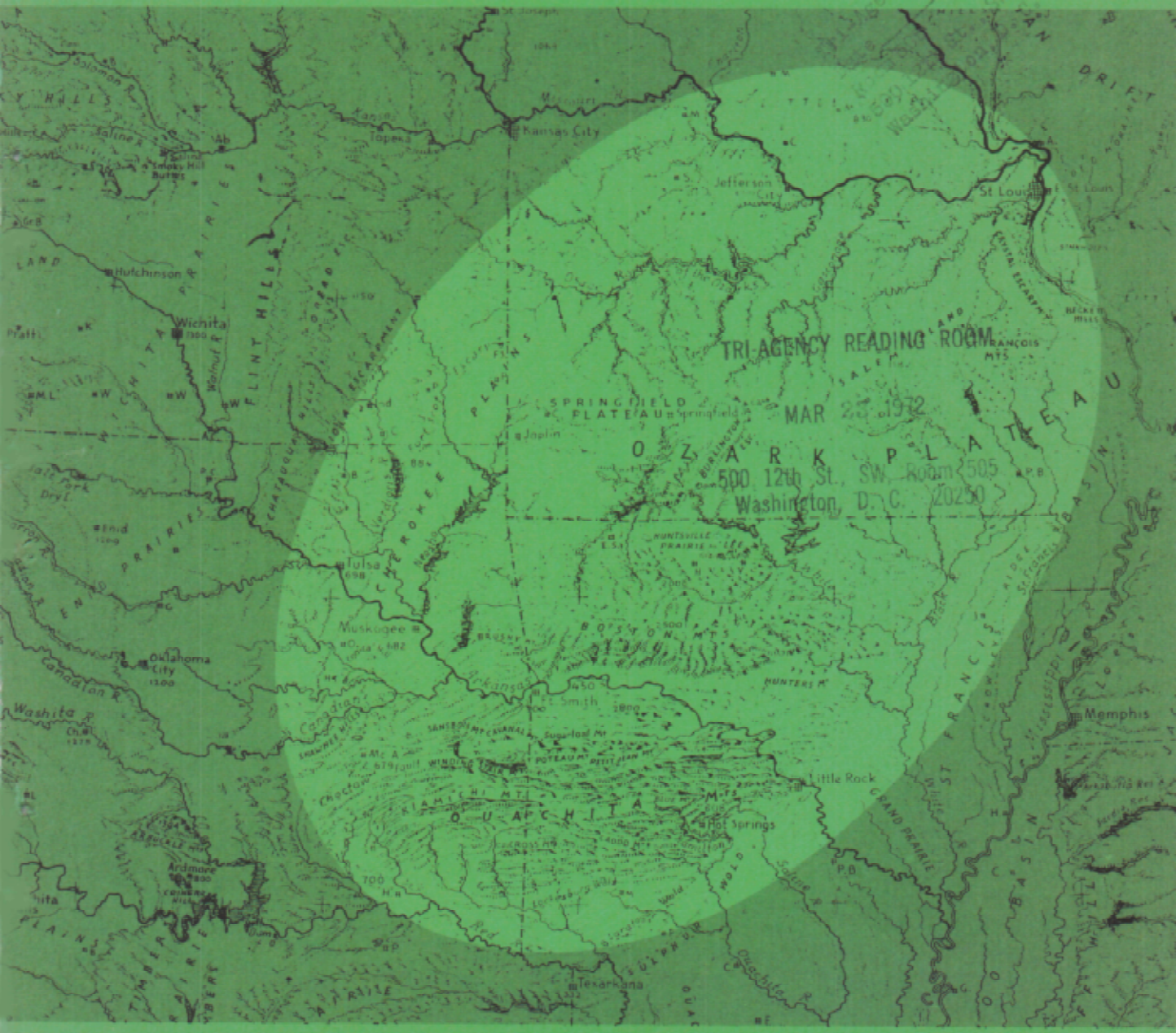
AGRICULTURAL ECONOMIC REPORT NO. 97

AN ECONOMIC SURVEY Of the OZARK REGION



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PREFACE

The delineation of the Ozark Region for purposes of this study was made July 1, 1965 and includes 115 counties. An official delineation of the region under the provisions of Title V of the Public Works and Economic Development Act of 1965 (P.L. 89-136) was made March 1, 1966 and included 125 counties. This official delineation added the following counties to those of the study delineation: in Oklahoma--Carter, Creek, Garvin, Lincoln, McClain, Murray, Pottawatomie, and Seminole; in Arkansas--Dallas, Grant, Lonoke, and Prairie. Study counties deleted from the official delineation were Hempstead and Little River Counties in Arkansas. Counties included in the study delineation and the official delineation were identical in Missouri.

This report identifies the major problems in the economy of the Ozark Region and indicates the potentials of the region and the need for additional study. Specific objectives are:

(1) To inventory the major resources of the region and the problems and potentials associated with resource development;
(2) To determine the direction and magnitude of changes in the region's resource use during the latest intercensal period;
(3) To isolate the important employment trends in the major economic activities;
(4) To evaluate the effects of the economic problems of the region on its demographic structure, employment, and incomes.

Census county data which could be aggregated for the region were used in the study. Other reports of studies within the region were consulted where appropriate. It was not the purpose of this study to generate primary data.

ACKNOWLEDGMENTS

Appreciation is extended to Melvin R. Janssen, Field Research Coordinator, Economic Development Division, ERS, for his constructive suggestions in the development of this report.

Cover map, courtesy of Erwin Raisz, Cambridge, Mass.

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HIGHLIGHTS

The Ozark Region as delineated for this study comprises 115 counties in, or bordering, the Ozark and Ouachita Mountain areas of Arkansas, Missouri, and Oklahoma. (The official delineation of the region was made by John T. Connor, Secretary of Commerce, March 2, 1966, and included 125 counties.)

Employment opportunities within the region have contracted, causing a continued outmigration of youth, absolute population losses, and low incomes. Incomes are too low to support adequate public services. Low-wage labor-intensive industry moving into the area has contributed to an adverse industry balance.

A large part of the land is unsuited to further agricultural development. Much of the land adaptable to agriculture is forested. Only isolated areas specializing in poultry, dairy, and intensive crops have an intensive commercial agriculture which could serve as a development point for agriculture and related industry.

Much of the region is covered with slow-growing hardwoods; however, most of the Coastal Plains of Arkansas, the Ouachita Mountains, and the Arkansas River Valley have sufficient pine to support an expanded forest products industry for further development.

Recreation offers a potential use for physical resources. Recreation centers have emerged and are developing rapidly.

Bauxite, iron, lead, zinc, barite, coal, and natural gas are being exploited in the region. Mining employment has not contributed substantially to the economy and is not likely to expand, but the location of complementary processing and manufacturing activities near the commercial mineral operations could increase their economic significance.

Manufacturing employment has expanded rapidly in the predominantly urban areas of the region, but not enough to employ the large number of workers being released from agriculture. The manufacturing of the region is concentrated in slowly growing sectors such as apparel. A continued shift of manufacturing into the region will be required if a high growth rate is to be maintained with slow-growth manufacturing.

Public and private services adequate to support economic activities are available only in the larger urban centers of the region. Revenues from local sources alone are not adequate to support public services needed for development. The need for additional education and training is especially acute.

The age composition, insufficient education, and lack of marketable skills of the population tend to retard development of economic activities, and also tend to keep workers from moving where jobs are available. The major economic problem within the region affecting every type of adjustment is the amount and quality of education.

AN ECONOMIC SURVEY OF THE OZARK REGION

by

Max F. Jordan and Lloyd D. Bender 1/

PROBLEMS AND POTENTIALS

The shortage of employment opportunities for the human resources of the 115 counties of the Ozark Region is a major problem. In the 1950-60 decade, the labor force declined, unemployment increased, and underemployment remained high by national standards. The results were migration rates of about 40 percent in the most productive age groups, a median education level of 8.9 years for those in the region, and family incomes only 60 percent of the national median.

The magnitude of the deficiency in education is indicated by the differences between Ozark levels and those of the United States. The region would have 132,000 more high school graduates if education levels were equivalent to those of the Nation. Per pupil expenditures equivalent to the United States level of $375 per student in average daily attendance in 1959-60 would have required an additional expenditure that year of $55 million. A capital outlay for schools equivalent to the U. S. average would have required about $20 million more in the region in 1962. Retraining an estimated 40,000 underemployed persons at $1,700 a trainee for a 52-week training period would reach $68 million.

The seriousness of the problem is also indicated by the fact that 24 counties within the region had an average daily attendance less than 1,650 in 1959-60--the minimum size district necessary to support an adequate high school. The small school districts (whether incapable of consolidation because of isolation or not) need much larger expenditures per student to support even a minimum program. The local economies of the region cannot support the expenditures necessary to provide superior educational services.

Improving the quality of the human resources offers the greatest single potential for more complete utilization of those resources. A better trained labor force will contribute to more rapid economic development within the region. A good educational program for the youth will permit them to take

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1/ Mr. Jordan is Agricultural Economist, Economic Development Division, Economic Research Service, U. S. Department of Agriculture; Mr. Bender was formerly Associate Professor of Agricultural Economics, University of Arkansas. Adlai F. Arnold, formerly Associate Professor of Agricultural Economics, University of Arkansas, assisted with the early drafts of the timber and minerals sections.

advantage of a broader range of opportunities within or outside the region. Adult education programs tailored to the needs of the underemployed and unemployed of the region will allow adults to make needed adjustments.

The potential of individuals can be greatly enhanced by an accelerated program of basic education to qualify them for labor force participation. Since labor force requirements are changing so rapidly, existing rates of improvement in education are narrowing the gap between education levels and labor force requirements only slightly. Programs superior to those of most other regions are needed if the gap is to be closed.

The recreation industry offers the best single opportunity for providing additional employment by developing the physical resources of the region. Recreation in the region is already a basic industry, and recreation demand is increasing.

Recreation centers are emerging around the major reservoirs, especially those with access to the main concentrations of population, and around other attractions of the region. On the basis of past recreation-related trade and service employment, six recreation centers can be identified. The first is Garland County, Ark., with 38 percent of the county labor force in recreation-related employment. Hot Springs, the center of the development, has ready highway and air access, and diversified recreation. The second center surrounds the Lake of the Ozarks in Missouri, near Kansas City and St. Louis, and specializes in water-based sports, sightseeing, entertainment, and related activities. The third center is the Lake Texoma area in Oklahoma north of Dallas and Fort Worth. The White River center includes Lakes Norfork, Bull Shoals, Taneycomo, Table Rock, and Beaver; the Blanchard Springs Cavern; and the Ozark Cultural Center. The reservoirs in east central and northeast Oklahoma near Tulsa comprise the two other centers.

The principal needs for further recreation development in the region include:

(1) Highway and air access to recreation centers.

(2) Concentrations of diversified facilities.

(3) Coordination of development through planning and zoning.

(4) Development of complementary public services such as health facilities and regulations, sanitary facilities, communications, and public protection.

(5) Credit systems for predominantly rural areas.

(6) Insurance programs for recreation-related developments.

The growth of population in nearby metropolitan centers and the continued growth of demand for family vacation services favor increased employment in recreation. Family recreation is the most important source of recreation employment in the region, and has a greater employment multiplier than other types of recreation that require less complex facilities.

An expanded recreation industry will contribute to additional employment of local residents. As a basic industry, recreation contributes to local demand for other services. In addition, there are other industries closely linked to recreation which have a potential in the region. Retirement communities and part-time homes, for instance, should contribute to the local economies of the recreation centers.

The problems of the recreation industry relate primarily to development of the full potential of the region. A number of additional measures can be taken to stimulate further development. Concentration of diversified facilities requires local private cooperation and initiative. Many measures, such as planning and zoning, require local private and public initiative. However, provision of highways and air access, public health facilities, and home financing may require cooperation of Federal, State, and local governmental units.

A major problem associated with the lack of employment opportunities in manufacturing is the lack of centers with adequate public and private services. In 1960, only 14 towns and cities within the region had populations over 10,000. Forty percent of the manufacturing employment was located within the 11 predominantly urban counties. 2/ Only eight counties had over 30 percent of the labor force employed in the trades and services most closely related to manufacturing.

A relatively small but increasing proportion of the Ozark labor force is employed in manufacturing. In the 1950-60 decade, however, manufacturing employment increased 39,945 while agricultural employment decreased 142,110. A high proportion of the new manufacturing employment was composed of women, indicating that those released from agriculture were not those employed in manufacturing. The industries moving into the region are primarily labor-intensive and slow-growth types utilizing female labor. Continued increases in female employment will mask, and maintain, male underemployment. Since the manufacturing growth is of the slowly growing type, an adverse industry balance is also maintained and growth of existing industries will not likely absorb large numbers from agriculture and forestry.

Policies and programs designed to increase the public services in and around potential centers of manufacturing are necessary for development of new industry. These include development of public services and facilities needed by industry. Education to improve labor force capabilities and the community as a place to live must be furnished. Complementary relationships among industries can encourage further industrial development. Measures to expand employment in existing firms are especially appropriate.

A large part of the land in the Ozark Region is unsuited to agriculture for crop and forage production. Incomes on the many small farms have been low, resulting in movement of a large number of people from agricultural employment in recent years. The age of the farm operators, the nature of the land resources, and the levels of income make it virtually impossible to develop a highly commercial agriculture for the area with farms of sufficient size to provide an adequate income for the farm family.

2/ See Appendix B for list of urban and rural counties in region.

A few younger farmers with considerable resources and managerial ability should be aided to develop adequate commercial farm units. Those young farmers without resources and managerial ability should be aided to develop opportunities outside of agriculture. Older farmers, too young to retire and without other opportunities, should be assisted to use their existing resources to improve incomes as much as possible, but it is unlikely that many will have the managerial capacity to utilize enough resources for adequate levels of income. They can be assisted in getting local part-time employment to the extent this employment is available. Older farmers of retirement age can be helped to retire to release resources for incorporation in farms of younger operators. "Boxed-in" farmers and those of retirement age may need welfare supplements to relieve undue privation.

The Ozark Region has a high proportion of its land in timber. The Coastal Plains of Arkansas, the Ouachita Mountains, and the Arkansas River Valley have highly productive well-stocked stands of pine forests. However, over half of the timber in the Ozark Uplands is on poor sites with poor quality of timber, and much of the timber throughout the region is in small tracts with poor management.

One step to improve the potential of timber production of the region is to consolidate the small tracts into larger holdings that justify better management. The best use of the poor sites is for flood protection, recreation, and site protection. In some parts of the region with good supplies of timber and growth capabilities there is considerable potential for expansion of forest-products industries. Additional utilization of forest products will provide incentives to consolidate holdings and improve management.

The varied mineral resources located within the region have had limited exploitation and have not contributed significantly to employment. Mining employment in the region is not likely to expand due to the modest size of the higher grade deposits, the low quality of the larger mineral deposits, and depressed market prices. But with complementary processing and manufacturing activities near the commercially feasible mining operations, their economic significance can increase.

Public services of the developing centers within the region are inadequate for the full development potential to be realized. Manufacturing, recreational, agricultural, and forestry centers each require a unique set of public services, although in most cases there will be combinations of these sets required.

Local and State Governments will be unable to supply all the programs necessary for full development of the region. Maintenance and operation of adequate programs cannot now be provided, especially education and training. Only with the full cooperation of all governmental agencies and private groups can an appropriate combination of public and private services be developed and maintained.

Government employment is about 10 percent of total employment of the region. Local governmental employees are the largest single group. There are many Federal and State services now located in congested urban areas that can be decentralized and located in areas such as the Ozark Region. While these

services must be located near population centers for needed transportation, communication, and other services, these may be smaller centers than they currently occupy. Costs of governmental services and economic development should be considered as a part of overall economic development policy.

The problems of the Ozark Region vary among areas. Each area with differing resources and potentials must be treated separately, but as a part of the region and the U. S. economy as a whole. Since there are many problems, each with many facets, a single program will not solve them. It will take coordinated efforts among all levels of government and private groups to develop the economy of the region.

THE REGION

Delineation of the Region

The Ozark Region includes 42 counties in Arkansas, 44 in Missouri, and 29 in Oklahoma (fig. 1).

