3	9.6	10.5
Johnson, Ky.	4,851	6.1	34.9	12.2	10.2	11.6
Knott, Ky.	3,102	9.0	31.3	18.4	5.0	13.6
Lawrence, Ky.	2,781	6.0	28.6	3.9	20.6	11.3
Letcher, Ky.	5,347	4.7	24.1	41.4	4.6	5.1
Magoffin, Ky.	1,819	11.5	27.5	13.8	6.8	15.8
Morgan, Ky.	2,695	7.2	29.8	3.3	17.2	12.6
Pike, Ky.	16,170	6.6	26.9	34.4	4.2	7.5
L.F.W.E.A.	69,176	6.5	28.2	28.6	7.7	8.6
Kentucky	-----	4.6	36.2	2.4	25.6	7.0
Virginia	-----	3.0	39.5	0.9	22.4	7.4
U.S.A.	-----	4.4	38.0	----	25.9	6.0

Source: U.S. Department of Commerce, Bureau of the Census. 1970. *Census of Population*. Washington, D.C.: Bureau of the Census.

statistics, it was calculated that 49.9 percent of the potential working age population was working or actively seeking employment. Obviously about half (50.1%) of the people in prime working ages were not employed or were no longer seeking employment. Some of this large number are disabled or unable to work for a number of reasons; however, many are employable, and for various reasons have dropped out of the labor force.

The modern coal industry is highly automated and requires skilled workers. Many of the people in the L.F.W.E.A. obviously cannot meet the requirements or are not needed by a dynamic and changing industry. In the absence of alternative lines of employment, many apparently drop out of the labor force or never choose to enter it.

The economy of the Levisa Fork Basin has experienced rapid growth since 1970, and many of the assumptions based on data from the last census may no longer be valid. However, there are indications that little has changed in terms of percentages employed, unemployed, or participating in the labor force. The number of people employed has expanded (prior to current recession) by approximately 25 percent, but so has the total population.

Data compiled by the Appalachian Regional Commission indicate that unemployment in the L.F.W.E.A. declined from 6.5 percent to 6.0 percent between 1970 and 1977. However, the rate has again increased from 1977 to the present. The number of women employed in the coal industry has increased, but still accounts for little more than 1.5 percent of the work force.

If the problems outlined above are to be solved, a more diversified economy is essential to provide alternatives to mining and to smooth out the rapid fluctuations brought on by a mono-cultural economy. Since 1970 the L.F.W.E.A. has actually lost a net of two major manufacturing plants.

**Table 22. Population Age 20-64
Not In The Labor Force
1970**

County	No. of People in Work Force (a)	% of Working Age Population	No. of People Not in Work Force (b)	% of Working Age Population
Buchanan, Va.	8,637	52.7	7,751	47.3
Dickenson, Va.	3,706	35.9	6,622	64.1
Wise, Va.	10,570	46.4	12,222	53.6
Floyd, Ky.	9,498	53.6	8,209	46.4
Johnson, Ky.	4,851	54.9	3,990	45.1
Knott, Ky.	3,102	46.4	3,588	53.6
Lawrence, Ky.	2,781	54.5	2,325	45.5
Letcher, Ky.	5,347	47.9	5,822	52.1
Magoffin, Ky.	1,819	38.9	2,860	61.1
Morgan, Ky.	2,696	56.9	2,042	43.1
Pike, Ky.	16,170	53.6	14,016	46.4
L.F.W.E.A.	69,177	49.9	69,447	50.1

Source: (a) U.S. Department of Commerce, Bureau of the Census. 1970. *Census of Population*. Washington, D.C.: Bureau of the Census.
(b) Derived from Census data.

Housing

Introduction

A frequently asked question about the L.F.W.E.A. in any discussion of further rapid expansion of the coal-based economy and a concomitant increase in population is, "Where will the people live?" This is not a frivolous question. A serious housing shortage already exists in the major coal production areas of the basin. It is exacerbated by the influx of returnees and new arrivals, a dearth of usable land for housing, the reluctance of many lending institutions to loan money at all for housing on the available sites, and by the condition of existing housing. In some areas the housing situation is so serious that it could serve as an impediment to significantly expanding coal production.

The Present Housing Situation

Housing characteristics are frequently used as an indication of socio-economic well-being. At the present time in the L.F.W.E.A. this is probably not a good indicator. Many people who could afford to pay for better housing have been unable to find it or build it. This is especially true of young coal miners who work at highly paid jobs but are forced to live in sub-standard housing because nothing else is available.

A general overview of the housing situation as it existed before the latest boom in coal production is provided by Tables 23 and 24. An apparent contradiction in the two tables concerning the number of housing units resulted from enumerating all year-around units in Table 23 and only occupied units in Table 24. In 1970 there were 83,889 housing units in the 11-county statistical area. Ninety-one percent of those units were occupied. Information in the two tables presents an overall indication of the value and condition of the area's housing when compared to state and national averages. Average value per unit was only 48 percent of the average for Kentucky and only about 35 percent of the average value for houses in the U.S. Houses in the L.F.W.E.A. were also smaller, older, and had slightly more people living in them than the state and national averages.

A more detailed measure of the comparative quality of housing in the 11 counties of L.F.W.E.A. is provided by Table 25. Quality of housing is often indicated by the availability of plumbing facilities within the structure. Thirty-nine percent of all housing units lacked some or all plumbing facilities. While this was somewhat better than the average for all of Eastern Kentucky (48.7%) it was far below the national average of 5.5 percent. The study area came off poorly on all measures of housing quality except the number of homes with food freezers. In this category it exceeded the state and nation.

After the Arab oil embargo and the expansion of the coal industry, heavy immigration created a huge demand for housing. As thousands of people migrated into the basin, the housing situation became critical. Unable to find suitable housing, thousands of people purchased mobile homes. Table 26 indicated the extent of the demand for new housing units during the decade of the 1970s. Approximately 21,300 units were required to meet the demand created by population growth. This estimate does not include replacement housing which added several thousand more units.

**Table 23. Housing General
1970**

Area	Total Year-A-Round Units (a)	Change 1960-1970 (a)	Median Number of Rooms (a)	Av. Number Of Persons Per Occupied Unit
Buchanan, Va.	8,973	+ 6.4%	4.7	3.8
Dickenson, Va.	5,056	- 0.4%	4.7	3.5
Wise, Va.	11,512	- 3.0%	4.9	3.3
Floyd, Ky.	11,382	+ 7.2%	4.9	3.4
Johnson, Ky.	6,023	+ 4.3%	5.1	3.2
Knott, Ky.	4,343	+ 2.8%	4.7	3.8
Lawrence, Ky.	3,919	+ 7.9%	5.1	3.2
Magoffin, Ky.	3,080	+ 7.3%	5.0	3.7
Morgan, Ky.	3,313	+ 3.4%	5.2	3.3
Pike, Ky.	18,699	+ 4.4%	4.7	3.5
L.F.W.E.A.	83,889	+ 3.0%	4.8	3.5
Kentucky	-----	+ 16.2%	4.9	3.2
Virginia	-----	+ 29.1%	5.2	3.3
U.S.A.	-----	+ 19.9%	5.0	3.2

(a) = Total year-a-round units does not include seasonal and migratory units.

Source: U.S. Department of Commerce, Bureau of the Census. 1970. *Census of Housing*. Washington, D.C.: Bureau of the Census.