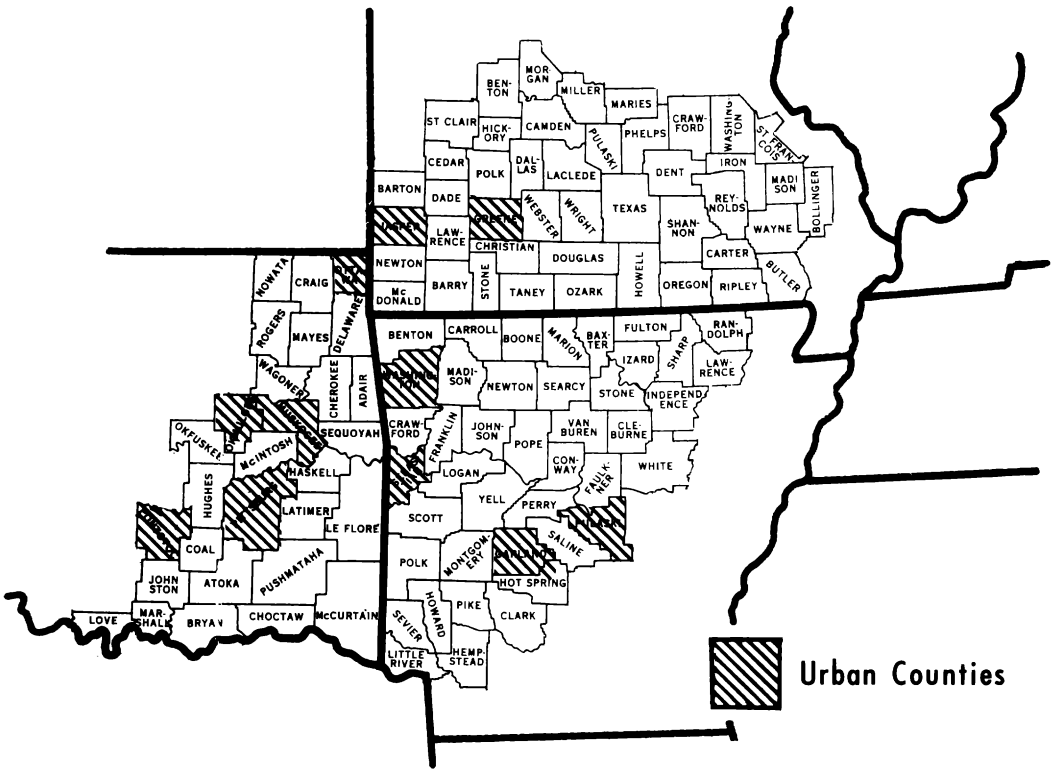

FIGURE 1. URBAN AND RURAL COUNTIES, OZARK REGION

The region was delineated by the following sequential procedure: 3/

(1) Initially included were all counties one-half or more within well-defined Ozark or Ouachita soil associations.

(2) Border counties adjacent to the area above were included if (a) the 1960 median family income in the county was $3,000 or less, (b) the soil productivity was low, or (c) the county had been designated 5a or 5b by the Department of Commerce. 4/

(3) Additional counties or groups of counties adjacent to the basic region were included if they had abundant mineral or recreational resources with undeveloped income potentials.

(4) Counties bounded on three or four sides by the above area were included.

Urban and nonurban counties within the region were defined for further analysis as follows: Counties were classified as predominantly urban if one-half or more of the 1950 county population was urban, regardless of the size of the major population centers. Counties with 1960 population less than one-half urban were classed as predominantly rural. Five counties in Oklahoma, four in Arkansas, and two in Missouri are predominantly urban according to these criteria.

Physiographic Features of the Ozark Region

The Ozark Region may be divided into four broad physiographic areas (fig. 2): (a) the Ozark Uplands of about 40,000 square miles, almost half the region, including the Salem and Springfield Plateaus and the Boston Mountains; (b) the Arkansas River Valley; (c) the Ouachita Mountains; and (d) border counties consisting partly of coastal plain, prairie, bottomland, or bottomland terrace.

Ozark Uplands

The Salem Plateau occupies about two-thirds of the Ozark Uplands. Rising from the plateau in Southeast Missouri are the St. Francois Mountains, of igneous rocks, covering an area of about 70 square miles. Their peaks rise to about 1,800 feet above sea level.

The Springfield Plateau lies generally west of the Salem Plateau, but a narrow strip circles to the south and lies between the Salem Plateau and the Boston Mountains.

3/ The counties delineated for purposes of this study do not constitute an official delineation of the Ozark Region under the provisions of Title V of the Public Works and Economic Development Act of 1965. See Preface.

4/ Areas eligible for the development assistance provided in the Area Redevelopment Act of 1961 were specified in Sections 5(a) and 5(b) of the Act. Criteria for designation included high unemployment rates and low income.

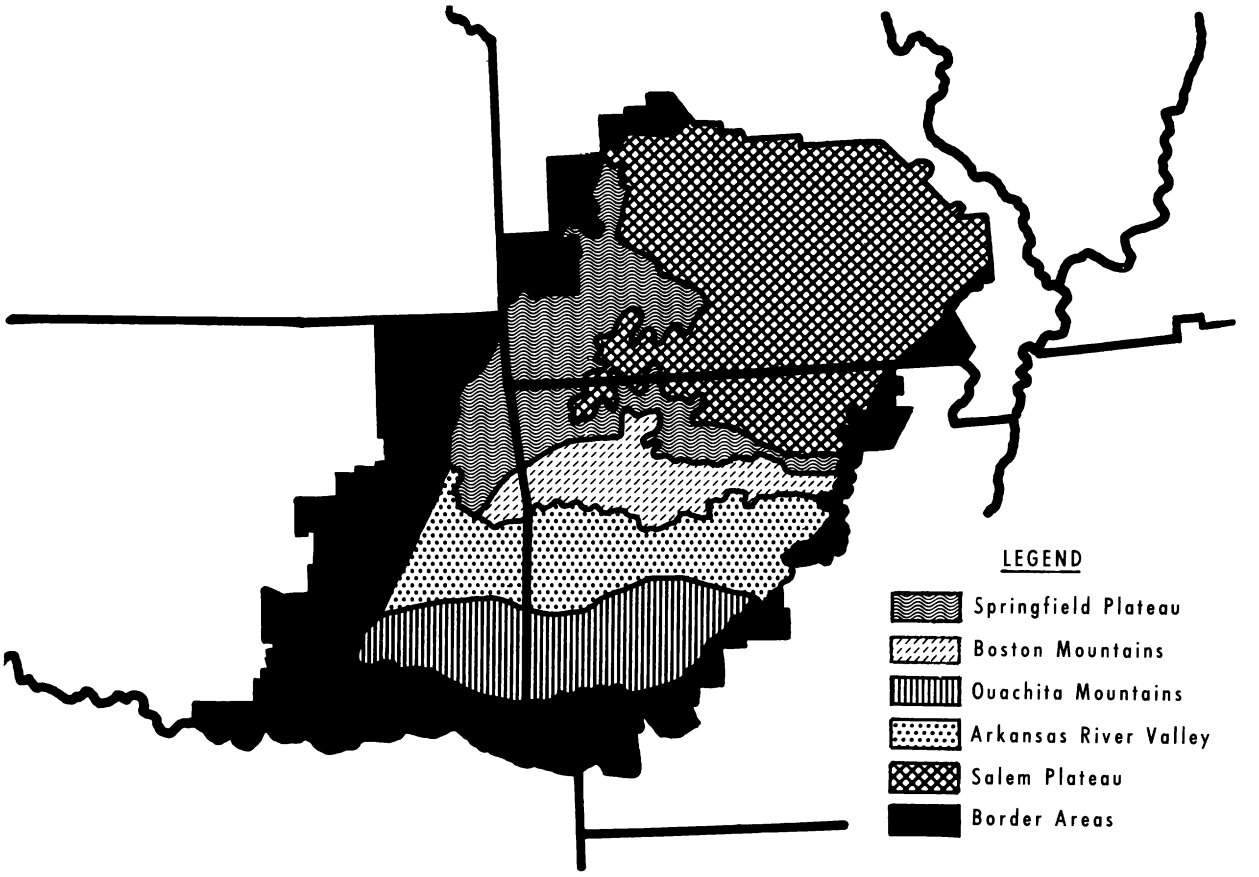

Figure 2. Physiographic Areas of the Ozark Region

The Boston Mountains comprise some of the most rugged lands of the Ozark uplift. They are about 200 miles long east and west and average about 35 miles wide. They rise several hundred feet above the Springfield and Salem Plateaus to the north and drop off steeply to the Arkansas River Valley to the south. They form the southern boundary of the Ozark Uplands north of the Arkansas River.

The Arkansas River Valley

The Arkansas River Valley is a deep depression lying principally between the Boston Mountains to the north and the Ouachita Mountains to the south. The bottomlands along the river are 2 to 6 miles wide. Much of the land in the valley away from the bottoms is rolling to hilly, with isolated mountains 500 to 600 feet high, chiefly south of the Arkansas River. Magazine Mountain, 2,823 feet, is one of the highest elevations in Arkansas, and one of the highest points between the Alleghenies and the Rockies.

The Ouachita Mountains

Averaging 60 miles wide, the Ouachita Mountains extend from Little Rock, Ark., to Atoka, Okla. They are roughly delimited on the north and northwest from Little Rock to Danville by the Rock Island Railroad. In the valley of the Poteau River, which flows westward into Oklahoma, the Choctaw Fault serves

as the northwest limit. The boundary follows this fault westward and southwestward to the coastal plain. The southern boundary of the Ouachita Mountains terminates at the coastal plain in Oklahoma and Arkansas.

At the eastern end of the Ouachita Mountains the elevation is about 500 feet, rising to a maximum height of more than 2,600 feet near the Oklahoma-Arkansas border. From there the elevations diminish to about 750 feet at the west end. At each end of the Ouachita uplift the elevations are about 250 feet above the coastal plain.

The Border Areas

The border areas of the Ozark Region are comprised of prairies and coastal plains almost entirely surrounding the Ozark-Ouachita uplift areas. The prairies are on the western boundary from Missouri south across Oklahoma where they merge with the coastal plain and extend around to the south into Arkansas. Broadly speaking, the eastern boundary of the study area can be called coastal plain, even though it merges into the Mississippi and Missouri bottomlands on the northeast and north.

THE HUMAN RESOURCES OF THE REGION

People who originally settled in the Ozark mountains were descendants of the early English colonists from the mountain regions of Kentucky, Tennessee, Virginia, North Carolina, and other eastern States. 5/ The settlers engaged in trapping, fishing, and subsistence farming for a livelihood. Exploitation of the timber resources of the region eventually became the major economic activity.

Because of the isolated nature of the early settlements, the people in the heart of the Ozark Region have retained much of their folk culture. Value systems tend to be particularistic, and self-sufficiency of the local community has bred a distrust for values from outside the community. Personal ingenuity in meeting social, economic, and family problems is a cultural trait derived from this orientation. With this social background, people of the region have been slow to assimilate urban values and ways of living, and economic changes have lagged behind those in most of the Nation.

Population Trends

The population of the Ozark Region reached a maximum about 1910 when the logging and lumbering industry was important (14, 27). During the 1950's the region's population declined 4.4 percent (table 1). U. S. population increased 18.5 percent and Appalachian population increased 1.5 percent during the same period. Migration from the Ozark Region has long been large due to the excess of births over deaths and the paucity of economic opportunity.

The Ozark Region is still predominantly rural despite the growth of urban population centers within the region. However, between 1950 and 1960 the urban

5/ This section draws upon Gregory (27). Underscored numbers in parentheses refer to Selected References, p. 71.

Table 1.--Population change, Ozark Region, Appalachia, and United States, 1950 to 1960 1/

Item	Population 1960	Population change 1950-60	
	Number	Number	Percent
United States	179,323,175	27,997,377	18.5
Appalachia	15,033,000	223,800	1.5
Ozark Region	2,250,805	-104,489	-4.4
Rural counties	1,443,946	-155,193	-9.7
Urban counties	806,859	50,704	6.7
Arkansas	931,776	-31,404	-3.3
Rural counties	519,617	-85,595	-14.1
Urban counties	412,159	54,191	15.1
Missouri	786,330	19,445	2.5
Rural counties	581,191	-1,765	-0.3
Urban counties	205,139	21,210	11.5
Oklahoma	532,699	-92,530	-14.8
Rural counties	343,138	-67,833	-16.5
Urban counties	189,561	-24,697	-11.5

1/ See Appendix B for urban and rural counties in region.

Source: (69).

population increased in the Missouri and Arkansas portions of the region. Rural population (rural nonfarm and rural farm) declined in all three State portions and the region had a net population loss (15, 55, 68). In 1960, only 39 percent of the population in the region was in urban areas as defined by the Census of Population.

Until recently, the population of the Ozark Region was weighted heavily with those of dependent ages--under 18 or over 64. But in 1960, the proportion in these age groups was about the same as in the rest of the country--34 percent compared with 36 percent (15, 68). The proportion of the population in these dependent age groups was higher in the rural counties of the region than in the urban counties.

Migration from the region has been mainly of two types. A study of Arkansas migration indicated the movement of individuals separated from the parental family before becoming established independently constituted the principal stream of outmigration from farms in the State before 1950 (14). The rate of this type of migration was highest in the groups completing high school and in the 18 to 35 age range. Family migration, especially migration of families with lower skills and little training for nonfarm employment, became more

prevalent in the State during the 1950's, although migration of individuals continued. It is presumed these patterns held true for the Ozark Region as well as for Arkansas.

Every county in the region except the two urban counties in Missouri had net outmigration between 1950 and 1960 (table 2). The migration rate was greatest in the 20-29 age group--around 40 percent. The net migration rate among young people of every age group was much higher in the rural than in the urban counties. The continued movement of the younger members of the labor force from the region in the 1950's is directly reflected in the skill composition of the labor force remaining in the region, as well as in the absolute size of the labor force. Both these factors affect the ability of the region to maintain and build a viable industry base.

Several additional implications of these population changes are noted by Charlton (14). Reduction in the number of people in rural areas hampers diffusion of knowledge and values, and makes social interaction more difficult. The tax base declines, yet services become more expensive on a per capita basis, and the need for special services, such as those for the aged, increases.

Educational Levels

The low level of educational attainment holds back development of the region and also hinders individuals from obtaining employment outside the region. In 1960, more than one-tenth of the Ozark population 25 years old or over were functional illiterates with less than 5 years of formal education (68). The average was 13 percent in the rural counties and 8 percent--close to the U. S. average--in the urban counties.

Although a high school education is considered a minimum qualification for most skilled jobs in the United States, only 31 percent of Ozark Region residents 25 years of age or over had completed high school in 1960. The median number of school years completed by this group was 8.9, compared with the U. S. median of 10.6 (table 3). School enrollment in the region in 1960 was 86.5 percent of the population aged 5 to 17 years, not far below the 89 percent enrollment in the United States (68); however, the median educational level of the region's population will remain low if the high outmigration of young people continues.

Levels of Living

Regions with a surplus of unskilled labor usually have low incomes and may even be victims of a circular effect in which the income gap is widened (30). In 1959, both median family income and income per capita in the Ozark Region were far below those in the United States (table 4). The U. S. median family income was $5,660. The Ozark median was $3,373. The median was much lower for rural counties than for urban counties.

One indication of the level of living in an area is the proportion of its families having certain housing facilities. The rural counties are much below

Table 2.--Migration rate 1/ by age group, Ozark Region, 1950 to 1960

Age in 1960	Ozarks			Arkansas			Missouri			Oklahoma		
	Total	Rural	Urban 2/	Total	Rural	Urban 2/	Total	Rural	Urban 2/	Total	Rural	Urban 2/
All ages	-15.3	-19.1	- 7.1	-16.4	-24.5	- 2.8	- 6.4	- 8.8	1.2	-24.3	-25.7	-21.6
10-14	-15.2	-18.3	- 8.6	-17.2	-24.1	- 5.5	- 7.0	- 8.9	- 0.7	-21.3	-21.9	-20.2
15-19	-17.7	-22.1	- 7.0	-19.5	-28.6	- 1.5	- 5.6	- 8.5	5.6	-28.7	-30.7	-24.4
20-24	-36.2	-46.2	- 9.1	-33.2	-52.7	10.3	-22.0	-28.1	4.6	-55.9	-60.6	-45.3
25-29	-41.4	-52.0	-15.2	-37.3	-55.4	1.0	-34.0	-41.6	- 5.8	-55.5	-60.5	-44.9
30-34	-23.1	-28.4	-13.8	-25.2	-36.5	- 9.4	-12.1	-14.5	- 5.9	-32.8	-34.6	-29.8
35-39	-15.3	-18.3	-10.3	-17.1	-25.1	- 6.5	- 6.5	- 7.4	- 4.5	-23.1	-23.2	-22.9
40-44	-11.3	-13.2	- 7.9	-12.8	-18.6	- 4.8	- 3.4	- 3.8	- 2.4	-18.5	-18.2	-19.2
45-49	- 8.2	- 9.8	- 5.0	- 9.5	-14.2	- 2.3	- 2.0	- 2.2	- 1.2	-13.8	-14.0	-13.4
50-54	- 5.6	- 6.9	- 3.0	- 6.3	-10.0	- 0.4	- 0.9	- 1.0	- 0.5	-10.5	-10.8	- 9.9
55-59	- 2.6	- 3.1	- 1.7	- 3.4	- 5.9	0.4	1.9	1.9	1.8	- 7.1	- 6.3	- 8.6
60-64	1.0	1.0	1.1	- 0.2	- 2.0	2.0	2.5	4.2	4.5	- 1.3	0	- 3.6
65-69	3.9	3.4	4.8	3.3	1.6	6.2	6.2	6.2	6.3	1.6	1.9	1.2
70-74	4.6	- 3.5	6.9	4.9	2.6	9.1	6.7	6.0	8.8	1.3	1.0	1.8

1/ Net migration estimates expressed as a percentage of the 1950 population that survived to 1960. Minus sign denotes net outmigration.