**Table 24. Housing Values
1970**

Area	Total Number Occupied Units	Year-A-Round Units Built Since 1960	Median Value, Owner Occupied	Median Monthly Rent, Renter Occupied
Buchanan, Va.	8,372	25.6%	\$7,188	\$47
Dickenson, Va.	4,526	18.6%	\$6,650	\$44
Wise, Va.	10,639	16.6%	\$6,626	\$58
Floyd, Ky.	10,329	17.5%	\$5,379	\$50
Johnson, Ky.	5,423	18.9%	\$6,395	\$57
Knott, Ky.	3,859	19.8%	\$4,683	\$30
Lawrence, Ky.	3,293	15.5%	\$8,809	\$65
Letcher, Ky.	6,808	11.9%	\$4,029	\$39
Magoffin, Ky.	2,802	18.9%	\$5,650	\$41
Morgan, Ky.	2,953	22.8%	\$9,348	\$61
Pike, Ky.	17,335	19.1%	\$5,773	\$53
L.F.W.E.A.	76,339	18.5%	\$6,144	\$50
Kentucky	-----	25.1%	\$12,830	\$83
Virginia	-----	31.5%	\$17,366	\$116
U.S.A.	-----	25.0%	\$17,130	\$110

Source: U.S. Department of Commerce, Bureau of the Census. 1970. *Census of Housing*. Washington, D.C.: Bureau of the Census.

Table 25. Housing Facilities
1970

County	Occupied Units 1.01 Or More Persons Per Room						
	Lacking Some Or All Plumbing Facilities	Total	With All Plumbing Facilities	With Air Conditioning	With Food Freezer	With Telephone	With 1 Or More Autos
Buchanan, Va.	40.4%	20.4%	32.5%	8.3%	32.2%	55.6%	76.7%
Dickenson, Va.	42.4%	17.8%	35.6%	4.4%	41.1%	68.0%	74.3%
Wise, Va.	31.7%	13.8%	40.5%	4.7%	24.2%	72.7%	73.5%
Floyd, Ky.	34.1%	17.0%	31.2%	16.7%	37.9%	59.0%	73.7%
Johnson, Ky.	35.3%	11.1%	29.9%	17.6%	32.2%	69.2%	70.2%
Knott, Ky.	56.1%	24.1%	21.0%	5.5%	38.0%	61.1%	71.8%
Lawrence, Ky.	40.1%	9.9%	23.9%	12.7%	28.9%	67.2%	70.7%
Letcher, Ky.	48.1%	16.8%	23.6%	6.8%	39.7%	57.4%	71.5%
Magoffin, Ky.	51.1%	20.0%	27.5%	10.5%	50.2%	51.3%	71.3%
Morgan, Ky.	45.2%	14.1%	33.6%	9.7%	43.4%	66.9%	72.7%
Pike, Ky.	35.5%	17.9%	36.4%	11.9%	32.2%	61.0%	74.5%
L.F.W.E.A.	39.0%	16.8%	32.4%	10.2%	34.3%	62.6%	73.4%
Kentucky	18.4%	10.3%	60.9%	34.0%	30.8%	78.4%	80.9%
Virginia	11.6%	7.7%	65.6%	44.8%	29.3%	84.0%	83.2%
U.S.A.	5.5%	8.0%	86.2%	36.7%	28.2%	87.3%	82.5%

Source: U.S. Department of Commerce, Bureau of the Census. 1970. *Census of Housing*. Washington, D.C.: Bureau of the Census.

**Table 26. New Housing Units
Built or Placed From 1970 to 1980**

County	Population Change 1970-1980	New Housing Units
Buchanan, Va.	5,918	1,714
Dickenson, Va.	3,729	1,097
Wise, Va.	3,744	1,101
Floyd, Ky.	12,875	3,787
Johnson, Ky.	6,893	2,027
Knott, Ky.	3,242	954
Lawrence, Ky.	3,395	999
Letcher, Ky.	7,522	2,212
Magoffin, Ky.	3,072	904
Morgan, Ky.	2,084	613
Pike, Ky.	20,064	5,901
L.F.W.E.A.	72,538	21,336

Source: U.S. Department of Commerce, Bureau of the Census. 1980. *Census of Population*. Washington, D.C.: Bureau of the Census.

The Role of Mobile Homes as Alternative Housing

New mobile homes have become a significant cultural feature of the Appalachian landscape. It would be difficult to overestimate the role of this innovation in housing modern residents of the L.F.W.E.A. A careful analysis of aerial photographs of a portion of the valley reveals 228 mobile homes along the Russell Fork and its tributaries between Millard at the mouth of Russell Fork and Elkhorn City, only 12 miles upstream. Almost all of these are located on the flood plain since the hillsides in this rugged area are too steep for terracing. A field reconnaissance of this same area revealed that more than 80 percent of housing installed or constructed since 1970 is of the mobile home variety.

The same situation prevails in varying degrees throughout the Levisa Fork Basin and the entire mining area of Eastern Kentucky. The concentration of mobile homes is particularly heavy on Shelby Creek, where almost all available sites, even on the low-lying flood plain, are occupied by mobile homes. One study of housing in Pike County estimated that more than 85 percent of new housing is of this type.

The proliferation of mobile homes can be attributed to a number of factors. Sites for conventional housing are scarce and expensive. Banks are reluctant to loan money on houses in flood-prone areas, and most usable land is on the flood plain. Mobile homes require less space. They also may be purchased with a much smaller down payment, an important factor for a young family. Also significant is the fact that mobile homes are fully furnished so that house and furniture are financed with a single monthly payment. Finally, mobile homes are actually superior to much of the existing housing in the old coal mining areas.

Projected Housing Needs

If the population of the L.F.W.E.A. expands at the rate projected in Table 4 during the next two decades, the need for new housing will grow at a rate that will place a strain on the basin's land and financial resources. The projected need for new housing to handle anticipated population growth between 1980 and 2000 is presented in Table 27. If we assume that the average household size will remain at approximately 3.4 people, almost 16,500 units of new housing will be needed by 1990 and another 14,293 from 1990 to the year 2000.

Considering the quality of existing housing in the older mining communities, it appears that replacement housing will add significantly to these estimates. If we assume that two percent of the housing in existence in 1970 must be replaced annually, the number of units needed for replacement of dilapidated or worn-out housing will rival the number needed to take care of population growth. This would add more than 15,000 new units per decade to the number projected in Table 27.

The total demand for new and replacement housing is expected to exceed 60,000 units between 1980 and 2000. If present trends continue, mobile homes will still account for much of this increase. Another possibility could be the use of multifamily units instead of the single-unit dwellings Appalachians are accustomed to. In view of the projected changes, a great deal of careful planning and zoning will be necessary if the environment of the Levisa Fork Basin is to remain liveable.

**Table 27. Projected New Housing Units
Needed by 1990 and 2000**

County	New Housing Needed 1980-1990	New Housing Needed 1990-2000
Buchanan, Va.	1,463	1,071
Dickenson, Va.	548	531
Wise, Va.	3,515	2,054
Floyd, Ky.	2,095	2,050
Johnson, Ky.	1,305	1,309
Knott, Ky.	1,257	1,283
Lawrence, Ky.	407	386
Letcher, Ky.	906	814
Magoffin, Ky.	544	585
Morgan, Ky.	356	352
Pike, Ky.	4,022	3,858
L.F.W.E.A.	16,418	14,293

Source: Projected housing needs were calculated by dividing the projected increase in population by the average number of persons per household (3.4). The average number of persons per household was taken from the U.S. Department of Commerce, Bureau of the Census. 1970. *Census of Population* Washington, D.C.: Bureau of the Census.