2/ See Appendix B for urban and rural counties in region.

Source: Compiled from data in (10).

Table 3.--Median school years completed by persons 25 years of age and over, Ozark Region and United States, 1960 1/

Item	Median school years completed
United States	10.6
Ozark Region	8.9
Rural counties	8.7
Urban counties	10.4
Arkansas	9.3
Rural counties	8.7
Urban counties	10.9
Missouri	8.9
Rural counties	8.7
Urban counties	10.5
Oklahoma	8.7
Rural counties	8.5
Urban counties	9.2

1/ See Appendix B for urban and rural counties in region.

Source: Calculated from data in (68).

Table 4.--Median family income and per capita income, Ozark Region, Appalachia, and United States, 1959 1/

Item	Median family income 1959	Per capita income
	Dollars	Dollars
United States	5,660	1,850
Appalachia	5,287	1,451
Ozark Region	3,373	1,233
Rural counties	2,867	1,070
Urban counties	4,384	1,524
Arkansas	3,423	1,238
Rural counties	2,740	986
Urban counties	4,459	1,554
Missouri	3,516	1,290
Rural counties	3,107	1,175
Urban counties	4,664	1,617
Oklahoma	3,046	1,138
Rural counties	2,707	1,018
Urban counties	3,843	1,356

1/ See Appendix B for urban and rural counties in region.

Source: (15, 68).

the urban counties of the region in this respect. In the rural counties of the region, 56 percent of the housing units had hot and cold running water in 1960 (table 5). About the same proportion had a flush toilet and a tub or

Table 5.--Percentage of housing units without specified facilities, Ozark Region, 1960 1/

Item	Housing units without--				
	Hot & cold water 2/	Flush toilet	Tub or shower	Water system 3/	Sewage system 4/
	Percent				
Ozark Region	34.1	32.1	33.4	7.8	32.0
Rural counties	43.5	42.2	43.3	10.5	43.0
Urban counties	16.3	13.6	15.2	2.7	12.0
Arkansas	31.7	29.6	31.0	7.7	28.8
Rural counties	44.7	43.3	44.5	11.5	43.3
Urban counties	15.0	11.9	13.7	2.8	10.0
Missouri	36.4	34.0	35.2	9.1	34.7
Rural counties	44.9	42.5	43.6	11.8	44.0
Urban counties	12.1	9.6	11.0	1.4	7.7
Oklahoma	34.7	33.5	34.6	6.0	33.6
Rural counties	39.3	40.1	41.0	7.0	40.8
Urban counties	23.6	21.6	23.1	4.1	20.6

1/ See Appendix B for urban and rural counties in region.
2/ Piped inside the structure.
3/ Includes water coming directly from springs, creeks, ponds, rivers, lakes and other sources besides public and private systems and individual wells.
4/ Units not having access to public sewers, and lacking septic tanks or cess pools.

Source: (70).

shower. About 8 percent of all housing units in the region obtained water from springs, creeks, ponds, rivers, lakes, and other sources besides public and private water systems and individual wells.

The Changing Labor Force

The civilian labor force of the Ozark Region 6/, paralleling the population changes, declined 5.4 percent between 1950 and 1960 (table 6). The

Table 6.--Civilian labor force: Participation of population 14 years of age and over, Ozark Region and United States, 1950 and 1960 1/

Item	Participation in civilian labor force						Change in civilian labor force, 1950-60		
	1950			1960					
	Male	Female	Total	Male	Female	Total	Male	Female	Total
	Percent								
United States	78.0	28.9	52.9	74.6	34.5	54.0	7.0	35.4	14.9
Ozark Region	72.9	21.1	46.8	64.4	27.8	45.8	-15.2	27.8	-5.4
Rural counties	73.0	17.5	45.4	61.9	24.5	43.3	-21.3	30.7	-11.3
Urban counties	72.8	28.1	49.6	69.2	33.4	50.5	-2.2	24.3	5.6
Arkansas	74.4	22.6	48.0	67.7	30.0	48.3	-12.8	30.9	-2.3
Rural counties	74.7	16.8	45.8	66.5	24.8	45.2	-22.5	33.8	-12.2
Urban counties	73.9	31.4	51.7	69.3	36.5	52.2	3.9	28.5	11.7
Missouri	74.9	21.7	48.2	62.8	28.0	45.6	-12.3	31.3	-2.4
Rural counties	74.9	19.6	47.5	59.4	26.1	43.4	-17.2	31.9	-7.2
Urban counties	75.1	27.4	50.0	73.6	32.9	51.9	3.3	30.1	11.1
Oklahoma	68.1	18.1	43.1	61.2	23.6	42.0	-23.2	16.2	-14.9
Rural counties	67.6	15.4	41.7	59.4	21.5	40.1	-25.9	23.4	-16.8
Urban counties	69.0	23.0	45.7	64.5	27.2	45.2	-18.2	7.5	-11.7

1/ See Appendix B for urban and rural counties in region.

Source: (55, 68).

decline occurred despite a large movement of women into the labor force. The female labor force increased in each State portion of the region, totaling 28 percent for the region. The United States increase was 35 percent. The male labor force declined in all except the urban Arkansas and Missouri counties. These were the only counties that did not show an overall decrease in labor force.

6/ The civilian labor force is defined as all civilians 14 years old and over who were employed (at work, or with a job but not at work) or unemployed (looking for work). Hereafter, the term labor force will refer to the civilian labor force.

Participation in the labor force is lower in the Ozarks than in the United States as a whole owing to the lack of employment opportunities. The U. S. participation rate was 54.0 percent in 1960. Participation in the region was below that figure in all three States, averaging 45.8 percent. However, the urban counties approached the U. S. average.

The unemployment figures of the census do not take into account "hidden unemployment" and "underemployment" (table 7). The low participation in the

Table 7.--Unemployment in the Ozark Region, Appalachia, and United States, 1950 and 1960

Item	Unemployment		Share of civilian labor force	
	1950	1960	1950	1960
	Number	Number	Percent	Percent
United States	2,832,200	3,504,800	4.8	5.1
Appalachia	263,900	368,000	5.1	7.0
Ozark Region	30,227	40,803	3.8	5.4
Rural counties	17,471	26,332	3.4	5.7
Urban counties	12,756	14,471	4.6	4.9
Arkansas	12,882	18,301	3.9	5.6
Rural counties	6,843	11,047	3.5	6.4
Urban counties	6,039	7,254	4.4	4.7
Missouri	8,265	12,045	3.1	4.6
Rural counties	5,476	8,741	2.7	4.7
Urban counties	2,789	3,304	4.0	4.2
Oklahoma	9,080	10,457	4.8	6.4
Rural counties	5,152	6,544	4.3	6.6
Urban counties	3,928	3,913	5.5	6.2

1/ See Appendix B for urban and rural counties in region.

Source: (15, 55, 68).

labor force may be a result of unemployment forced upon the individual because of lack of opportunity rather than lack of initiative or drive. Peterson stated that "fewer rural workers appear to be actively seeking work when they know that job opportunities are limited locally". 7/

7/ John M. Peterson. Economic Development Planning Needs of the Ozarks. Testimony before the Senate Committee on Public Works concerning the Public Works and Economic Development Act of 1965.

Underemployment is difficult to define and measure. In a 1956 survey of 12 counties in the Arkansas Ozarks, Metzler and Charlton determined that a large proportion of the farmers were underemployed in terms of days worked in comparison with days worked by persons in other occupations (38, pp. 29, 57). Farm operators averaged an equivalent of 166 days of work on and off the farm, while the average for persons engaged in nonfarm pursuits was 231 days. The average for farm operators 24 to 64 years of age averaged only slightly above that for all farmers.

Census data on weeks worked in 1959 provide some indication of underemployment (table 8). Fifty-seven percent of the persons working in the United

Table 8.--Proportion of workers who worked specified numbers of weeks, Ozark Region and United States, 1959 1/

Item	50 to 52 weeks	48 to 49 weeks	40 to 47 weeks	27 to 39 weeks	14 to 26 weeks	13 weeks or less
	Percent					
United States	56.8	5.6	8.9	9.3	8.4	11.0
Ozark Region	51.2	5.5	9.0	11.1	10.0	13.2
Rural counties	48.9	5.8	9.4	11.6	10.5	13.8
Urban counties	55.7	4.9	8.1	10.2	9.0	12.0
Arkansas	51.8	5.3	8.7	11.2	9.9	13.2
Rural counties	45.9	5.6	9.6	12.4	11.1	15.5
Urban counties	58.7	5.0	7.6	9.8	8.5	10.6
Missouri	52.4	5.7	9.1	10.9	9.8	12.8
Rural counties	52.4	5.9	9.3	10.8	9.7	11.8
Urban counties	52.7	4.7	8.0	11.4	10.0	13.4
Oklahoma	47.8	5.6	9.4	11.5	10.5	15.2
Rural counties	46.1	5.9	9.3	12.1	11.0	15.6
Urban counties	50.6	5.0	9.6	10.6	9.8	14.4

1/ See Appendix B for urban and rural counties in region.

Source: (68).

States in 1959 worked 50 or more weeks, compared with 51 percent in the Ozark Region as a whole and 49 percent in the rural Ozark counties. If the data accurately reflect weeks worked by those in the labor force, considerable underemployment exists in the Ozarks.

Agriculture, including forestry and fisheries, continues to dominate the economy of the Ozarks, despite major readjustments in the past quarter century. In contrast to the Appalachian Region and the United States as a whole where

the labor force employed in agriculture was about 6 percent in 1960, 13.5 percent of the Ozark Region's labor force was in agriculture in 1960 (table 9). However, the 58-percent decline in agricultural employment in the Ozark Region between 1950 and 1960 was much greater than the decreases in the United States and Appalachia.

Table 9.--Share of the civilian labor force employed in major industries, Ozark Region, Appalachia, and United States, 1950 and 1960

Major industry and area	Share of civilian labor force		Change in employment 1950 to 1960	
	1950	1960		
	Percent	Percent	Number	Percent
Agriculture, forestry, and fisheries:				
United States	11.9	6.4	-2,683,707	-38.2
Appalachia	12.3	5.8	-334,900	-52.0
Ozarks	30.6	13.5	-142,110	-58.3
Mining:				
United States	1.6	1.0	-276,962	-29.8
Appalachia	8.6	3.5	-265,400	-58.8
Ozarks	2.0	1.4	-5,108	-32.0
Manufacturing:				
United States	24.8	25.7	2,827,604	19.3
Appalachia	26.4	30.1	212,700	15.4
Ozarks	12.1	18.1	39,945	41.5
Construction:				
United States	5.8	5.6	357,957	10.4
Appalachia	5.2	5.3	14,000	5.2
Ozarks	6.1	7.0	4,088	8.4
Trades and services:				
United States	51.1	56.2	7,979,082	26.3
Appalachia	42.4	48.2	341,400	15.4
Ozarks	45.4	54.6	49,745	13.8

Source: (15, 55, 68).

Increases between 1950 and 1960 in employment in manufacturing and trades and services in the Ozark Region were not enough to offset the losses in agriculture and mining. Number of persons employed in agriculture and mining decreased 147,218, compared with a gain in other sectors of only 93,778. However, losses in agricultural employment in the 1960's could be offset by gains in other sectors if these continue to expand at present or accelerated rates.

Human Resource Problems and Potentials

Underemployed and unemployed human resources represent a waste to the Nation and the area in which they are found. The loss of aggregate demand, skilled labor, capital, and other factors associated with selective migration are problems which set up a self-perpetuating income gap between the area and the rest of the country (30). Until this downward spiral in the economic activity is broken, outmigration will continue. Outmigration and its effects are simply the symptoms of deep-seated problems within an area.

Development of programs to upgrade education to qualify the population for labor force participation regardless of place of residence will affect the economy of the Ozark Region and the welfare of individuals in the region. Investment in human resources is a mechanism for development. Experience has shown that aspirations change as the unskilled are trained. High-quality education is one important means of enabling individuals to become involved in the development process and to make significant contributions to society.

AGRICULTURAL RESOURCES

The shortage of suitable resources has been a major obstacle in the development of agriculture in the Ozarks. The land, capital, and human resources are the limiting factors in the growth of the agricultural economy of an area.

Land Utilization

The suitability of the region's soils (productivity and adaptability) to agriculture, and the feasibility of shifting the region's farm units into economic-size operations are important to its agricultural potential.

The soils of the region are generally characterized by low fertility, rough topography, stoniness, and poor moisture-holding capacity. There are areas of fine agricultural production in the fertile river valleys and on some of the plateaus and prairies, but the total acreage is small.

The Ozark Uplands, with nearly 6.8 million acres in the Springfield Plateau, 14.2 million acres in the Salem Plateau, and nearly 3.7 million acres in the Boston Mountains, make up 47 percent of the land area in the 115-county region. The predominant soils in the Springfield Plateau are cherty brown limestone soils, originally forested but now in a variety of uses from forest and pasture to fruit, truck, and field crops.

The most abundant soils in the Salem Plateau are generally rough, stony, and of low fertility. Most of these soils have little agricultural value and are in pasture and slow-growing hardwoods.

The major soils in the Boston Mountains are generally shallow sandy loams, often stony, over sandstone. The area is largely in woodland.

In the Arkansas River Valley, which comprises about 6.1 million acres, the principal soils are deep sandy loams. Land use in the valley is about equally divided between cropland and pasture at one intensity extreme, and forest and rangeland at the other. The largest single soil association, covering 2 million acres, is in forest and rangeland.

The Ouachita Mountain area covers about 6.8 million acres. Predominant soils are silt to sandy loams that are chiefly in woodland of shortleaf pine and mixed upland hardwoods. There are some scattered general farms.

Around the periphery of the Ozark Region are various types of soil associations differing significantly from those in the Ozark and Ouachita uplifts and the Arkansas River Valley. The approximately 14.7 million acres included in these border areas comprise prairies, coastal plains, bottomlands, and terraces. In the border areas of Arkansas, the forested coastal plain soils predominate, covering about 1.5 million acres. These soils are largely in pine timber and general farming units. The eastern (Cherokee) prairie soils predominate in the Oklahoma border areas, covering about 3.7 million acres--one-fourth of the total land area in the 29 Oklahoma counties. These prairie soils are largely in pasture and rangeland. The majority of the border soils in Missouri are prairie soils. These soils of low to medium fertility cover about 1.9 million acres in cropland and pasture.

The Soil Conservation Service uses a soil capability classification system to indicate suitability of land for mechanized cultivation. This classification scheme groups soils into eight capability classes, in which Classes I-III are considered reasonably well adapted to agriculture, Class IV is marginal, and Classes V through VIII have severe limitations for such use.

According to the 1958 SCS soil capability inventory, 41 percent of the inventory acreage in the Ozark Region is in Classes I-III, compared with the national figure of 44 percent (table 10). 8/

The Missouri Ozarks, with 32 percent of its inventory land in Classes I-III, has the smallest proportion of adaptable land in the region. In the Oklahoma and Arkansas portions of the region, which include considerable areas in the Arkansas River Valley, 44 and 48 percent, respectively, of the inventory land is in Classes I-III.

Federally owned land in the Ozarks, most of which was excluded from the SCS soil capability inventory, totals approximately 4.9 million acres. Nearly 4 million acres of the federally owned land, largely of Class V-VIII quality, is in National Forests.

8/ Inventory acreage includes all land except (a) urban and built-up areas, (b) land owned by the Federal Government other than cropland operated under lease or permit, (c) water areas of less than 40 acres in size and less than one-eighth mile in width. Larger water areas are not included in total land area. Eighty-eight percent of the land in the Ozark Region was included in the SCS inventory. Sixty-four percent of the inventory acreage was in farms, compared with 56 percent of the total land area in the region.