Services and Utilities

Introduction

One of the measures of the quality of life is the availability of adequate public services and utilities. The nature of the topography and the pattern of creek bottom settlements make the provision of even minimal services difficult and expensive. Depending on the location and the type of service, conditions in the Levisa Fork Basin range from adequate to totally inadequate.

Hospitals and Medical Care

The quality of medical care varies with the size and accessibility of the community. Smaller communities may be without the services of a clinic or even a medical doctor or dentist. Larger towns such as Pikeville or Prestonsburg enjoy a full range of medical care except for highly specialized needs. Hospitals are located in eight of the 11 counties of the L.F.W.E.A. Four counties have at least two hospitals, while Floyd County, Kentucky, and Wise County, Virginia, each have three (Table 28). Wise County, Floyd County, and Pike County serve as regional medical centers. Hospitals in these counties are modern, well-equipped, and have a full complement of physicians with a wide range of specialities. Dickinson County, Virginia, Knott County, Kentucky, and Magoffin County, Kentucky, do not have hospitals, but most residents live within reasonable commuting distance of a hospital. Magoffin County has only a single physician, but it and several other counties have primary or ambulatory care centers and expanded services from local or regional health departments.

Each county in L.F.W.E.A. depends to a degree on hospital and specialized medical services in nearby metropolitan areas, especially Lexington.

Police and Fire Protection

No attempt was made to analyze these services. It was assumed that police protection is adequate in the larger communities and almost totally lacking in the smaller ones. Both Kentucky and Virginia have excellent state police forces that are adequately represented in their respective portions of the basin. They are primarily responsible for highway enforcement, but do additional police work. Also, they serve as backup or supporting systems for local police departments. All counties have a sheriff's department responsible for rural law enforcement. The larger communities have city police forces of varying size and effectiveness.

In most incorporated towns, fire protection is provided by volunteer fire departments. However, most of the region's people reside outside incorporated communities. The distribution of houses and businesses in the region make adequate fire protection difficult and expensive.

Solid Waste Disposal

Solid waste disposal, or the lack of it, presents a very serious problem, especially in the Kentucky portion of the basin. Unauthorized or illegal dumping along the roadsides and stream banks is everywhere a problem

**Table 28. Medical Services
1976**

County	No. of Physicians	Rate per 100,000 People	Hospitals	No. of Beds	Beds per 100,000
Buchanan, Va.	10	28.9	1	94	272
Dickenson, Va.	7	38.1	-	--	--
Wise, Va.	58	139.3	3	200	254
Floyd, Ky.	31	75.8	3	238	582
Johnson, Ky.	15	73.0	1	95	462
Knott, Ky.	3	17.6	-	--	--
Lawrence, Ky.	10	83.5	1	90	752
Letcher, Ky.	19	70.9	2	156	582
Magoffin, Ky.	1	8.6	-	--	--
Morgan, Ky.	4	37.6	1	50	470
Pike, Ky.	38	54.6	2	317	455
TOTALS	196	64.13	14	1,240	406

Source: U.S. Department of Commerce, Bureau of the Census. *City and County Data Book 1976*. Washington, D.C.: Bureau of the Census.

that mars what natural beauty remains. Many residents, even some who reside in expensive new houses, dispose of garbage and trash by throwing it down the creek bank behind the house. This appears to be a time-honored method of disposing of all types of unwanted material, from disposable diapers and Clorox bottles to worn-out automobiles; all go into the streambeds with abandon. Streamside dumping is apparently sanctioned and practiced by a broad spectrum of the population. After a spring flood, streamside bushes are festooned with all manner of throw-away items—plastic bags, toilet tissue, plastic bottles, soft drink containers, and various other items.

A major problem for many residents is access to approved landfills. Of the more than 30 recognized public dumps in the basin, only a few are legal and meet state regulations. In the Kentucky segment of the L.F.W.E.A. four sites were approved as sanitary landfills in the mid-1970s (Kentucky Department for Natural Resources and Environmental Protection). Unavailability and inaccessibility of legal dump sites contributes to the problem of illegal roadside and creekside disposal. An adequate number of state-approved, accessible landfills, tough littering laws, and adequate enforcement appear essential if a liveable environment is to continue in the basin. In the absence of these, it appears that a rapidly expanding, increasingly affluent population is in danger of being literally buried in its own trash.

Sewage Disposal

The disposal of human waste in the Levisa Fork Basin presents a potentially hazardous situation. According to the Kentucky Department for Natural Resources and Environmental Protection, 80 percent of the population of the Kentucky portion of the basin lives outside the limits of any kind of sewer service. A similar situation exists in the headwater areas in Virginia.

Five types of disposal systems are found in the basin. These include municipal sewage treatment plants, privately owned package sewage treatment plants, septic tank systems, raw sewage dumping in streams, and privies or outhouses. On the Levisa Fork and its tributaries, 11 municipalities maintain sewage treatment plants. All of these except the primary treatment plant at Paintsville achieve secondary treatment. In addition to the plant at Paintsville, other municipal sewage treatment plants are located at Prestonsburg, Pikeville, Elkhorn City, Jenkins, Wheelwright, Martin, Caney Creek, Grundy, Pound, and Wise. Most of them also operate well below maximum capacity (Kentucky Department for Natural Resources and Environmental Protection).

In addition to the municipal plants, more than 100 small, privately owned sewage plants are operated by shopping centers, businesses, and mobile home parks. These achieve acceptable treatment by the aeration process.

Most of the remaining population depend on individual household sewage disposal that consists of septic tanks that lead directly into the nearest stream. Three factors combine to impair the effectiveness of septic tank systems in much of the basin—small lot sizes, high water tables, and tight, impervious clay soils. A high percentage of housing is located on the flood plain of the river or one of its tributaries. Frequently the valleys are limited in extent and heavily populated. In most of the strip settlements, housing density may exceed five houses per usable acre, leaving inadequate space for the several hundred feet of leach line required for a

workable septic disposal system. Most of the soils have low percolation rates, and in many of the smaller valleys only a few feet of soil covers an impervious bedrock. In combination, these factors encourage home owners to dispense with the lateral lines and empty their septic tanks directly into the stream.

A large, but undetermined, number of households have inside plumbing but no septic tank. Raw sewage is piped directly into the nearest creek. Some indication of the magnitude of waste disposal can be gained by observing streamside bushes when they are bare of foliage. After a period of high water, an abundance of toilet tissue, along with other trash of different origins, decorates their branches.

Finally, the old-fashioned privy is still very much a part of the cultural landscape. In 1970, 39 percent of houses lacked part or all plumbing facilities (for a county breakdown see Table 25). Many of these privies are located near a stream and not infrequently on the bank of the stream or over the stream. Serious problems exist from raw sewage and septic tank seepage at many places in the L.F.W.E.A. due to heavy concentrations of population in dense ribbons of settlement along the narrow flood plains. Especially serious problem areas have been identified upstream from Paintsville, including Miller Creek, the Left Fork of Beaver Creek below Wheelwright, the Right Fork of Beaver Creek around Wayland, the entire length of Shelby Creek, the Levisa Fork from Pikeville to the mouth of Russell Fork, and Russell Fork from Elkhorn City to its confluence with the Levisa Fork.

Public Water Systems

Water systems have much in common with sewage systems in that they vary a great deal with the size and location of the populated areas. Most incorporated places have adequate systems that meet public health standards. In some smaller communities a local coal company may supply water, but most water is obtained from drilled wells. Since high-yield aquifers are rare, the amount of water available is sometimes a problem.