Table 10.--Inventory acreage, by SCS land-capability class, Ozark Region, Appalachia, and United States, 1958 and 1959 1/

Item	Inventory acreage 2/	Classes I-III		Class IV		Classes V-VIII	
		Area	Share	Area	Share	Area	Share
	1,000 acres	1,000 acres	Percent	1,000 acres	Percent	1,000 acres	Percent
United States	1,452,873.0	638,009.0	43.9	169,181.0	11.6	645,683.0	44.4
Appalachia	87,888.0	27,035.0	30.8	11,880.0	15.4	48,973.0	55.7
Ozark Region	45,586.0	18,687.8	41.0	6,008.6	13.2	20,889.6	45.8
Rural counties	40,905.4	16,307.6	39.9	5,488.7	13.4	19,109.1	46.7
Urban counties	4,680.6	2,380.2	50.9	519.9	11.1	1,780.5	38.0
Arkansas	15,321.9	7,344.7	47.9	1,594.2	10.4	6,383.0	41.7
Rural counties	13,797.1	6,546.7	47.5	1,455.2	10.6	5,795.2	42.0
Urban counties	1,524.8	798.0	52.3	139.0	9.1	587.8	38.6
Missouri	16,643.2	5,303.2	31.9	3,279.5	19.7	8,060.5	48.4
Rural counties	15,860.0	4,869.1	30.7	3,117.5	19.7	7,893.4	49.6
Urban counties	783.2	434.1	55.4	162.0	20.7	187.1	23.9
Oklahoma	13,620.9	6,039.9	44.3	1,134.9	8.3	6,446.1	47.3
Rural counties	11,248.3	4,891.8	43.5	916.0	8.1	5,440.5	48.4
Urban counties	2,372.6	1,148.1	48.4	218.9	9.2	1,005.6	42.4

1/ See Appendix B for urban and rural counties in region.
2/ Because of rounding, some totals may not equal the sum of the items listed.

Source: (2, 16, 40, 45).

A recent study of 2 million acres in northwest Arkansas, outside the Ozark National Forest, showed only 19 percent of the land in Classes I-III, and 11 percent in Class IV (5, p. 11).

The land capability classification does not indicate how the land has been used or the relative productivity of the land. Nearly 28 percent of the Class I-III land in the Ozark Region was in forest and woodland in 1958--the proportion was 39 percent in Arkansas. Not all of the land which is free of physical hazards to cultivation is productive enough and in tracts of sufficient size to make its cultivation economically feasible.

The acreage in farms in the Ozark Region stood at approximately 29,347,000 acres in 1959 and accounted for about 56 percent of the total area (table 11).

Table 11.--Land in farms, proportion of total land area in farms, and average size of farm, Ozark Region, Appalachia, and United States, 1950 and 1959 1/

Item	Land in farms, 1959		Change, land in farms	Average size of farm	
	Acreage	Proportion of total land area	1950-59 2/	1950	1959
	1,000 acres	Percent	Percent	Acres	Acres
United States	1,123,508	49.5	-3.3	215.3	302.4
Appalachia	42,958	43.6	-21.8	82.5	105.6
Ozark Region	29,347	56.4	-9.7	140.1	198.1
Rural counties	26,005	55.7	-10.2	142.9	200.5
Urban counties	3,342	62.8	-5.7	121.1	181.3
Arkansas	8,485	45.5	-16.6	116.2	167.1
Rural counties	7,696	45.9	-16.3	120.7	173.4
Urban counties	789	42.0	-18.9	86.0	123.4
Missouri	11,391	61.2	-10.9	144.8	182.4
Rural counties	10,735	60.4	-11.2	148.5	186.9
Urban counties	656	77.7	-6.6	101.1	130.2
Oklahoma	9,471	64.1	-0.9	170.2	271.3
Rural counties	7,574	62.2	-1.5	170.2	271.5
Urban counties	1,897	73.0	1.5	169.8	270.8

1/ See Appendix B for urban and rural counties in region.
2/ Difference in definition of farm in 1950 and 1959 Censuses affects comparisons.

Source: (15, 53, 54, 61, 62).

This was a 10 percent decline in farm acreage from 1950, which contrasts with declines of 3 percent in the United States and 22 percent in Appalachia.

Very little of the decrease of 3.2 million acres in "land in farms" in the Ozarks can be explained by urbanization. Reversion of lands to public ownership in the national forest areas, acquisition of land by the Corps of Engineers for reservoirs and similar developments, and the reduction due to the census definition of a farm account for a sizable portion of the change. 9/

The number of farms in the Ozarks declined 36 percent between 1950 and 1959 (table 12). Within the region, the greatest decrease was in Arkansas and the least in Missouri. Approximately one-half the total decline was due to changes in definition of a farm.

Number of commercial farms in the Ozark Region declined 43 percent in 1950-59 (table 12). During the same period, number of commercial farms declined 39 percent in Appalachia and 35 percent in the United States as a whole.

The average size of farms in the Ozark Region in 1959 was 198 acres--two-thirds the U. S. average and nearly twice the Appalachian average (table 11).

The change in farm size in 1950-59 was slightly greater in the Ozark Region than in the country as a whole. Increases averaged about 26 percent in Missouri, 44 percent in Arkansas, and 59 percent in Oklahoma.

The average size of commercial farms in the region increased about 54 percent in 1950-59, from 196 acres to 301 acres. Within the region the increases were 37 percent in Missouri, 52 percent in Arkansas, and 79 percent in Oklahoma. These farms in 1959 averaged 245 acres in Arkansas, 257 acres in Missouri, and 464 acres in Oklahoma. Commercial farms in the predominantly urban counties are smaller than those in the rural counties, but the 1950-59 increase in farm size was greater in urban than in rural counties. Despite these changes, farm size has increased too slowly to maintain adequate incomes and make efficient use of new technology.

Harvested cropland in the region in 1959 comprised about 4,752,000 acres, or 16 percent of the total land in farms (table 13). Harvested cropland was 22 percent of total farmland in Appalachia and nearly 28 percent of total farmland in the United States. The 58 acre increase in size of the average Ozark farm in 1950-59 included a 3-acre increase in harvested cropland.

The sharp decline in number and the equally significant increase in size of commercial farms in the Ozarks indicate consolidation of units. This may explain the shift from crop enterprises to beef cattle, or it may be that operators can increase their farm acreages only by shifting to beef cattle.

9/ The reversion of a considerable volume of cropland in the Ozarks to less intensive uses (about 2 million acres) may have taken a considerable acreage of land out of the "land in farms" class. There is an understatement of land in farms because on large farms with only small acreages in agricultural uses, forest and wasteland are not completely enumerated.

Table 12.--Number of farms by type of farm, Ozark Region, Appalachia, and United States, 1950 and 1959 1/ 2/

Item	All farms			Commercial farms				
				1950		1959		Change in number 1950-59
	1950	1959	1950-59	Farms	Percentage of all farms	Farms	Percentage of all farms	
	Number	Number	Percent	Number	Percent	Number	Percent	Percent
United States	5,382,162	3,703,894	-31.2	3,706,400	68.9	2,416,000	65.2	-34.8
Appalachia	n.a.	406,900	-38.8	303,800	45.7	184,800	45.4	-39.2
Ozark Region	231,980	148,138	-36.1	121,805	52.5	69,090	46.6	-43.3
Rural counties	202,701	129,699	-36.0	106,834	52.7	60,548	46.7	-43.3
Urban counties	29,279	18,439	-37.0	14,971	51.1	8,542	46.3	-42.9
Arkansas	87,492	50,770	-42.0	40,822	46.7	21,811	43.0	-46.6
Rural counties	76,164	44,373	-41.7	35,712	46.9	19,000	42.8	-46.8
Urban counties	11,328	6,397	-43.5	5,110	45.1	2,811	43.9	-45.0
Missouri	88,331	62,463	-29.3	52,798	59.8	31,242	50.0	-40.8
Rural counties	81,386	57,426	-29.4	48,658	59.8	28,837	50.2	-40.7
Urban counties	6,945	5,037	-27.5	4,140	59.6	2,405	47.8	-41.9
Oklahoma	56,157	34,905	-37.8	28,185	50.2	16,037	45.9	-43.1
Rural counties	45,151	27,900	-38.2	22,464	49.8	12,711	45.6	-43.4
Urban counties	11,006	7,005	-36.4	5,721	52.0	3,326	47.5	-41.9

-- Continued

Table 12.--Number of farms by type of farm, Ozark Region, Appalachia, and United States, 1950 and 1959 1/ 2/--Continued

Item	Noncommercial farms							
	Part-time farms				Other farms 3/			
	1950		1959		1950		1959	
	Farms	Percentage of all farms	Farms	Percentage of all farms	Farms	Percentage of all farms	Farms	Percentage of all farms
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
United States	639,200	11.9	884,800	23.9	1,033,600	19.2	407,200	11.0
Appalachia	110,300	16.6	154,600	38.0	251,100	37.7	67,100	16.5
Ozark Region	43,973	19.0	57,294	38.7	66,202	28.5	22,388	15.1
Rural counties	38,830	19.2	49,947	38.5	57,037	28.1	19,765	15.2
Urban counties	5,143	17.6	7,347	39.8	9,165	31.3	2,623	14.2
Arkansas	18,102	20.7	20,758	40.9	28,568	32.7	8,174	16.1
Rural counties	16,103	21.1	18,305	41.3	24,349	32.0	7,112	16.0
Urban counties	1,999	17.7	2,453	38.4	4,219	37.2	1,062	16.6
Missouri	15,094	17.1	21,727	34.8	20,439	23.1	9,760	15.6
Rural counties	13,930	17.1	19,817	34.5	18,798	23.1	9,035	15.7
Urban counties	1,164	16.8	1,910	37.9	1,641	23.6	725	14.4
Oklahoma	10,777	19.2	14,809	42.4	17,195	30.6	4,454	12.8
Rural counties	8,797	19.5	11,825	42.4	13,890	30.8	3,618	13.0
Urban counties	1,980	18.0	2,984	42.6	3,305	30.0	836	11.9

1/ See Appendix B for urban and rural counties in region.
2/ Difference in definition of farms in 1950 and 1959 Censuses affects comparisons.
3/ Residential, part-retirement, and abnormal farms.

Source: (15, 53, 54, 61, 62).

Table 13.--Harvested cropland as a percentage of total farmland, Ozark Region, Appalachia, and United States, 1950 and 1959 1/

Item	1950 2/		1959 2/	
	Harvested Cropland	Share of total farmland	Harvested Cropland	Share of total farmland
	1,000 acres	Percent	1,000 acres	Percent
United States.....	344,564	29.7	311,476	27.7
Appalachia.....	13,691	24.9	9,640	22.4
Ozark Region.....	6,761	20.8	4,752	16.2
Rural counties....	5,836	20.2	4,094	15.7
Urban counties....	925	26.9	658	19.7
Arkansas.....	1,952	19.2	1,183	13.9
Rural counties..	1,752	19.1	1,045	13.6
Urban counties..	200	20.6	138	17.5
Missouri.....	2,804	21.9	2,289	20.1
Rural counties..	2,523	20.9	2,051	19.1
Urban counties..	281	40.0	238	36.3
Oklahoma.....	2,004	21.0	1,280	13.5
Rural counties..	1,561	20.3	998	13.2
Urban counties..	443	23.7	282	14.9

1/ See Appendix B for urban and rural counties in region.
2/ Difference in definition of farm in 1950 and 1959 Censuses affects comparisons.

Source: (15, 53, 54, 61, 62).

Types of Farming

The acreage of harvested cropland in corn, cotton, and hay declined considerably in the 1950-59 decade in the Ozarks, although 361,000 more acres of soybeans were harvested. The proportion of commercial farms classed in the agricultural census as crop farms--field-crop and vegetable, fruit, and nut farms--declined from 21 percent to 15 percent during the 10-year period, while the proportion classed as livestock, poultry, and dairy farms increased from 64 percent to 78 percent. 10/

10/ Except for dairy farms, farms are classed according to the product or group of products accounting for 50 percent or more of the total value of farm products sold.

In the Arkansas area in 1959, one out of every five commercial farms was a poultry farm, 18 percent were dairy farms, and 36 percent were "other livestock" farms, mostly beef. Only 4 percent of the commercial farms in the Missouri area were poultry farms. Thirty-six percent were dairy farms and 44 percent were "other livestock" farms. Sixty-one percent of the commercial farms in the Oklahoma area in 1959 were "other livestock" units, mainly beef cattle, 2.5 percent were poultry farms, and 11 percent were dairy farms.

The share of all farm product sales derived from livestock in the Ozark Region increased from 75 percent in 1950 to 80 percent in 1959 (table 14).

Table 14.--Value of livestock and livestock products sold, Ozark Region, Appalachia, and United States, 1950 and 1959 1/

Item	Value of livestock and livestock products sold 2/				
	1950	1959	Increase 1950-59	As share of all farm products sold	
				1950	1959
	1,000 dollars	1,000 dollars	Percent	Percent	Percent
United States	12,197,274	17,045,431	39.7	54.9	55.9
Appalachia	559,606	934,706	67.0	62.0	69.0
Ozark Region 3/	266,923	436,810	63.7	74.7	80.2
Rural counties	224,083	370,300	65.3	77.7	80.9
Urban counties	42,840	66,510	55.3	74.6	76.8
Arkansas 3/	73,906	153,276	107.4	64.5	77.8
Rural counties	57,388	121,863	112.4	61.6	76.8
Urban counties	16,517	31,413	90.2	77.1	82.3
Missouri 3/	133,915	183,160	36.8	86.1	83.9
Rural counties	119,889	167,723	40.0	86.9	85.1
Urban counties	14,026	15,438	10.1	80.1	73.2
Oklahoma 3/	59,102	100,373	69.8	67.8	77.7
Rural counties	46,805	80,714	72.5	68.2	79.3
Urban counties	12,297	19,659	59.9	66.4	71.7

1/ See Appendix B for urban and rural counties in region.
2/ Values have not been adjusted for price changes.
3/ Because of rounding, some totals may not equal the sum of the items listed.

Source: (15, 53, 54, 61, 62).

Farms with gross sales of $10,000 or more would normally provide more than the proverty-level family income from product sales alone. 11/ In 1959, 16 percent of the commercial farms in the Ozark Region were in this category, about the same as in Appalachia (table 15). The proportion ranged from 13 percent in the 42 predominantly rural Missouri counties to 31 percent in the 4 Arkansas urban counties. Urban counties in the region generally had a greater share of the commercial farms in the higher sales category.

Fifty-eight percent of the commercial farms in the Ozarks had gross sales of $2,500 to $9,999 in 1959 compared with 48 percent in Appalachia. The Ozark Region was below Appalachia in the proportion of commercial farms with less than $2,500 in sales of farm products--26 percent compared with 35 percent.

The Ozarks made greater gains in the proportion of commercial farms in the $10,000-and-over sales category in 1950-59 than did Appalachia or the country as a whole--nearly a five-fold increase during the decade. The proportion in Appalachia was four times as high in 1959 as in 1950, and in the United States it was two and one-half times as high.

The proportion of part-time farms more than doubled in the Ozarks, in Appalachia, and the United States in 1950-59. 12/ In the Ozarks in 1959, 39 percent of all farms were part-time farms. Much of the off-farm work performed by the part-time farmers is public work on the roads or driving school buses, or timber work. There is some employment in fishing- and hunting-guide services, float-fishing businesses, and other recreation enterprises. A part-time farmer who depends on beef cattle for farm income works relatively few hours at farmwork and can easily manage his livestock and hold an off-farm job.

The total number of cattle in the Ozark Region increased 20 percent in 1950-59. However, the composition of cattle inventories changed significantly during this period. Number of beef cows more than doubled while number of milk cows declined about one-third. The greatest change occurred in Oklahoma and the least in Missouri. The relatively greater shift from milk cows to beef cows in the urban counties indicates a shift to labor-extensive enterprises as off-farm employment opportunities were presented.

Hog production is declining in the Ozarks. In contrast to the 22-percent and 11-percent increases in number of hogs in the United States and Appalachia, the number in the Ozark Region declined about 10 percent in 1950-59. The 42-percent decline in number of hogs in Oklahoma and the 23-percent decline in Arkansas were partly offset by a 16-percent increase in the Missouri Ozarks. Proximity to the Corn Belt gives southern Missouri a competitive advantage over other Ozark areas in producing feeder pigs.

11/ Poverty-level family income is defined as less than $3,000 net cash income.

12/ A part-time farm, according to the 1959 Census of Agriculture (62), was a farm with a value of sales of farm products of $50 to $2,499 whose operator was under 65 years of age and either worked off the farm 100 or more days or had income, together with that of members of his household, from nonfarm sources greater than the total value of farm products sold.