Most of the population of the basin lies outside the areas served by public water systems. Rural residents obtain water for household use from a number of sources including wells, springs, and, occasionally, abandoned coal mines. The most common source is from drilled wells. In creek valleys where population densities are heavy, an obvious health hazard exists. Inadequate or non-existent sewage systems, combined with shallow wells in close proximity, need no further discussion.

Electricity

The Levisa Fork Basin is well supplied with electric power. Two major electric companies supply electricity to the area. In the Virginia counties, the utility company is Appalachian Power Company, a subsidiary of American Electric Power. The company, one of Virginia's largest utilities, operates a large power plant on the Clinch River and is tied into the national power grid. In the Kentucky portion of the basin, power is supplied by Kentucky Utilities, which has a gigantic generating facility near Louisa. Together these two companies provide adequate and dependable electric power.

Transportation

Introduction

A good transportation system is a major prerequisite for development. Lack of accessibility was a major contributing factor to the economic and social backwardness that plagued the Levisa Fork Basin from the time of settlement until well into the twentieth century. So important is a good transportation network to economic development that much of the Appalachian Regional Commission's developmental program has been transportation oriented. Considerable progress has been made toward the development of adequate transportation facilities in the L.F.W.E.A., but much remains to be done. The status of the existing transportation complex in the basin is summarized below.

Highway Transportation

The L.F.W.E.A. is served by an extensive system of paved roads that penetrate most of the major creeks. However, much of this network consists of narrow, winding two-lane highways that vary a great deal in quality and state of repair. Extensive damage from heavily loaded coal trucks is a basin-wide problem.

The basin is not served by any of the major interstate highway systems, but several of the highways are being brought up to modern standards, including the building of four lanes on the most heavily traveled routes.

U.S. 23, which bisects the valley from Louisa to the mouth of Shelby Creek above Pikeville and then continues up Shelby Creek to Jenkins and on through Pound Gap into Virginia, is the major transportation corridor of the region. At the present time the road is undergoing a major upgrading. When completed, it will be a modern four-lane highway traversing much of the basin. Two major segments of the highway have already been completed, one in Virginia from Pound Gap to Norton, and in Kentucky from Prestonsburg to Pikeville. Other major highways in the basin are U.S. 460, U.S. 119, Kentucky Route 114, and Kentucky Route 80 (presently being rebuilt from near Martin to Hazard).

Portions of the existing highway network are heavily used by large trucks transporting heavy loads of coal to tipples and loading points along the railroads. The recent growth in coal production that has benefitted the basin's economy has adversely affected the transportation network. Due to the relatively small size and the location of many of the area mines, much of the coal is hauled from the mines to loading points by truck. One estimate places the amount of coal moved by truck at over 80 percent (Big Sandy ADD, 1978). The same source estimates that in the Kentucky portion of the basin, only 16 percent of the roads are structurally capable of coal haul traffic.

The majority of the secondary roads are substandard and appear to be deteriorating under the combined impact of heavy traffic and a series of severe winters. According to a report by the Big Sandy Area Development District, the poorly constructed roads are being damaged by trucks carrying loads that far exceed the weight-carrying capacity of the highways (Big Sandy ADD, 1978). Serious overloading of coal trucks is a long standing practice in the coal mining counties of the basin. Furthermore, because of the

importance of coal to the local economy, county and state officials have been less than diligent in enforcing weight regulations.

If coal production reaches anticipated levels (Spaid, 1975), the basin's already over-worked highway network may be stretched beyond its capacity. Doubling production by 1990 is not only a possibility, but in the light of recent developments (discussed elsewhere in this report), is probable. Not only will truck traffic increase, but a substantial growth in adult population will mean more and more automobiles. Upgrading and expanding the area's highway network appears essential, as coal production almost inevitably increases.

Railroad Transportation

The Levisa Fork Basin is served by five major railroad systems. The two major railroads are the Chessie System entering from the north, and the Norfolk and Western entering from the south and east. These two major systems are supplemented by the Louisville and Nashville Railroad from the west, the Southern Railway from the south, and the Clinchfield from the south. These five systems, along with several smaller short lines, extend up the valley and the larger creeks.

The railroads are primarily coal haul roads, although they also provide freight service to the larger towns of the region. No passenger service is provided.

The entire railway will require track improvement and some expansion to meet the very heavy coal-haul demand that is anticipated during the rest of this century. Extension of spurlines to mining areas not presently served and merger of existing lines to drastically reduce the times and distances to major markets will be needed. It is extremely doubtful that the railway system can or will react quickly to the changing needs of the L.F.W.E.A.

Bus Transportation

Limited public transportation is provided the L.F.W.E.A. by scheduled bus lines. The Bristol-Norton Bus Line provides daily service from Bristol, Virginia, through Norton and Pound to Jenkins, Kentucky. This line makes daily connections with the Greyhound Bus Line operating up the Big Sandy and Levisa Fork Valleys. These are the only public carriers transporting passengers in the basin.

Air Transportation

No scheduled air service is available to the Levisa Fork Basin except that which is found at Lexington, Huntington, and Bluefield. At the present time, the L.F.W.E.A. has five small airports with limited facilities. These are located in Morgan County (outside the Levisa Fork Basin near West Liberty), Floyd County (between Paintsville and Prestonsburg), Buchanan County (at Grundy), and Wise County (at Wise). All have paved runways, landing lights, and a radio operator during daytime. All are limited by topography or the lack of need for high volume air traffic. Only Wise Airport, which occupies a strip mine site on the top of a plateau, is large enough to safely handle multi-engine aircraft. Even here, the 4,600-foot runway is lightly used by private and charter aircraft.

Recreation

Introduction

The L.F.W.E.A. offers limited recreational opportunities for its population or for visitors to the basin. Within the basin there are no major sports or recreation complexes, and organized activities are few.

Most of the recreational opportunities are of the outdoor type—hunting, fishing, camping, hiking, boating, swimming, picnicking, and photography. The quality and accessibility of these activities varies a great deal from place to place.

Water-Oriented Recreation

The best facilities for water-related recreation are provided by the four completed Corps of Engineers reservoirs—Dewey, Fishtrap, John W. Flannagan, and North Fork of Pound. Facilities vary from reservoir to reservoir, with Dewey Lake offering the most diverse array of facilities and North Fork of Pound offering the least. Table 29 outlines the facilities afforded by each of the reservoirs and the type of recreation available.

Tables 30 and 31 provide data on the number of visitor days at each of the impoundments and the utilization of the available facilities. The amount of usage appears related more to the accessibility of the reservoir and the kinds of opportunities available than to the size of the reservoir. The relatively large impoundments of Fishtrap and John W. Flannagan enjoy only light to moderate use, due, at least in part, to their remote locations. Dewey Lake, on the other hand, has more usage than the other four combined.

The numbers of visits to Fishtrap and North Fork of Pound have decreased sharply after peaking in 1975. Both have experienced problems from strip mining activity in their watersheds.

In addition to these four reservoirs, a few smaller impoundments in the basin furnish limited recreational opportunities. Most significant, perhaps, are the small lakes at Jenkins, High Knob Recreational Area, and Breaks Interstate Park.

The Levisa Fork and its major tributaries are used for fishing in the less polluted stretches and also provide opportunities for boating and canoeing. The Levisa Fork is still navigable by small boat and canoe from the mouth of Russell Fork to Louisa, although serious pollution problems greatly reduce the recreational value of what could otherwise be a valuable resource.

Hunting

Small game hunting has been a traditional recreational activity in Appalachia. With more than 80 percent of the land in forests, the basin provides numerous opportunities for this activity, especially in the more remote areas. Deer hunting is limited to a few areas in or contiguous to the Jefferson National Forest, near the Dewey Lake Wildlife Management Area, and a few other places.

Table 29. Recreation Facilities

Project	Facilities													Available Recreation		
	Camping With Hookups	Primitive Camping	Hiking Trail	Lake Overlook	Picnic Area	Boat Ramp(s)	Marina	Lodge	Cabins	Swimming Beach	Fishing Access Area	Amphi-Theatre	Playground	Water Skiing	Hunting	Fishing
Dewey	X			X	X	X	X	X	X	X	X	X	X	X	X	X
Fishtrap	X	X		X	X	X				X	X			X	X	X
Flannagan	X	X		X	X	X	X				X		X	X	X	X
North Fork of Pound	X	X	X	X	X	X	X			X	X			(A)	X	X

(A) No water skiing recreation at North Fork of Pound as boating is restricted to "NO WAKE" operation, due to erosion from wave action.

Source: Huntington District Corps of Engineers.

**Table 30. Reservoir Visitation Data
1970-1979**

Year	Dewey	Fishtrap	John W. Flannagan	North Fork of Pound
Jan. thru Sep. 1979	788,187	308,884	323,534	125,123
1978	1,280,687	329,569	369,339	170,496
1977	1,391,322	406,546	481,432	204,696
1975	1,443,761	718,627	448,028	267,188
1974	1,429,605	509,700	480,332	205,014
1973	897,393	409,500	410,287	302,458
1972	1,005,860	492,800	386,052	198,212
1971	1,028,160	430,300	345,850	186,378
1970	2,187,113	376,200	308,212	154,600

Source: Huntington District, Corps of Engineers.

**Table 31. Reservoir Visitation Data
By Type of Use**

Use	Dewey	Fishtrap	John W. Flannagan	North Fork of Pound
Camp	9,357 0.8%	9,429 2.2%	24,775 6.4%	2,503 1.0%
Picnic	113,887 9.2%	20,071 4.7%	56,907 14.7%	39,964 16.6%
Boat	66,982 5.4%	30,155 7.0%	20,691 5.3%	11,663 4.9%
Fish	169,436 13.7%	67,665 15.7%	146,864 37.8%	13,601 5.7%
Hunt	12,172 1.0%	2,079 0.5%	15,758 4.1%	9,357 3.9%
Sightsee	476,833 38.5%	265,102 61.7%	144,539 37.3%	125,916 52.4%
Ski	11,394 0.9%	3,772 0.9%	4,759 1.2%	(a) -0- 0.0%
Swim	181,100 14.6%	20,626 4.8%	10,335 2.7%	26,184 10.9%
Other	197,203 15.9%	10,846 2.5%	3,010 0.8%	11,037 4.6%
1976 TOTAL	1,238,364 100.0%	429,745 100.0%	388,013 100.0%	240,225 100.0%

(a) = Boating restricted to "no wake" operation on North Fork of Pound Reservoir.

Park and Recreation Areas

Two major state parks, Jenny Wiley and Breaks Interstate Park, are popular tourist attractions as well as recreation areas for local residents. Both offer excellent accommodations and facilities for camping, hiking, swimming, and a wide range of other activities.

Breaks Interstate Park is the most scenic area in the Levisa Fork Basin and one of the most scenic in eastern North America. The major attraction is the canyon of the Russell Fork River, sometimes referred to as the "Grand Canyon of the East."

The Jefferson National Forest, occupying portions of Wise, Dickenson, Letcher, and Pike counties, provides numerous recreational activities for outdoor-oriented individuals.

Land Use

Silviculture

Most of the land surface in the L.F.W.E.A. is covered by second or third growth forest. While the amount of land used primarily for forest varies somewhat between different parts of the basin, slightly more than 80 percent of the total area is forested. The amount of forest land has actually increased since about 1940, as large areas (including most steep hillside lands that were once used for pasture or crop production) have been allowed to revegetate. In the humid subtropical climate of the basin the reforestation process is quite rapid. Groves of young tulip poplars mark the coves and lower slopes where corn once grew.

The forest land is presently being greatly underused. Annual growth of wood has been estimated to exceed the cut by at least four to one.

The quality of existing forests varies widely within the basin, ranging from excellent quality second growth hardwoods of marketable size to stands that have been repeatedly culled to the point that remaining timber is almost worthless. Under present harvesting methods, there is little incentive to remove or kill culls, nor is there generally a profitable use for culls and timber of poor quality. It has been estimated that at least one out of every five trees over five inches in diameter is a cull (Parker, 1968).

For the L.F.W.E.A. to receive maximum benefit from its extensive forest lands, proper forestry management is essential. Two factors stand in the way of effective management of this potentially valuable resource. First and probably most important is the fragmented ownership of much of the forest land. While considerable land is under the control of major corporations, most of it is held in tracts of 50 acres or less. The second limiting factor is the attitude of the population toward forests. In some important ways, the residents of the Levisa Fork Basin still have a frontier attitude concerning natural resources.

Urban

The amount of land used for urban development in the L.F.W.E.A. is miniscule compared to the total land area of the basin. Depending on what definition of urban is used, varying amounts of land can be considered urban. If a strict definition of urban place as one having at least 2,500 people is used, the amount of land used is very small—approximately 20 square miles or a little less than 13,000 acres. This is less than 0.5 of 1 percent of the total land area of the 11 counties. If the areas with housing densities that are urban-like are included, the amount of land that could be considered urban is somewhat greater, but does not exceed 1 percent.

When compared to the amount of land that is suitable for urban development, however, the amount of land used for urban purposes takes on an entirely different dimension. Land that is level enough and high enough above the river to be used for crop production, housing, and various urban uses makes up little more than 10 percent of the land in the basin. A seemingly ample man/land ratio of one person for each 8.3 acres is thus reduced to about 0.8 acre per person. When land used for transportation is removed, the ratio is only about 0.6 acre per person. Very little land is available for further expansion without expensive site development and flood protection.

As previously stated, most of the land level enough for effective development is flood prone. Pikeville is in the process of relocating the Levisa Fork in order to create a relatively small amount of usable land by filling in the old river channel (Langmann, 1961). It will also, hopefully, serve the purpose of protecting existing urban and residential developments from future flooding.

The only city in the L.F.W.E.A. that is not restricted by topography and flood hazard is Wise, Virginia. This small city is located on a plateau with ample room for expansion toward the southeast. All the remaining towns of the L.F.W.E.A. are located in valleys and are restricted by either (and in most cases, both) topography or potential flooding. However, it is a foregone conclusion that if the population and economy of the basin develop at projected rates, the service centers must also expand; and that implies additional development on the flood plains of the Levisa Fork and its tributaries. Most of the level or gently sloping land created by past strip mine operations is too inaccessible to present urban places and is, in most cases, near the tops of the hills. With proper preplanning, usable land could be created by mining operations.

Mining

In this land-use category, land that has been significantly disturbed by mining activity, both surface and underground, is included. Also included would be spoil banks, slate dumps, haul roads, sediment and sludge ponds, and coal-processing or loading sites. The amount of land that has been mined or disturbed by mining operations is approximately 6 percent of all the land in the L.F.W.E.A. or about 172,000 acres. The percentage of strip-mined land is highest in Wise County, where strip mining has been practiced continuously since the late 1940s, and lowest in Morgan and Magoffin counties, where large-scale surface mining is a recent activity.