Table 15.--Number and percentage of commercial farms with gross sales of specified value, Ozark Region, Appalachia, and United States, 1950 and 1959 1/ 2/

Item	Sales greater than $10,000				Sales from $5,000 to $9,999			
	1950		1959		1950		1959	
	Farms	Percentage 3/	Farms	Percentage 3/	Farms	Percentage 3/	Farms	Percentage 3/
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
United States	484,400	13.1	795,500	32.9	721,200	19.5	653,900	27.1
Appalachia	12,100	4.0	31,500	17.1	27,200	9.0	35,800	19.3
Ozark Region 4/	4,104	3.4	11,322	16.4	9,276	7.6	15,290	22.1
Rural counties	3,174	3.0	9,393	15.5	7,629	7.1	13,211	21.8
Urban counties	930	6.2	1,929	22.6	1,647	11.0	2,079	24.3
Arkansas 4/	1,635	4.0	4,615	21.2	2,665	6.5	4,137	19.0
Rural counties	1,169	3.3	3,735	19.7	2,011	5.6	3,491	18.4
Urban counties	466	9.1	880	31.3	654	12.8	646	23.0
Missouri 4/	1,510	2.9	4,210	13.5	4,491	8.5	7,520	24.1
Rural counties	1,285	2.6	3,712	12.9	3,921	8.1	6,759	23.4
Urban counties	225	5.4	498	20.7	570	13.8	761	31.6
Oklahoma 4/	959	3.4	2,497	15.6	2,120	7.5	3,633	22.7
Rural counties	720	3.2	1,946	15.3	1,697	7.6	2,961	23.3
Urban counties	239	4.2	551	16.6	423	7.4	672	20.2

Item	Sales from $2,500 to $4,999				Sales less than $2,500			
	1950		1959		1950		1959	
	Farms	Percentage 3/	Farms	Percentage 3/	Farms	Percentage 3/	Farms	Percentage 3/
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
United States	882,300	23.8	617,700	25.6	1,618,500	43.7	349,000	14.4
Appalachia	50,500	16.7	53,300	28.8	212,800	70.3	64,300	34.8
Ozark Region 4/	23,303	19.1	24,533	35.5	85,122	69.9	17,945	26.0
Rural counties	20,167	18.9	21,644	35.8	75,864	71.0	16,300	26.9
Urban counties	3,136	21.0	2,889	33.8	9,258	61.8	1,645	19.3
Arkansas 4/	6,242	15.3	6,387	29.3	30,280	74.2	6,672	30.6
Rural counties	5,425	15.2	5,663	29.8	27,107	75.9	6,111	32.2
Urban counties	817	16.0	724	25.8	3,173	62.8	561	20.0
Missouri 4/	11,787	22.3	12,454	39.9	35,010	66.3	7,058	22.6
Rural counties	10,565	21.7	11,548	40.1	32,887	67.6	6,818	23.6
Urban counties	1,222	29.5	906	37.7	2,123	51.3	240	10.0
Oklahoma 4/	5,274	18.7	5,692	35.5	19,832	70.4	4,215	26.3
Rural counties	4,177	18.6	4,433	34.9	15,870	70.7	3,371	26.5
Urban counties	1,097	19.2	1,259	37.9	3,962	69.3	844	25.4

1/ See Appendix B for urban and rural counties in region.
2/ Difference in definition of farms in the 1950 and 1960 Censuses affects comparisons. Also, value has not been adjusted for price changes.
3/ Percentage of all commercial farms.
4/ Because of rounding, some totals may not equal the sum of the items listed.

Source: (15, 53, 54, 61, 62).

Ewe flocks expanded 8 percent in the Ozarks from 1950 to 1959, but the total number of ewes was less than 150,000 in 1959. United States inventories were up nearly 6 percent in the same period. Number of ewes in Appalachia declined slightly from 1950 to 1959, but there were still nearly 600,000 in 1959. The prevalence of predators, the type of land cover, the lack of adequate buildings, and the greater grain requirements for sheep than for other livestock partly explain the small number of sheep in the Ozarks.

The broiler industry in the Ozarks accounted for about 12 percent of the commercial broiler production in the United States in 1959 and for nearly 90 percent of the broilers produced in Arkansas, Missouri, and Oklahoma. In contrast, the Appalachian region produced nearly 29 percent of the national total.

Increases in broiler production in the Ozarks nearly paralleled those in Appalachia in 1954-59, more than doubling, but this was more than the increase in the United States. Most of the 1954-59 gain in production of Ozark broilers was in the rural counties of Arkansas. Commercial egg production is small in the Ozarks, but is expanding. In the Arkansas Ozarks, egg production in 1959 was more than three times that in 1954.

Capital Accumulation

The portion of the "total investment in land and buildings" attributable to buildings is relatively small in the Ozark Region. In fact in some cases of unit consolidation in the region, acquired buildings may actually have negative value. The average value of land and buildings in the region in 1959 was $12,721 per farm or about $64 per acre. This compares with $12,032 per farm or about $114 per acre in Appalachia, and $33,173 per farm or about $110 per acre in the United States as a whole (table 16). The 1950-59 increase in the investment in land and buildings per farm in the Ozarks was considerably greater than the increase in farm size for the same period--farm size increased 41 percent, and investment in land and buildings, 135 percent. However, the investment per acre in the Ozark Region in 1950 was about $39 per acre compared with $72 in Appalachia and $65 for the United States. The percentage increase in value of this investment per acre in 1950-59 was about 66 percent in the Ozarks, 70 percent in the United States as a whole, and 57 percent in Appalachia.

The livestock enterprises that dominate the agriculture of the Ozark Region are less capital-intensive than most crop enterprises. However, to the extent that capital rationing has hindered farm enlargement and enterprise reorganization, shortages have penalized Ozark farm operators. On the other hand, farmers with pasture have had little difficulty in obtaining adequate credit to purchase stock cattle. The Farmers Home Administration has actively provided capital for increasing the size of farm enterprises. In an 8-county area in North Central Arkansas, the outstanding balance on operating loans

Table 16.--Value of investment in land and buildings per farm, Ozark Region, Appalachia, and United States, 1950 and 1959 1/ 2/

Item	All farms		Commercial farms	
	1950	1959	1950	1959
	Dollars	Dollars	Dollars	Dollars
United States	13,911	33,173	17,696	44,439
Appalachia	5,978	12,032	7,736	16,416
Ozark Region	5,412	12,721	7,313	19,198
Rural counties	5,190	12,124	7,017	18,233
Urban counties	6,946	16,921	9,429	26,043
Arkansas	4,981	11,118	6,730	16,796
Rural counties	4,758	10,633	6,400	15,997
Urban counties	6,476	14,479	9,040	22,199
Missouri	5,730	12,065	7,354	17,044
Rural counties	5,434	11,375	7,005	16,032
Urban counties	9,199	19,935	11,456	29,175
Oklahoma	5,583	16,226	8,081	26,663
Rural counties	5,479	16,036	8,022	26,567
Urban counties	6,008	16,984	8,311	27,028

1/ See Appendix B for urban and rural counties in region.
2/ Difference in definition of farm in 1950 and 1960 Censuses affects comparisons. Value has not been adjusted for price changes.

Source: (15, 53, 54, 61, 62).

increased about 165 percent in 1960-63. 13/ In view of the qualifications for FHA loan eligibility, the increase implies that this agency is providing credit for needs not otherwise met by conventional credit sources.

Capital accumulation in Ozark agriculture from farm-product sales is extremely slow. In 1959, the average value of all farm products sold in the region was only $3,675 per farm or about 45 percent as high as the U. S. average of $8,218. In general, about one-third of the returns from sale of products is available for capital accumulation and consumption. Income from off-farm employment is subsidizing agriculture in the region. Forty percent of the Ozark farm operators worked off-farm 100 days or more in 1959 (table 17).

13/ The unpaid principal balance on loans increased from $592,133 on June 30, 1960, to $1,568,156 on June 30, 1963, in the area composed of Baxter, Boone, Izard, Marion, Newton, Searcy, and Stone Counties. Source: Arkansas State Director's Office of Farmers Home Administration, Little Rock, Ark.

Table 17.--Percentage of farm operators with off-farm employment and of farm families with other income greater than value of farm products sold, Ozark Region, Appalachia, and United States, 1950 and 1960 1/ 2/

Item	All farms				Commercial farms			
	Farm operators working off-farm 100 days or more		Families with other income greater than value of farm products sold		Farm operators working off-farm 100 days or more		Families with other income greater than value of farm products sold	
	1950	1959	1950	1959	1950	1959	1950	1959
	Percent							
United States	23.9	29.9	29.1	35.8	9.3	14.5	9.1	12.5
Appalachia	32.1	37.5	44.1	51.2	9.0	14.9	12.2	15.3
Ozark Region	25.7	39.9	42.3	53.8	8.4	18.5	11.6	18.8
Rural counties	24.6	39.0	42.0	53.4	8.2	18.1	11.5	18.0
Urban counties	32.9	46.1	44.1	57.0	10.1	21.2	12.7	24.1
Arkansas	27.4	39.9	46.3	56.4	8.0	16.5	12.5	18.0
Rural counties	26.3	39.4	46.4	55.9	7.4	16.1	12.0	16.7
Urban counties	34.5	43.2	45.4	60.5	12.1	19.3	15.5	26.5
Missouri	24.6	37.6	36.8	50.6	8.5	18.6	10.4	18.9
Rural counties	23.6	36.9	36.4	50.4	8.7	18.2	10.7	18.6
Urban counties	35.4	46.3	41.7	53.7	6.3	22.8	7.5	22.7
Oklahoma	24.7	44.0	44.7	55.8	8.9	20.9	12.7	19.5
Rural counties	23.5	42.8	44.8	55.7	8.3	20.7	12.4	18.6
Urban counties	29.8	48.7	44.4	56.3	11.1	21.6	14.1	23.1

1/ See Appendix B for urban and rural counties in region.
2/ Difference in definition of farm in 1950 and 1960 Censuses affects comparisons.

Source: (15, 53, 54, 61, 62).

In the 11 urban counties, 46 percent of the operators worked off-farm 100 days or more. About 30 percent of the operators in the United States reported this much time in off-farm work.

Over half the farm-operator families had other income exceeding the value of farm products sold in 1959, more than in Appalachia or the United States as a whole. The proportion was higher in urban Ozark counties than in rural counties--57 percent compared with 53 percent. In urban counties in the Arkansas Ozarks, the proportion was about 61 percent.

In an effort to have adequate family incomes, members of farm-operator families have actively sought off-farm employment. In many cases female members of the operator's family also sought employment in recreation jobs or in the low-skill manufacturing jobs available to women in some rural areas. Nonfarm employment of family members has reduced consumption out of agricultural inventories and has improved opportunities to accumulate capital.

Human Resources in Agriculture

The rural farm population in the Ozark Region numbered nearly 414,000 in 1960, or 18 percent of the population--a much higher proportion than in Appalachia or the United States as a whole (table 18). In the rural Ozark counties, 25 percent of the population were farm residents in 1960. The proportion was highest in the 42 rural counties of Missouri, where nearly 29 percent of the population lived on farms. The rural farm population of the Ozarks, like that of the rest of the country, declined sharply in the 1950's.

While adjustments out of agriculture in the Ozarks have lagged about 10 years behind those in Appalachia and the United States as a whole, the transition continues. 14/ Nearly one-third (31 percent) of the civilian labor force in the region were employed in agriculture in 1950 (55). By 1960, only 14 percent were employed in agriculture (68).

One of the barriers to rapid migration out of agriculture in the Ozarks is the farm-operator age structure. The average age in 1960 was 52. Persons at this age are not readily employable in nonfarm jobs, especially with the limited education and lack of marketable skills typical of Ozark agricultural workers and farm operators.

Approximately 10 percent of the 1960 rural farm population 25 years of age and over in the Ozark Region had less than 5 years of formal education (68). Only about 22 percent had completed high school and 2 percent were college graduates.

The low agricultural incomes and limited nonagricultural employment opportunities in the region prevent many farm operators from enjoying levels of living comparable to those of rural farm families in the rest of the Nation or Appalachia. Based on a 1959 U. S. index of 100, the average farm operator

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14/ The 18 percent of the Ozark Region's population on farms in 1960 compares with 21 percent and 15 percent on farms in 1950 in Appalachia and the United States, respectively (15, 55, 68).

Table 18.--Distribution of urban, rural nonfarm, and rural farm population, Ozark Region, Appalachia, and United States, 1950 and 1960 1/ 2/

Item	Urban		Rural nonfarm		Rural farm	
	1950	1960	1950	1960	1950	1960
	Percent					
United States	64.0	69.9	20.7	22.6	15.3	7.5
Appalachia	45.6	49.1	33.2	41.9	21.2	9.0
Ozark Region	33.3	39.4	27.6	42.2	39.0	18.4
Rural counties	17.9	21.8	31.8	53.0	50.3	25.2
Urban counties	65.9	70.8	18.8	23.0	15.3	6.2
Arkansas	38.4	47.5	25.4	37.7	36.1	14.8
Rural counties	19.2	25.3	30.8	51.4	50.0	23.3
Urban counties	70.9	75.5	16.4	20.4	12.7	4.1
Missouri	28.6	32.2	28.1	44.9	43.3	22.9
Rural counties	15.2	17.3	32.0	54.1	52.8	28.6
Urban counties	71.2	74.4	15.7	18.8	13.1	6.8
Oklahoma	31.2	35.6	30.5	46.3	38.3	18.0
Rural counties	19.9	23.9	33.1	53.5	47.0	22.5
Urban counties	52.8	56.8	25.5	33.3	21.6	9.9

1/ See Appendix B for urban and rural counties in region.
2/ Difference in definition of farm in 1950 and 1960 Censuses affects comparisons.

Source: (15, 55, 68).

level-of-living index for the Ozark Region was 68 in 1959, compared with 72 in Appalachia (table 19). The improvement between 1950 and 1959 was less in the Ozarks than in Appalachia. Arkansas had the lowest average indexes of the Ozark areas in both 1950 and 1959.

Shifts out of agriculture have been more rapid in the rural counties than the urban counties. Off-farm employment opportunities were better in the urban counties, and off-farm income frequently subsidizes the agricultural operation and thus retains the agricultural dependence of rural families.

Agricultural Problems and Potentials

With the extensive type of agriculture in the Ozarks, returns per acre are relatively low, and large acreages are required to yield enough income to support a family. On the other hand, labor requirements per unit of livestock,

Table 19.--Farm operator level-of-living indexes, 1/ Ozark Region, Appalachia, and United States, 1950 and 1959 2/

(U.S. index 1959=100)

Item	1950	1959
United States	59	100
Appalachia	34	72
Ozark Region	32	68
Rural counties	31	67
Urban counties	40	83
Arkansas	26	60
Rural counties	24	58
Urban counties	38	78
Missouri	40	74
Rural counties	39	73
Urban counties	60	100
Oklahoma	31	72
Rural counties	30	70
Urban counties	35	81

1/ Indexes are averages of county indexes, unweighted for differences in the number of farms.

2/ Difference in definition of farm in 1950 and 1960 Censuses affects comparisons. See Appendix B for urban and rural counties in region.

Source: (18).

especially beef cows, are small. Hence, a large investment in land and livestock is required to keep the farm family fully employed. Farm families with limited capital and surplus labor often seek off-farm employment to supplement farm incomes or to accumulate capital to enlarge the farm business.

The intensity of agricultural activity in the Ozarks is indicated by figure 3. The counties with $18,000 or more in farm product sales per 1,000 acres of total land area are predominantly dairy and poultry areas. Butler County, Mo., and Lawence County, Ark., are exceptions in which cotton and soybeans account for a large volume of sales.