The environmental impact of coal mining has created serious problems in the basin. While underground mining has had some adverse effects on the land, they have been minor compared to the effects of surface mining. The problems associated with surface mining and inadequate or non-existent reclamation have been severe, especially in the upper valley where slopes are steep and rugged. Thousands of acres were mined before reclamation laws were passed and enforced. These areas have aptly been designated "orphan lands." Some of these "orphan lands" are being re-mined with larger, more efficient equipment and are being reclaimed. Other areas have remained as abandoned lands. Most of the areas that were mined in the 1940s and 1950s are now revegetated and are slowly returning to forest.

It appears likely that a great deal more land in the L.F.W.E.A. will be affected directly by mining during the remainder of this century. Although the full impact of the new federal surface mining law has not yet been determined, it is assumed that both deep mining and strip mining will remain important activities in the basin during the foreseeable future.

A recent study at the Massachusetts Institute of Technology presents a highly optimistic view of the future of the coal industry (World Coal Study, 1980). In essence, this report concludes that during the next 20 years coal production must double or even triple, and world trade in coal will have to increase by more than ten-fold. Much of this increase will almost certainly come from the Appalachian coal fields.

The coal of the L.F.W.E.A. is low in sulfur and highly desirable in areas where air pollution is a serious problem. Completion of the Tennessee-Tombigbee waterway should help move coal from the basin to markets not now served. Any possible scenario envisioned results in an increased demand for the high-quality coal of the basin.

The shortage of land for housing and urban development may prove to be a serious obstacle to bringing coal production to the anticipated levels. With proper planning and foresight, it should be possible to convert some of the land used for mining into badly needed land for housing and urban uses.

Agriculture

The 1974 Census of Agriculture indicates that 415,036 acres or 14.4 percent of the land in the L.F.W.E.A. is in farms. However, this greatly overstates the actual situation. Most of the land listed as land in farms is woodland. Agriculture is becoming increasingly insignificant as an economic enterprise or a form of land use in the Levisa Fork Basin, especially the upper basin.

Prior to 1940, semi-subsistence agriculture was widely practiced in the basin. Most rural families kept a few head of livestock, a flock of chickens, and produced enough corn, hay, and vegetables to feed the livestock, and provide a major portion of the food consumed. Even in the densely-settled mining areas, some agriculture was commonly practiced. Between 1940 and 1974, agricultural abandonment reached staggering proportions. According to agricultural statistics compiled by the Bureau of the Census, less than 5 percent of the land in crops in 1940 was still being used for crop production in 1974. The decline was especially severe between 1964 and 1969, when the number of farms decreased by 57.9 percent (Table 32).

In 1974 the Census of Agriculture enumerated 3,268 farms in the 11-county area encompassing the Levisa Fork Watershed Economic Area (Table 33). Most of these were part-time or retirement farms that produced little of commercial value.

Although the average farm size was 127 acres, the amount of cropland harvested per farm averaged only 7.2 acres. Field reconnaissance and a careful stereoscopic review of aerial photographs taken in March 1980 indicate that even this low number exceeds the present situation by a wide margin. Only a few small pockets of agricultural activity exist in the main valley of the Levisa Fork.

Upstream from the town of Louisa in the bottom land along the river are three farms that are being used for commercial agriculture. The principal land use is pasture. From the mouth of George's Creek to Paintsville, no agricultural activity of significance is being practiced. From Louisa to Paintsville, most of the hillsides that were once used as pasture are now growing up in brush. In this entire 34-mile stretch of the Levisa Fork valley only two tobacco and three livestock barns are evident. Most of the usable land in this portion of the valley is devoted to residential use. An amazingly dense ribbon of settlement exists along the roads and creeks where land enough to build on is found. The population is obviously non-farm rural. One could find more agricultural activity in the suburbs of almost any American city.

In the 14-mile stretch from Paintsville to Prestonsburg, agricultural land use is almost non-existent. There are only two small part-time farms along

Table 32. Agriculture

Area	Number Farms	% Change 1964-1969	Percent Farm Population Change 60-70	Average Farm Value X \$1000	Average \$ Value Per Acre	Average Farm Size (Acres)	Leading Farm Product
Buchanan, Va.	281	-34.8	-78.6	15	155	94	Crops
Dickenson, Va.	367	-38.7	-42.9	20	347	57	Crops
Wise, Va.	299	-40.4	-65.5	17	236	73	Crops
Floyd, Ky.	257	-66.5	-55.2	15	120	128	Livestock
Johnson, Ky.	563	-13.0	51.9	11	118	91	Crops
Knott, Ky.	142	-71.1	-89.8	12	127	96	Poultry
Lawrence, Ky.	519	-33.6	-46.0	17	96	174	Poultry
Letcher, Ky.	83	-75.9	-96.3	16	132	124	Poultry
Magoffin, Ky.	661	-35.3	-29.1	14	111	124	Crops
Morgan, Ky.	1,160	-15.7	-29.5	19	153	124	Crops
Pike, Ky.	154	-80.5	-78.8	16	121	131	Livestock
L.F.W.E.A.	4,486	-57.9	-47.3	16	132	114	Crops
Kentucky	---	-6.0	-30.3	32	253	128	Crops
Virginia	---	-19.6	-51.5	47	286	165	Crops
U.S.A.	---	-13.5	-38.3	76	194	389	Livestock

Source: U.S. Department of Commerce, Bureau of the Census, 1970. *Census of Population*. Washington, D.C.: Bureau of the Census.

**Table 33. Agriculture
1974**

County	No. of Farms	Average Size	Cropland Harvested (Acres)	Cropland Harvested Per Farm (Acres)	Farms with Sales Greater Than \$2,000	Commercial Farms with Sales of \$10,000	Percentage Change in No. of Farms (1969-1974)
Buchanan, Va.	113	89	834	7.38	25	2	- 59.8
Dickenson, Va.	114	73	1,216	8.44	22	5	- 60.8
Wise, Va.	167	78	1,512	8.05	34	9	- 60.1
Floyd, Ky.	140	135	903	6.45	17	4	- 45.4
Johnson, Ky.	309	99	2,330	7.54	71	7	- 45.1
Knott, Ky.	29	152	225	7.76	1	0	- 79.1
Lawrence, Ky.	370	191	4,580	12.38	136	24	- 28.7
Letcher, Ky.	50	91	334	6.68	4	1	- 39.8
Magoffin, Ky.	494	139	2,890	5.85	152	11	- 25.3
Morgan, Ky.	861	131	8,172	9.49	421	67	- 25.8
Pike, Ky.	591	143	652	1.10	12	4	- 40.9
L.F.W.E.A.	3,268	127	23,648	7.23	895	134	- 38.6

Source: U.S. Department of Commerce, Bureau of the Census. 1974. *Census of Agriculture*. Washington, D.C.: Bureau of the Census.

this portion of U.S. 23. The flood plain that supported some agriculture two decades ago is being heavily utilized for residential and business purposes.

From Prestonsburg to Pikeville, competing uses for land have all but eliminated agriculture in the main valley. A single farm in the bottom land at the mouth of Beaver Creek composes the total commercial agriculture of this portion of the valley. The land suitable for agriculture has been diverted to other uses, is being held for speculation, or has simply been abandoned as far as agriculture is concerned. Occasionally a few acres are being used as a horse pasture or a small hobby farm. A few of the old farmsteads remain that pre-date the first coal boom. These older houses sit on the high bank of the river, almost invariably facing the river, reflecting the time when the Levisa provided the major artery of transportation. In most cases they are surrounded by buildings of recent construction.

From Pikeville upstream, the valley narrows and provides little opportunity for agriculture. The limited amount of usable land has been pre-empted by residential and other intensive uses.

On most of the major tributaries, the agricultural situation is much the same as on the Levisa Fork itself—conspicuous by its absence. Shelby Creek has no agriculture except one small hobby farm. The same is essentially true for Elkhorn Creek, Pound River, Cranesnest River, McClure River, and Slate Creek.

Several hundred acres of bottom land along Beaver Creek are being used for corn and livestock production. There is also a limited amount of farmland being used on Lower John's Creek and on the plateau around Wise, Virginia.

Other than these few isolated examples, one must conclude that the Levisa Fork is a non-farm rural area. The entire Levisa Fork Watershed Economic Area has a total land area of 2,872,960 acres. Only 23,648 acres of this vast area was being used for crop production in 1974 (Table 33). The rather miniscule amount of cropland in use at that time was slightly more than 0.8 of 1 percent (0.82%) of the total land area (Table 34.). The percentage of crop land harvested in relation to total land area varies considerably from county to county, but is everywhere relatively insignificant. As indicated in this table, the percentage is highest in the northern portion of the basin where the topography is less rugged and the coal industry is less important. Percentages range from almost 3.5 percent in Morgan County to 0.1 percent in Knott County.

Most of the land used for agriculture is in Johnson, Lawrence, Morgan, and Magoffin counties, and much of this is actually outside the Levisa Fork drainage basin in the Licking River basin, Tug Fork basin, or Blaine Creek basin. If only the Levisa Fork drainage basin is considered, then only about 0.5 of 1 percent of the total land area was used for crop production in 1974.

The findings of this study suggest the conclusion that agricultural abandonment from 1974 to 1980 has been at least as rapid as it was during the period from 1969 to 1974 when the number of farms was reduced by 38.6 percent (Table 33).

Residential Land Use

Approximately 26,000 acres of land are used for residential purposes. This constitutes less than 1 percent of the 2,872,960 acres in the L.F.W.E.A. However, as stated elsewhere in this report, the amount of usable land in the basin is limited. In many of the narrow valleys, the only usable land is on the flood plain. Frequently, valleys are so narrow that the creek, the

**Table 34. Cropland Harvested As A Percentage
of All Land
1974**

County	Land Area (Acres)	L.F.W.E.A. Cropland Harvested (Acres)	% Harvested	Land Area (Acres)	L.F.B. Cropland Harvested (Acres)	% Harvested
Buchanan, Va.	325,120	834	0.26	258,534	663	0.26
Dickenson, Va.	212,480	1,216	0.57	209,203	1,197	0.57
Wise, Va.	263,680	1,512	0.57	76,544	439	0.57
Floyd, Ky.	255,360	903	0.35	255,360	903	0.35
Johnson, Ky.	168,960	2,330	1.44	136,960	1,967	1.44
Knott, Ky.	227,840	225	0.10	65,280	64	0.10
Lawrence, Ky.	272,000	4,580	1.70	64,640	1,090	1.70
Letcher, Ky.	216,960	334	0.16	12,160	19	0.16
Magoffin, Ky.	193,920	2,890	1.49	15,904	237	1.49
Morgan, Ky.	236,160	8,172	3.48	20,416	711	3.48
Pike, Ky.	500,480	652	0.13	375,676	489	0.13
L.F.W.E.A.	2,872,960	23,648	0.82	1,490,676	7,779	0.52

Source: U.S. Department of Commerce, Bureau of the Census. 1974. *Census of Agriculture*. Washington, D.C.: Bureau of the Census.

highway, and the railroad occupy most of the flood plain, leaving very little land for other purposes.

Much of the land currently used for housing sites is on the flood plain of the river and its tributaries and is subject to occasional serious flooding. An indication of the seriousness of the flood hazard is the extent of damage to housing and other structures in the basin as a result of the serious flooding that occurred in the spring of 1977 (Department for Natural Resources and Environmental Protection, 1977).

In areas where mining operations have concentrated large numbers of people in narrow stream valleys, the demand for housing sites has raised land prices beyond the reach of many potential home owners. Very little land is available for additional home construction.

If the expectations for greatly increased coal production and related economic development are realized, as now appears likely, a critical shortage of safe, affordable housing sites is almost a certainty.

The anticipated growth in population will require thousands of acres of new land for residential development during the next two decades. There are three alternatives for meeting this demand.

One is to use some of the level or terraced land created by strip mine operations. Properly planned and regulated strip mine operations are capable of producing large areas of level or nearly level land that could be used for housing if access roads were provided. However, the new federal strip mine regulations that require that land be returned to its approximate original contour in most cases are going to make it more difficult to do this.

Another alternative is to use multi-unit dwellings. This would be a radical departure from the traditional single-unit housing pattern L.F.W.E.A. residents are accustomed to. The final alternative is to use the remaining flood plain land in the valleys. In terms of land use, safety, and common sense, this is the least desirable of the three. However, it is also the most likely of the three to be used.

Industrial Land Use

Except for the coal industry and the transportation industry, the industrial development of the L.F.W.E.A. occupies very little space and is insignificant as a major form of land use. The American Standard Plant in Paintsville is the largest factory in the basin. In addition to the American Standard Plant, there are, at any particular time, a dozen or so small sawmills, a few small plants that fabricate, assemble, or repair mining equipment, a major coke oven near Grundy, a couple of low-paying clothing or textile plants, and a few small service industries. The combined land area occupied by all of these would amount to only 100 acres or so.

At the present time, considerable emphasis is being placed on the need to diversify the economic base of the region. It is hoped that new industries can be attracted to the basin. Two major physical problems present serious difficulties to achieving this goal. One is the availability of suitable land. Most of the areas large enough for a modern industrial plant are on the flood plain of the Levisa Fork and are in danger of occasional serious flooding. The second limiting factor is air quality. Frequent temperature inversions occur over the Levisa Fork Basin in late summer and early autumn (see Figure 6). Very few locations in North America have as high an incidence of inversions as the basin. This limits the type of industry capable of meeting air quality standards. Heavy industry and coal gasification plants are not likely candidates for location in the region.