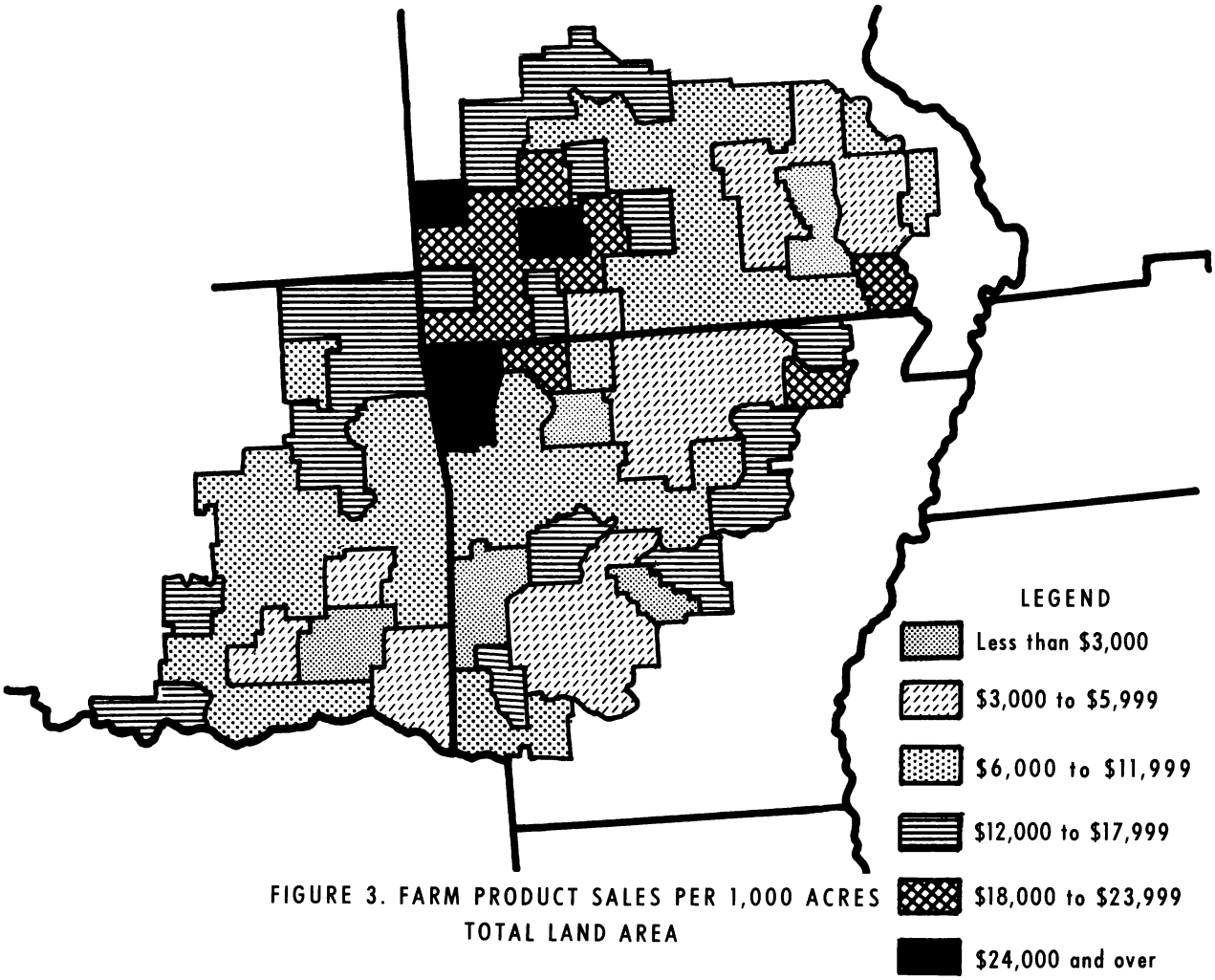

FIGURE 3. FARM PRODUCT SALES PER 1,000 ACRES TOTAL LAND AREA

Most of the Class I-III land in timber is in small isolated tracts not economically cultivable. The potential for cultivated crops in the region is restricted largely to the Arkansas River Valley and the prairie counties on the boundaries of the Ozark Region. These are areas with relatively large percentages of open Class I-III land (figure 4). In six of the counties, largely border counties, 60 percent or more of the 1958-59 inventory acreage was in Class I-III land. In 40 counties, less than 20 percent was in open Class I-III land. These 40 counties make up the Salem Plateau and the Boston and Ouachita Mountains.

The shift in crop production to hay and forage crops should continue with the trend toward larger farms, increasing recognition of erosion and soil structure problems, and more livestock production.

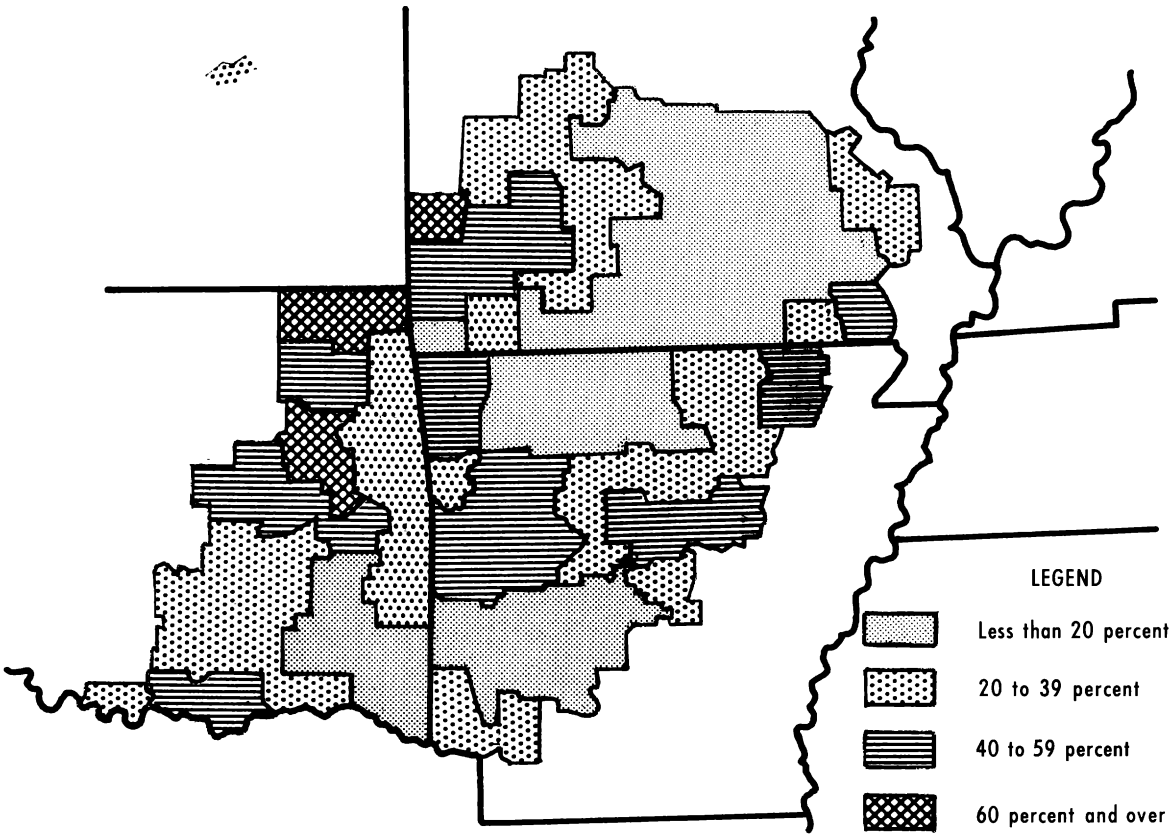

Figure 4. Percent of Inventoried Class I-III Land not in Forest

If substantial investments are made in farming in the region, capital must come from sources other than farming in the area. Operators with above-average managerial ability will accumulate capital slowly if the only sources are borrowing and savings from current farm income.

Among the alternative livestock enterprises suited to the region, the production of feeder calves is best adapted to part-time farming. This enterprise utilizes large quantities of forages economically produced in the region. Dairying also utilizes these forages, but economical dairy units are full-time enterprises requiring above-average managerial ability and considerable capital.

Expansion of poultry production offers limited opportunities in the region. High capital requirements and the competitive market structure of the vertically integrated poultry industry limit expansion. Producer margins are relatively narrow and a large capacity is necessary to obtain production contracts.

THE RECREATION-RELATED INDUSTRY

Recreation-Related Resources

The Ozark Region has many resources for a variety of activities in outdoor recreation. The scenic mountains and forests of the region contrast with its large manmade reservoirs and rivers.

Approximately 5.5 million acres of the region were in 197 public outdoor recreation areas in 1960 (table 20), and more areas have been added. Private recreation areas have also been developed.

The region's road network provides fair access to the major reservoirs, but most scenic areas are relatively inaccessible. The greatest concentration of urban recreation seekers is outside the region, and roads giving access to the full range of the region's facilities are essential for development of these recreation resources. Some of the roads through scenic areas might themselves be developed into recreation attractions.

Figure 5 shows the location of some public recreation areas in the region and population centers. This map does not show facilities of the National Park Service, U. S. Fish and Wildlife Service, State Park agencies, State Fish and Game agencies, or other State and local agencies.

Recreation faeilities in particular sections of the region are likely to be frequented by persons from particular geographic areas. In 1960, one-third of the visitors to the Lake of the Ozarks and the Big Springs-Clearwater-Wappapello areas were from Illinois and St. Louis--the major origin (9, p. 11). In 1960, 28 percent of the visitors to lakes in the White River area (Table Rock, Taneycomo, Bull Shoals, and Norfork) were from Kansas City and the State of Kansas.

Over one-third of the out-of-State visitors to the northeastern Oklahoma lakes (Grand, Fort Gibson, and Tenkiller) were from Kansas and Missouri in 1959-60 (19, p. 14). The Lake Texoma area is frequented by residents of Dallas and Fort Worth and other parts of Texas (20).

The Impact of Recreational Developments

Recreation contributes to the economic growth of the Ozarks. A study in 31 of the Ozark counties in Missouri found that recreation and tourism added nearly $70 million in gross volume of business and about 5,300 employees to the economy in 1959 (8). Approximately 22 percent of the $27 million total payroll of retail and service firms in the 31-county area resulted from tourism. Tourist-related businesses employed an estimated 2,200 part-time or full-time workers with payrolls totaling $2.5 million. Ninety-three percent of all the operators of trade and service firms reported that some of their business came from the tourist trade.

It is estimated that travelers spent $167 million in Arkansas in 1960 and $259 million in 1964 (4). In 1960, travel-serving businesses made about one-sixth of all retail trade and service sales, about one-half of which were

Table 20.--Inventory of public outdoor recreation areas by management agency, Ozark Region, 1960 1/

Item	National Park Service	U. S. Forest Service	U. S. Fish and Wildlife Service	U. S. Corps of Engineers	State Park Agency	State Fish and Game Agency	Other State agencies and authorities	Other local agencies	Total acreage
	Acres								
Ozark Region.....	5,407	3,929,404	45,355	636,466	88,262	511,112	237,403	32,714	5,486,123
Rural counties....	4,421	3,929,404	45,355	554,066	81,286	468,478	210,403	13,217	5,306,630
Urban counties....	986	-	-	82,400	6,976	42,634	27,000	19,497	179,493
Arkansas.....	5,197	2,382,219	6,870	251,090	18,789	52,923	27,000	16,527	2,760,615
Rural counties..	4,211	2,382,219	6,870	168,690	13,526	52,389	-	1,527	2,629,432
Urban counties..	986	-	-	82,400	5,263	534	27,000	15,000	131,183
Missouri.....	210	1,361,346	21,663	123,115	38,928	61,686	151,154	4,465	1,762,567
Rural counties..	210	1,361,346	21,663	123,115	38,928	61,686	151,154	-	1,758,102
Urban counties..	-	-	-	-	-	-	-	4,465	4,465
Oklahoma.....	-	185,839	16,822	262,261	30,545	396,503	59,249	11,722	962,941
Rural counties..	-	185,839	16,822	262,261	28,832	354,403	59,249	11,690	919,096
Urban counties..	-	-	-	-	1,713	42,100	-	32	43,845

1/ See Appendix B for urban and rural counties in region.

Source: (47).

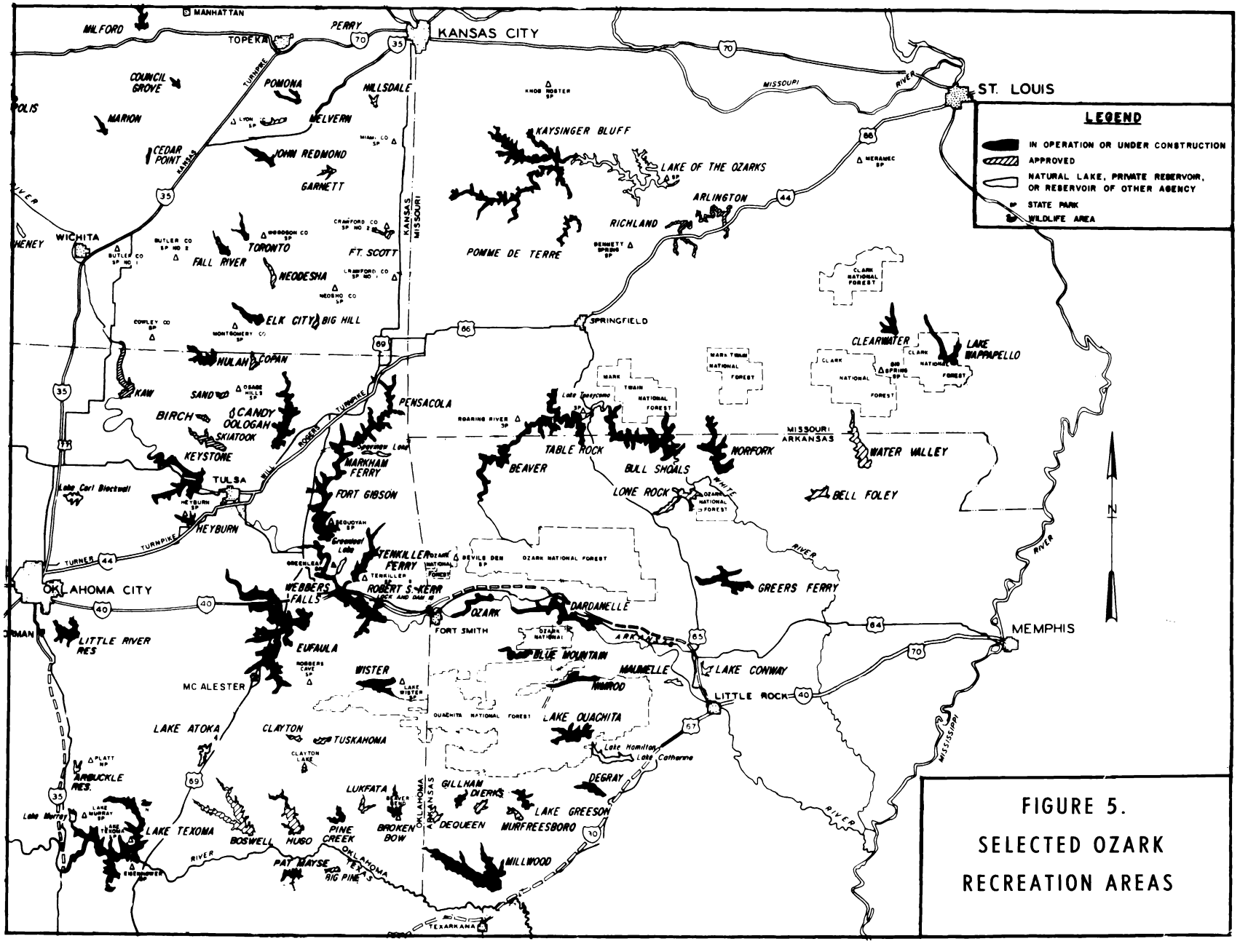

FIGURE 5.
SELECTED OZARK
RECREATION AREAS

to travelers. These businesses accounted for nearly one-third of the 1960 retail and service employment in the State. 15/

The total expenditures by out-of-State motorists in Oklahoma in 1959 were estimated at $141 million (20, p. 4). Approximately 31,000 persons in the State were engaged in activities supported wholly or in part by these expenditures.

The major share of the recreation activity in all three States is located in the Ozarks.

Employment

To estimate the impact of recreation activity on employment in the region, the trade and service groups influenced by recreation expenditures were identified from previous research (8) as retail trade, repair services, other personal services, and entertainment and recreation enterprises. Repair services include service stations and garages. Hotels and motels are included in other personal services.

Any county adjacent to a reservoir with one-half million or more visitors in 1961 was classed as an "operating-reservoir" county. Those counties adjacent to reservoirs under construction and to small reservoirs were classed as "counties with reservoirs under construction."

An index of employment change was calculated for the counties of the region, expressing 1950-60 change in recreation-related trade and service employment as a percentage of the U. S. change. 16/ The index of employment change shows the effect of reservoirs within the region on recreation-related trades and services (table 21). Of the 27 reservoir counties, 70 percent had indexes above the median index of the region. 17/ This was the general pattern in all three States. 18/

Notable growth in employment in the trades and services related to recreation occurred in several rural counties which were not adjacent to a reservoir. The most striking changes were in Douglas and Pulaski Counties, Mo., and Atoka County, Okla. The increase in Douglas County was contributed by workers commuting to the Bull Shoals area. Fort Leonard Wood is in Pulaski County, and Atoka is on Highways 69 and 75 midway between Tulsa and Dallas. Texas, Shannon, Oregon, and Ripley Counties in the roughest portion of the Missouri

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15/ This employment is that trade and service employment which is "export," i.e., services bought by tourists from outside the region. Autonomous recreation within the region is not to be considered a tertiary industry, but primary.

16/ For method of calculating, see Appendix A.

17/ The weighted indexes of rural nonreservoir and reservoir counties are similar because there is a wide range among counties and a few populous counties have relatively heavy weights. The median index for the region was 132 but the weighted index was only 114.2. Only one-fifth of the counties ranked below the weighted index.

18/ Moore reached a similar conclusion using different procedures (41).