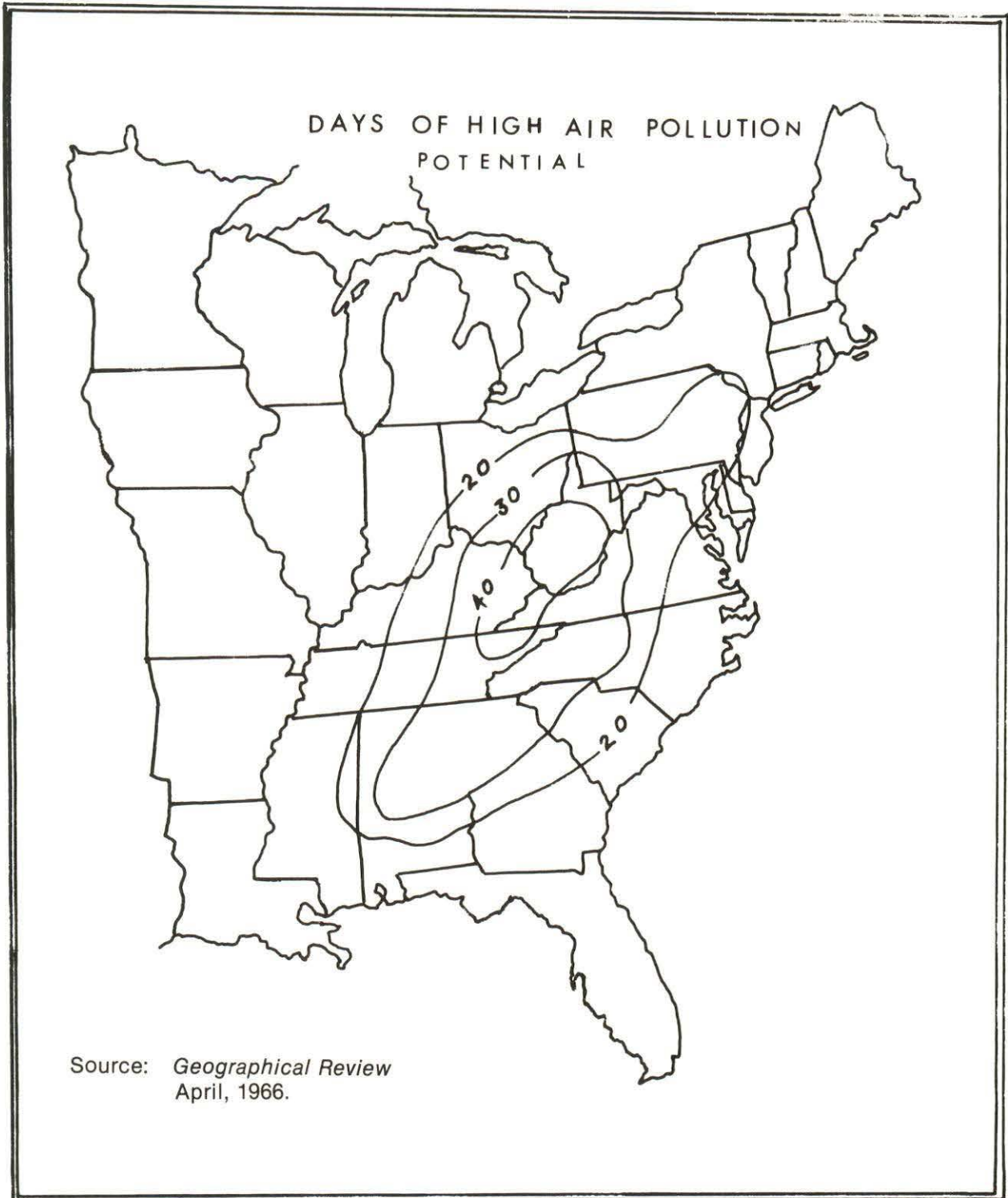


Figure 6. Days of High Pollution Potential.

Summary

After almost two decades of economic decline and heavy loss of population through out-migration during the 1950s and 1960s, the Levisa Fork Basin experienced a remarkable recovery during the 1970s. As the market for coal improved, the coal-based economy of the region experienced a substantial boom that encouraged thousands of people to migrate into the area. Throughout the basin, population expanded at rates exceeding state and national rates by a wide margin. During the decade, the basin's population grew by more than 26 percent.

The population has a cohesiveness that may be unique to the Central Appalachian region. Ethnic minorities are almost nonexistent, and most of the residents share a common cultural heritage that has molded a remarkably homogeneous people. The population is primarily non-farm rural. Only about 8 percent of the total population is classified by the U.S. census as urban. Most of the residents of the basin live in dense ribbons of settlement along the flood plains of the river and its major tributaries.

Despite a revitalized coal industry and significant improvements in the overall economy, the Levisa Fork Basin has continued to lag well behind the rest of the country in almost every measure of economic well being. The dependency ratio is disturbingly high, and almost one-third of the population is supported entirely or in part by transfer payments from various government agencies. Approximately 40 percent of the people have incomes below the poverty level. Only about one-half of the working age population is employed or is actively seeking work. The levels of education in all the counties of the L.F.W.E.A. fall below state and national levels. A serious housing shortage exists, and almost one-third of existing housing is substandard. The basin also has serious deficiencies in services and utilities.

Rapid expansion of the coal industry has adversely affected the transportation system of the L.F.W.E.A. Heavy coal-haul traffic in combination with a series of bad winters has seriously damaged the network of secondary roads. Improvements and expansion of both the highway and railway systems appears necessary if the region is to meet the expected goal for energy production.

Most of the Levisa Fork Basin is rugged hill land unsuitable for agricultural, commercial, industrial, and residential uses. Much of the land that is level enough to be used effectively is located on the flood plains of the river and its tributaries. Usable land is an increasingly scarce commodity. The expanding coal industry and the related increase in population have combined to put tremendous pressure on this limited resource. Agriculture is being pre-empted by competing urban and residential uses of land.

Abandonment of farmland has progressed rapidly since 1964. At the present time very little land is used for crop production. In 1974 only 23,648 acres of land (0.82 percent of the total land area) were used for crop production in the entire L.F.W.E.A. Much of that has been converted to urban and residential uses during the last seven years.

The rapid expansion of population has created a serious housing shortage in the basin. From 1970 to 1980, more than 21,000 new housing units were needed. Much of this need was met by mobile homes. In areas where mining operations have concentrated large populations, the demand for housing sites has raised prices beyond the reach of many potential home owners.

With the anticipated increase in coal production during the remainder of this century, a critical shortage of safe, affordable housing sites appears inevitable. Thousands of acres of new land for residential development will be required if the Levisa Fork is to contribute its share of coal to the nation's energy market. The major limiting factor to the future development of the basin may be a shortage of land on which to build not only housing, but the necessary commercial and industrial establishments.

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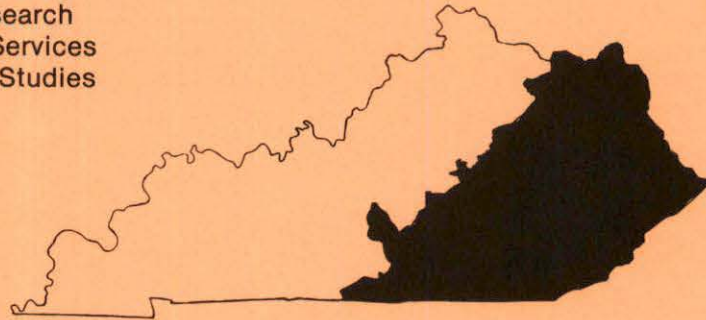
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The Appalachian Development Center was established in 1978 as Morehead State University's regional service arm. Committed to economic, social, and educational development in participation with the people and institutions of Appalachian Kentucky, the Center's major program areas are

Business Development
Regional Research
Community Services
Appalachian Studies



About the Author

Gary C. Cox was born and reared in the Southern Appalachian Mountain area of Pound, Virginia. He earned a B.A. in social sciences from Morehead State College, 1957; an M.A. from Morehead State College, 1961; and a D.A. from the University of Northern Colorado, 1972. He has been at Morehead State University since 1970 and currently is head of the Department of Geography. The 1981-1982 chairman of the geography section of the Kentucky Academy of Science, he has been actively involved in numerous regional research projects, including continuing research dealing with population change in Appalachia; with land-use change in Appalachia; and with the impact of increased mining activity on settlement patterns in Eastern Kentucky. He has published numerous articles in regional and professional magazines and journals and has contributed an earlier study to the Appalachian Development Center Research Report Series—*An Analysis of Population Changes in Eastern Kentucky 1970-2000*, 1979.