Table 21.--Median county indexes of change in employment and sales and receipts in recreation-related trades and services, Ozark Region, 1950 to 1960 and 1954 to 1963

Area, and county classification 1/	Counties	Median indexes of change (U.S.=100)	
		Employment	Sales
	Number		
Ozark counties	115	132	99.8
Operating reservoir 2/	27	147	109.1
Reservoir under construction 3/	18	121	100.7
Nonreservoir	70	127	97.6
Rural	63	132	97.7
Urban	7	96	86.9
Arkansas counties	42	124	108.5
Operating reservoir 2/	7	146	130.0
Reservoir under construction 3/	12	121	105.1
Nonreservoir	23	124	111.9
Rural	21	128	115.1
Urban	2	94	102.3
Missouri counties	44	136	97.6
Operating reservoirs 2/	11	147	107.2
Reservoir under construction 3/	1	141	104.6
Nonreservoir	32	132	95.7
Rural	30	133	95.7
Urban	2	94	98.3
Oklahoma counties	29	128	89.4
Operating reservoirs 2/	9	152	94.5
Reservoir under construction 3/	5	119	99.8
Nonreservoir	15	126	89.0
Rural	12	130	90.5
Urban	3	102	85.6

1/ See Appendix B for urban and rural counties in region.

2/ Arkansas--Baxter, Boone, Pike, Fulton, Garland, Marion, Montgomery; Missouri--Barry, Benton, Camden, Hickory, Miller, Morgan, Ozark, Reynolds, Stone, Taney, Wayne; Oklahoma--Bryan, Cherokee, Delaware, LeFlore, Love, Marshall, Ottawa, Sequoyah, Wagoner.

3/ Arkansas--Benton, Cleburne, Hempstead, Howard, Johnson, Little River, Logan, Pope, Sevier, Van Buren, Washington, Yell; Missouri--St. Clair; Oklahoma--Haskell, McIntosh, Pittsburg, Nowata, Rogers.

Ozarks also had high indexes, as a result of National Forest and State recreation areas.

Sales and Receipts

Sales and receipts from recreation-related trades and services also indicate the importance of recreation to the economy of the region. An index of sales was computed, using 1954 and 1963 Census of Business data for approximately the same set of trades and services used in the employment-change index. 19/ Since data are for establishments, they show sales at the point of sale.

Reservoir counties as a group have a higher index of changes in sales from 1954 to 1963 than nonreservoir counties (table 21). The reservoir counties have a greater growth rate than the United States as a whole, despite the low incomes and the general decline in the labor force of these rural counties.

The sales indexes also were sensitive to construction projects in progress. The sales indexes were higher in counties in which reservoirs were under construction than in nonreservoir counties, except in Arkansas. The stage of construction of a reservoir at the time the census data were taken affects the index. When construction was at its peak, sales and receipts would be much greater than when only land acquisition and surveying were underway.

As the recreation facilities have grown, in some cases from modest fishing camps to elaborate recreation complexes, the income and employment multiplier effects of recreation and tourist expenditures have changed. More trade and service employees are needed to serve the patrons of family vacation facilities than those of the more primitive fishing camps, and expenditures in the local area are likewise larger (52, p. 4).

Part-Time Home Developments

An economic activity stimulated by the development of recreation facilities in the Ozarks is the establishment of part-time or summer homes in the recreation areas, part of a national trend toward second homes. 20/ Part-time home residents in the Missouri Ozarks spent approximately $1,200 per family in the area in 1960 for consumable items in addition to the investment in building or improving their homes, according to a recent study (7). Average sale value of the homes was about $7,500.

There were approximately 34,000 part-time homes in the Ozark Region in 1960--about 4 percent of all housing units (table 22). In 1960, about 8 percent of the housing units in the reservoir counties and about 3 percent of the units in nonreservoir counties were second homes. In the reservoir counties of Missouri, 17 percent were second homes.

19/ For method of calculating, see Appendix A.

20/ According to a recent estimate there are 65 million housing units in the Nation, including about 3.5 million second homes (5 percent of all units). Source: Mary Jane Ellis. Housing: Supplies, Prices and Outlook for 1966. Paper presented 43d Annual Agricultural Outlook Conference, November 17, 1965, Washington, D. C.

Table 22.--Part-time homes, Ozark Region, 1960 1/

Item	All housing units	Part-time units 2/	Part-time units as percentage of total
	Number	Number	Percent
Ozark Region	796,756	34,106	4.3
Reservoir counties	156,794	13,116	8.4
Nonreservoir counties	639,962	20,990	3.3
Arkansas	318,212	10,460	3.3
Reservoir counties	56,742	2,915	5.1
Nonreservoir counties	261,470	7,545	2.9
Missouri	288,281	15,992	5.5
Reservoir counties	37,623	6,488	17.2
Nonreservoir counties	250,658	9,504	3.8
Oklahoma	190,263	7,654	4.0
Reservoir counties	62,429	3,713	5.9
Nonreservoir counties	127,834	3,941	3.1

1/ See table 21, footnote 3, for reservoir counties (including those with reservoirs under construction).
2/ Part-time units were computed from the Census by adding units held for occasional use and seasonal units.

Source: (70).

Many heads of families who have second homes in the Ozarks are nearing retirement--63 percent of the owners in the Missouri study were 50 years of age or over and about 19 percent were 65 or over. Many have made their part-time homes in the Ozarks permanent residences when they retired, thus adding to the income of the local area.

Problems and Potentials of Recreation-Related Industry

The recreation industry offers a major opportunity for economic development of the region. With rising demand, existing recreation businesses can be expanded. There will also be an opportunity to fill this demand with new reservoirs, parks, and other developments in the future.

Anticipated Problems

The increase in income from recreation and retirement sources has a cost, however. The recreationists and retirees have specific needs for communication and medical facilities, roads, and other community services. These require

capital expenditures that the local communities must finance alone or with outside help.

Additional study is needed of special problems that come as recreation centers develop. The need for public health and welfare facilities, for instance, is obvious. In addition, to insure the integrity of the rural recreation area, measures relating to public health and sanitation need to be enacted and enforced within the areas.

Problems of zoning and home finance in rural recreation areas are especially important. Zoning is needed to insure orderly development and continued investment in rural recreation areas. There is need for financing methods tailored to the unique needs of owners of part-time and retirement homes in the recreation areas. Present insurance programs for homes and cabins not occupied during the whole year are inadequate, and insurance on equipment and against vandalism is hard to obtain. Law enforcement to protect person and property becomes a problem as the number of tourists and part-time residents increases.

Expected Growth

The trend in recreation is toward more family vacation facilities, in the region as in the rest of the country. The related trades and services sector of the economy will likely continue to grow more rapidly in the Ozark Region than in the United States as a whole. First, increased income in the region will result in greater per capita demands for services. Second, the population centers served by the region's recreation industry are growing. Also, retirement villages, which complement family recreation facilities, can be located in the same area, and will further increase need for services.

Emerging Recreation Centers

The recreation industry will likely be centered in locations having a concentration of activities. These centers of recreation activity will be interconnected, and connected with the outside. As they become recreationist drawing points, opportunities will expand for numerous small private businesses in adjacent areas and in-transit locations (6, 33).

Recreation centers have formed and are forming around the region's reservoirs, which are located principally in the predominantly rural counties. Centers will probably form around the new folk center in Stone County, Ark., the Ozark Rivers Monument area in Shannon, Ripley, and Oregon Counties, Mo., and the new Eufaula Reservoir area in McIntosh and Pittsburg Counties, Okla.

Existing recreation areas may be partly identified by the share of the labor force in recreation-related trades and services. This measure does not predict growth, since patterns of demand and access to various recreation areas change.

Percentages of the labor force employed in recreation-related trades and services were nearest the median in the counties with operating reservoirs and the urban nonreservoir counties--22.4 percent and 23.8 percent (table 23).

Table 23.--Share of civilian labor force in recreation-related trades and services, Ozark Region, 1960

Area, and county classification 1/	Counties	Median share of labor force
	Number	Percent
Ozark	115	19.7
Operating reservoir	27	22.4
Reservoir under construction	18	19.6
Nonreservoir	70	18.7
Rural	63	19.0
Urban	7	23.8
Arkansas counties	42	18.2
Operating reservoir	7	22.2
Reservoir under construction	12	18.0
Nonreservoir	23	18.1
Rural	21	17.8
Urban	2	23.1
Missouri counties	44	19.4
Operating reservoir	11	19.8
Reservoir under construction	1	19.5
Nonreservoir	32	19.3
Rural	30	19.1
Urban	2	24.1
Oklahoma counties	29	22.0
Operating reservoir	9	23.5
Reservoir under construction	5	22.0
Nonreservoir	15	21.3
Rural	12	21.3
Urban	3	23.1

1/ See Appendix B for urban and rural counties in region, and footnotes to table 21 for reservoir counties.

Source: (68).

The high proportion in the urban counties reflects nonrecreation consumption activities within the trade area. The highest share was in Garland County, Ark., an urban reservoir county, where 38 percent of the labor force was in recreation-related industry. Camden County, Mo., a predominantly rural county with an operating reservoir, had 35 percent in recreation-related industry in 1960. Twenty of the twenty-seven reservoir counties were above the median for the region.

As highly specialized recreation services develop, recreation will become a basic industry in the economy of the region. With existing or new interstate and access highways, the Ozarks should become the lake and mountain playground of the mid-continent.

FORESTRY

Timber Resources of the Region

Most of the Ozark Region is within the Southern Division of the Oak-Hickory Forest Region. A large part of the region is covered by a deciduous forest dominated by oaks with an abundance of hickories (11, p. 162).

Physiographic Areas

Salem and Springfield Plateaus.--Oak-hickory or oak-pine forest prevails over most of the area. However, mixed with the oaks, hickories, and pines are small areas similar to the more humid forests of the eastern United States. On dry ridges and southern exposures, post oak and blackjack oak of low commercial value are widespread. Sometimes these are associated with southern yellow pine, hickory, winged elm, and persimmon trees. The oak-pine association is more common on the flatter and rolling areas of the Ozark plateaus and near the western margin than in the more rugged parts.

White oak, a relatively valuable commercial species, is more abundant on the northern slopes. It is also found in the ridge and plateau forests along with black oak, post oak, and yellow pine. Redbud, dogwood, hop hornbeam, ironwood, mulberry, and service berry are understory trees in association with white oak.

Boston Mountains.--The prevailing forest in these mountains is the oak-hickory type with frequent pine and pine-oak areas. In the more moist sites, there are many types common to the Appalachian forests, as birch, sweetgum, sugar maple, chinquapin oak, basswood, umbrella magnolia, red oak, and American and winged elm. Some sites near streams have mixed mesophytic forests similar to the Cumberland and Allegheny plateaus (11, p. 172).

Ouachita Mountains and Arkansas River Valley.--The vegetation of this area is similar to that of the Ozark Uplands, but with yellow pine much more abundant. The pine-oak forest is the most widespread and extends over the bordering coastal plains of the south. The pine is an open forest in association with post oak, blackjack oak, black oak, white oak, and hickory.

Border Areas.--To the west of the Ouachita Mountains and Ozark Uplands is an area of forest-prairie transition of oak-hickory forest. Oaks are usually scrubby. The oaks are mainly post oak and blackjack except along the alluvial bottoms of the larger streams and on sheltered northern slopes, where the species are similar to those of the Ozark Uplands. South of the Ouachita Mountains the forest blends into the highly productive pine forests of the coastal plains.

Commercial and National Forests

In Arkansas, 69 percent of the Ozark area is woodland, and in Missouri 55 percent. The Missouri area includes five prairie counties with little woodland (table 24). Comparable data are not available for Oklahoma.

Table 24.--Land area and commercial forest, Ozark Region, specified years 1/

Item	All land	Commercial forest	
	1,000 acres	1,000 acres	Percent
Ozark Region	47,085.9	28,752.3	61.1
Urban counties	4,415.2	1,905.6	43.2
Rural counties	42,670.7	26,846.7	62.9
Arkansas (1959)	18,672.2	12,914.6	69.2
Missouri (1959)	18,615.3	10,205.7	54.8
Oklahoma (1955-56) 2/	9,798.4	5,632.0	57.5

1/ See Appendix B for urban and rural counties in region.
2/ Includes only 17 of the 29 counties. There is little forest area in the remaining counties.

Source: (24, 50, 76).

More than 7 million acres of the rougher lands in the region are within national forest boundaries--the Ozark in Arkansas, the Ouachita in Arkansas and Oklahoma, and the Mark Twain and Clark in Missouri. Of these 7 million acres, 4 million are administered by the U. S. Forest Service (table 25). Many of the timber sites in national forests have been under protection and management for half a century or more, with some of the best and most productive stands of timber in the region.

Growing Stock and Sawtimber Volume

The Arkansas portion of the region averages 464 cubic feet of growing stock per acre, considerably higher than the 286 cubic feet in Missouri and the 234 feet in Oklahoma (table 26). 21/ The heaviest stands of timber are in the Ouachita Mountains, with an average growing stock of 603 cubic feet, and the coastal plains, with an average of 824 cubic feet (50, p. 36). The stocking rate is considerably under what is considered the minimum for commercial timber management. Well-stocked stands of oak have from 1,100 to 2,400 cubic feet per acre.

21/ Growing stock is the net volume in cubic feet of live sawtimber trees and live pole-timber trees to a minimum 4-inch top inside bark. In softwoods only the bole is included, but in hardwoods both bole and limbs are included.

Table 25.--National forests in the Ozark Region, 1964

State and forest	Gross area within forest boundaries	Administered by U. S. Forest Service	Other lands within boundaries	Percentage administered by U. S. Forest Service
	Acres	Acres	Acres	Percent
Arkansas:				
Ozark.....	1,489,074	1,083,734	405,340	72.8
Ouachita.....	2,129,279	1,323,205	806,074	62.1
Missouri:				
Clark.....	1,816,302	760,019	1,056,283	41.8
Mark Twain...	1,191,331	602,324	589,007	50.6
Oklahoma:				
Ouachita.....	411,269	230,302	180,967	56.0
Total.....	7,037,255	3,999,584	3,037,671	56.8

Source: (75).

Per acre figures include timber sites of all types and situations, and tend to mask the wide divergence of stand quality; however, a large proportion of the region cannot support commercial-timber production under the present cost and price relationships. No studies are available to show the proportion of good forest land or the proportion which is so poor for forestry that there is no economic incentive to manage it for timber production.

A recent Arkansas study (29) covering 5 million acres in the Ozark Uplands classified 57 percent of the woodland as incapable of yielding usable wood products. 22/ Poor timber sites occupy almost two-fifths of the 5 million acres and more than half of the land now in timber. The chief contribution of the forest cover on these poor sites is site protection, flood prevention, and recreation. However, 43 percent of the present woodland, according to criteria of the Soil Conservation Service, is in good timber production sites. Although the study data refer to only 5 million acres in Arkansas, they are probably representative of the Boston Mountains, and the Ozark Uplands in Missouri and Oklahoma.

Because of the more heavily stocked stands in the Ouachita Mountains and the Coastal Plains, Arkansas averages about twice as much sawtimber per acre as Missouri and Oklahoma (table 26). The stands north of the Arkansas River are very similar to those in Oklahoma and Missouri.

22/ The Soil Conservation Service defined "forest range and pasture" as low-yielding forest land incapable of yielding usable wood products because of adverse site conditions but which is or may be developed for forest range or pasture.

Table 26.--Growing stock and sawtimber by species groups, Ozark Region, specified years 1/

Item	GROWING STOCK					
	All species	Softwoods 2/	Hardwoods			All species per acre
			Total	Soft	Hard	
	Mil. cu. ft.	Mil. cu. ft.	Mil. cu. ft.	Mil. cu. ft.	Mil. cu. ft.	Cubic feet
Ozark Region	10,225.9	3,695.3	6,530.6	773.7	5,756.9	355.6
Rural counties	9,660.3	3,455.6	6,204.7	726.1	5,478.6	359.8
Urban counties	565.6	239.7	325.9	47.6	278.3	291.6
Arkansas (1959)	5,991.3	2,915.9	3,075.4	539.4	2,536.0	463.9
Missouri (1959) 3/	2,918.4	284.8	2,633.6	132.7	2,500.9	286.0
Oklahoma (1955-56) 4/	1,316.2	494.6	821.6	101.6	720.0	233.7

Item	SAWTIMBER					
	All species	Softwoods 2/	Hardwoods			All species per acre
			Total	Soft	Hard	
	Mil. bd.-ft.	Mil. bd.-ft.	Mil. bd.-ft.	Mil. bd.-ft.	Mil. bd.-ft.	Board-feet
Ozark Region	28,742.0	14,605.0	14,137.0	9,518.6	4,618.4	1,012
Rural counties	27,257.9	13,662.4	13,595.5	9,198.3	4,397.2	1,023
Urban counties	1,484.1	942.6	541.5	320.3	221.2	844
Arkansas (1959)	18,750.1	11,904.7	6,845.4	4,175.8	2,669.6	1,452
Missouri (1959) 3/	5,975.8	707.6	5,268.2	4,323.2	945.0	606
Oklahoma (1955-56) 4/	4,016.1	1,992.7	2,023.4	1,019.6	1,003.8	713

1/ See Appendix B for urban and rural counties in region.
2/ Mostly shortleaf and loblolly pine, cypress, American red cedar.
3/ Excludes five prairie counties: Barton, Dade, Greene, Jasper, and Lawrence.
4/ Includes only 17 of the 29 counties.

Source: (25, 50, 76).

Forest Products Problems and Potentials

Much of the land in the Coastal Plain of Arkansas, the Arkansas River Valley, and the Ouachita Mountains offers a substantial long-range potential for development of forest and forest-products industries. The major problems are (1) the small size of the nonindustrial private holdings and their inadequate management, (2) the current lack of local markets for pulp, (3) the relatively high transportation costs for pulpwood, and (4) the depressed market for sawtimber. An adequate timber supply exists to supply pulp mills and other forest-products industries in this area that would complement the existing timber industries. There is also a potential for increased timber production.

Much of the woodland cover of the Ozark Uplands is on such poor sites that the potential for timber production is very low. Possible alternative uses for these sites include reforesting with desirable softwood stands or establishing natural forage covers for grazing. Either use requires removing the hardwood cover and idling the land for long periods. About 30 years are required for pine stands to reach pulp size on these sites, and about 4 years are required after initial seeding to establish a natural forage cover. Neither alternative appears to be economically feasible with present technology and the current high market price of land relative to its agricultural and timber productivity. Another barrier to timber production is the small size of holdings.

THE MINERAL RESOURCES OF THE REGION

The usefulness of a mineral deposit depends upon the demand for that mineral, the state of product and extraction technology, and the size and purity of the deposit in relation to other sources of supply. In addition, the extraction of minerals seldom produces any substantial employment unless complementary processing and manufacturing activities are located nearby.

Minerals are found in variety and abundance within the Ozark Region, although many of them have not yet been exploited. During 1953-63, minerals produced in the Missouri Ozarks decreased in value, while those in Arkansas and Oklahoma increased (table 27). The increase in the region was 13 percent, compared with 36 percent for the Nation.

Mineral Deposits

Each physiographic area in the region has characteristic mineral deposits. The location of most of these deposits is shown in figure 6.

Ozark Uplands

The principal mining operations in the Ozark Uplands have been for iron, manganese, lead, zinc, and barite. Iron is mined principally in southeastern Missouri, although there are several small operations throughout the southern and central parts of Missouri. Exploitation of large deposits of iron ores in southeastern Missouri has been extensive. About two-thirds

Table 27.--Value and relative importance of minerals produced, Ozark Region, 1953 and 1963 1/

Item	Value of minerals produced 1963	Value of minerals produced 1953	Change	Minerals produced, in order of importance, 1963
	1,000 Dollars	1,000 Dollars	Percent	
United States	19,620,000	14,382,000	36.4	
Ozark Region	202,681	179,323	13.0	
Rural counties	148,338	129,779	14.3	
Urban counties	54,344	49,544	9.7	
Arkansas	61,841	31,365	97.2	Stone, sand and gravel, natural gas, clay, coal, cement, gemstone, gypsum, lime barite, slate, petroleum, abrasive stone, phosphate
Missouri	38,619	51,196	-24.8	Sand and gravel, stone, iron ore, lead, copper, coal, lime, silver, clay, natural gas, barite, asphalt, limestone, zinc
Oklahoma	102,222	96,762	5.6	Petroleum, stone, natural gas, sand and gravel, coal, cement, clay, natural gas liquids, lime, zinc, lead, tripoli

1/ See Appendix B for urban and rural counties in region.

Source: (12, 35, 37, 51).

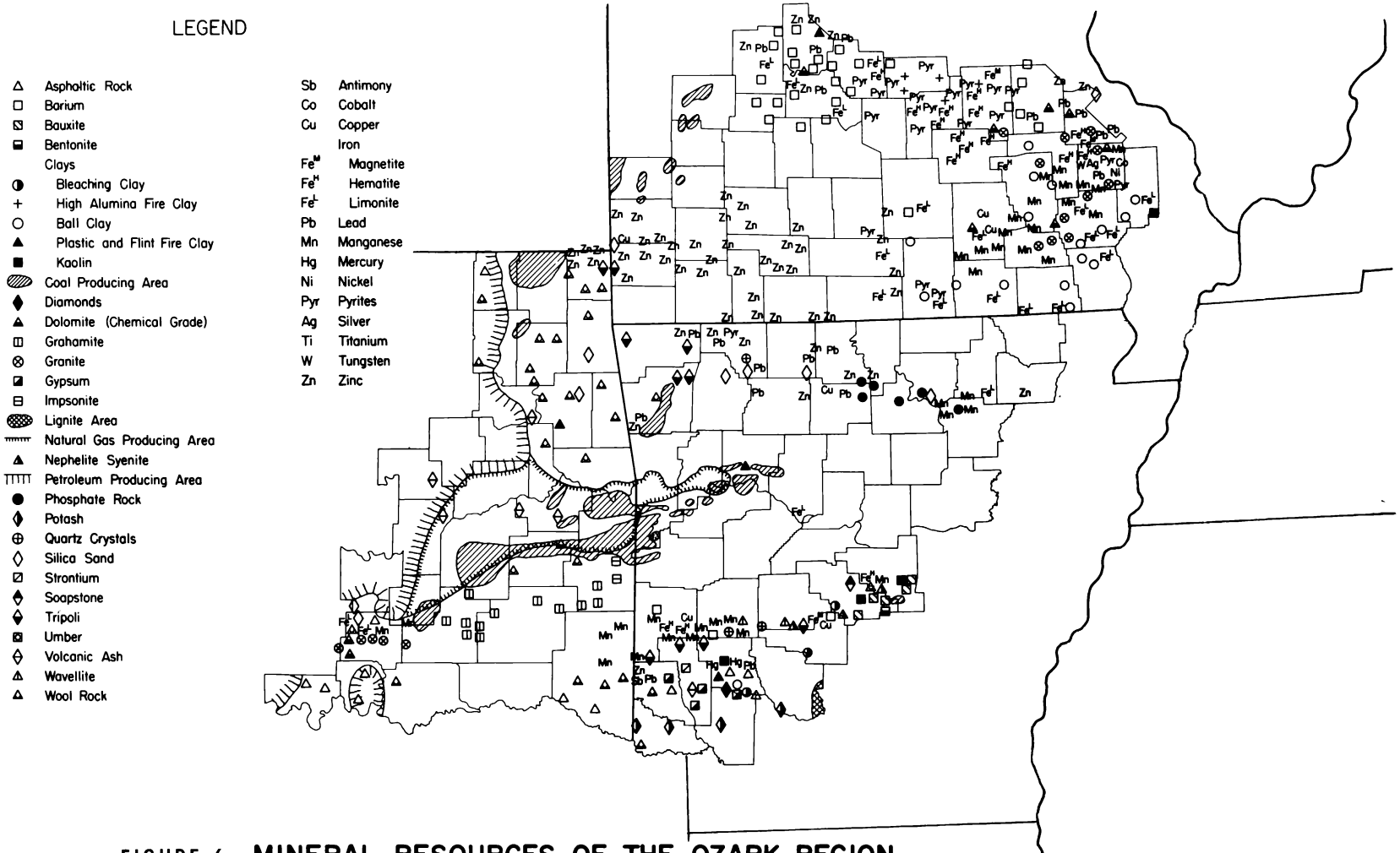

FIGURE 6. **MINERAL RESOURCES OF THE OZARK REGION**

Source: Midwest Research Institute, Copyright 1946

of the Missouri production comes from underground workings--an expensive method of mining iron (35, p. 12). The iron content of the concentrate, however, averaged 53 percent in 1963.

Independence County, Ark., is the site of one of the four largest manganese ore districts in the United States. The Arkansas deposit is low-grade ore, averaging about 5 percent (13, p. 498). Government stockpiling in the past has materially influenced operations of the marginal deposits.

The Ozark Uplands area of Missouri has been the Nation's leading lead producer for more than half a century (35, p. 15). Despite the problem of over-production within the industry, discovery and development of reserves, and expansion of mill capacity in the Viburnum District has continued.

Ottawa County, Okla., has major zinc operations, although the importance of zinc mining has declined in recent years. The 1958 production from this area was 53,014 short tons--about 12 percent of national production (13, p. 988). The zinc industry has been faced periodically with low prices, market instability, excessive stocks, and the threat of substitution (13, pp. 991, 993, 994).

Barite is mined in Washington, Jefferson, and St. Francois Counties, Mo., and in parts of Arkansas. Arkansas and Missouri combined produced two-thirds of the U. S. total in 1958 (13, p. 89).

Arkansas River Valley

The folded shales and sandstones of the Arkansas River Valley have deposits of coal, natural gas, sandstone, quartzite, lightweight aggregate materials, and building stone. Coal and natural gas are the most important.

Practically all the coal deposits of the Ozark Region are in the Arkansas River Valley in Arkansas and Oklahoma. Extensive deposits exist, but workings are small, other energy sources are cheap, and potential markets have closer supplies. Peak coal production in the region was reached about 1907 when Arkansas produced 2.7 million tons. Total production in the region through 1958 has been only about 300 million tons (13, p. 113).

The dry gas industry in the Arkansas portion of the Arkansas River Valley has aided considerably in the development of sections of the Ozark Region. Natural gas lines from the area serve the broiler industry in northwest Arkansas, as well as industries and homes in the valley. Production in 1958 was about 24 billion cubic feet, with reserves estimated at 804 billion cubic feet (77, p. 22). Exploration is continuing in the area.

Ouachita Mountains

The intensely folded and faulted shales and cherts of the Ouachita Mountains have a wide range of minerals. However, mining activities in the area are minor.

Border Areas

The border areas of the region contain scattered deposits of minerals. The petroleum operations on the western edge of the region and bauxite mining on the southern border are the major sources of mineral industry employment in those areas. Of the Nation's bauxite reserves, 97 percent are in the Arkansas portion of the region (13, p. 15). New technology that utilizes bauxitic clays of 35 percent alumina would increase the State's usable bauxite reserves from 50 million tons of 52 percent ore to 140 million tons (13, p. 21). The alumina reduction capacity in Arkansas, however, is only one-fifth of the U. S. capacity of 5.2 million short tons. Only 164,000 tons of the 2.6 million short ton aluminum capacity in the United States was located in Arkansas in 1958 (13, p. 17).

Employment in Mining

Mining in the Ozark Region accounted for less than 2 percent of employment in 1960 compared with 3.5 percent in Appalachia. The 1950-60 percentage loss of employment in mining was less in the Ozarks than in Appalachia--32 percent compared with 59 percent. In 1960, 2.7 percent of the labor force in Oklahoma was employed in mining, less than 1 percent in Arkansas, and 1 1/2 percent in Missouri.

Problems and Potentials of Mineral Resource Development

The major problems limiting extensive exploitation of the region's mineral resources are the modest size of the deposits, and their distance from consuming centers. Expansion of bauxite reduction and processing is also limited by the energy costs within the region.

Depressed markets for some of the minerals in the past have limited exploitation (13, p. 443). The chief problems of the lead and zinc industries are traceable to price declines due to overproduction after the cutback in Government stockpiling in 1957-58 (13, p. 430). The coal deposits are not likely to be fully utilized under present circumstances. Barge transportation on the Arkansas River, however, may open new markets for coal.

The low quality of some mineral deposits within the region limits expansion. The manganese deposits will not be worked to any great extent without improved technology to utilize low grade ore economically, or higher prices (13, p. 501).

The future of some of the mineral industries within the region is very bright. Increases in consumption, production, and imports are the trends in the barite industry. The only major problems are dependence upon a single market (90 percent is used in oil well drilling), and lack of additional barite deposits near consuming centers (13, p. 92). Iron ore production of the region will likely continue to increase to keep pace with the growing industrialization of the West and South. Shipments to eastern markets will also increase (13, p. 420). The natural gas industry in the Arkansas River Valley will also expand as exploration continues.

THE EMERGENCE OF MANUFACTURING INDUSTRIES

Share of the Labor Force in Manufacturing

Manufacturing industries employed only 12 percent of the Ozark labor force in 1950, less than one-half the proportion in the United States or Appalachia (table 28). The share had increased to 18 percent by 1960, compared with 26 percent in the United States.

Manufacturing in the region is dominated by agriculture-related industries. Lumber, wood products and furniture, and food and kindred products accounted for 50 percent of total manufacturing employment in 1950 and 40 percent in 1960 (table 29). In Arkansas, employment in manufacturing was greater in the rural than in the urban counties, reflecting the preponderance of agriculturally based manufacturing and the existence of developing employment centers not classified as urban. The manufacturing share in employment in Oklahoma was extremely low in both 1950 and 1960.

Manufacturing Employment Growth

The 1950-60 increase in share of the labor force employed in manufacturing reflected a 41-percent increase in number of employees in manufacturing industries--much greater than the increase in Appalachia and the country as a whole (table 9). This growth in manufacturing employment resulted both from a shift of industry into the region, and an expansion of existing industries.

Relative increases were largest in those industries with a rapid national growth. Employment in transportation equipment, electrical machinery, machinery other than electrical, fabricated metals, and motor vehicles and equipment expanded rapidly, but from an extremely small employment base (table 29). The greatest absolute employment increases were in three industry groups which are expanding their share of national employment quite slowly--apparel, food and kindred products, and "other nondurable goods." The only employment decline during the decade was in the lumber, wood products, and furniture group. Manufacturing employment growth varied throughout the region. In the rural counties a large proportion of the gross increase was in manufacture of apparel. In contrast, the contribution of electrical machinery to the gross employment increase was larger in urban counties. The overall percentage increase in manufacturing employment was greatest in Missouri.

Growth Centers in Manufacturing Employment

In 1960, the 11 predominantly urban counties accounted for 39 percent of the manufacturing employment in the region (table 30). Between 1950 and 1960, manufacturing employment increased nearly 38 percent in the urban and 44 percent in the rural counties.

Complementary relationships within existing manufacturing centers affect their suitability for expansion of existing firms or locating new firms. The probability of continued manufacturing growth in a county is greater if that

Table 28.--Share of male and female civilian labor force employed in manufacturing, and distribution of manufacturing employees, by sex, Ozark Region, Appalachia, and United States, 1950 and 1960 1/

Item	1950					1960				
	Share of civilian labor force			Distribution of manufacturing employment		Share of civilian labor force			Distribution of manufacturing employment	
	Male	Female	Total	Male	Female	Male	Female	Total	Male	Female
	Percent									
United States	25.8	22.1	24.8	75.1	24.9	28.7	19.7	25.7	74.9	25.1
Appalachia	n.a.	n.a.	26.4	n.a.	n.a.	n.a.	n.a.	30.1	n.a.	n.a.
Ozark Region	12.2	11.8	12.1	77.7	22.3	18.8	16.5	18.1	71.9	28.1
Rural counties	10.9	11.9	11.1	79.4	20.6	18.1	17.9	18.0	72.0	28.0
Urban counties	14.8	11.7	13.9	75.3	24.7	19.9	14.8	18.1	71.8	28.2
Arkansas	14.7	11.7	14.0	80.0	20.0	21.2	16.5	19.7	73.1	26.9
Rural counties	14.5	12.3	14.1	84.0	16.0	23.2	19.0	22.0	75.9	24.1
Urban counties	14.9	11.2	13.7	74.2	25.8	18.6	14.5	17.1	69.1	30.9
Missouri	11.1	15.8	12.2	70.6	29.4	18.0	20.1	18.7	67.2	32.8
Rural counties	9.5	16.1	10.9	69.7	30.3	16.0	21.2	17.5	64.8	35.2
Urban counties	16.2	15.4	16.0	72.3	27.7	23.2	17.9	21.4	71.7	28.3
Oklahoma	9.3	5.9	8.6	85.6	14.4	15.4	10.1	13.9	79.1	20.9
Rural counties	7.2	3.5	6.5	90.1	9.9	13.3	9.3	12.2	79.3	20.7
Urban counties	13.3	8.8	12.2	81.6	18.4	18.9	11.3	16.6	78.9	21.1

1/ See Appendix B for urban and rural counties in region.

Source: (15, 55, 68).

Table 29.--Manufacturing employment, by industry group, Ozark Region, 1950 and 1960 1/

Industry group	1950 Employment			1960 Employment			Employment change 1950 to 1960		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
	No.	No.	No.	No.	No.	No.	Pct.	Pct.	Pct.
Furniture, lumber, wood.....	26,668	5,969	32,637	24,628	5,702	30,330	-7.6	-4.5	-7.1
Primary metals.....	1,056	2,122	3,178	1,825	1,557	3,382	72.8	-26.6	6.4
Fabricated metals.....	623	1,009	1,632	1,602	2,023	3,625	157.1	100.5	122.1
Machinery, ex. electrical...	940	1,358	2,298	2,552	2,554	5,106	171.5	88.1	122.2
Electrical machinery.....	205	919	1,124	1,127	2,707	3,834	449.8	194.6	241.1
Motor vehicles & equipment..	390	586	976	1,106	971	2,077	183.6	65.7	112.8
Transportation equipment....	227	173	400	2,749	1,508	4,257	1,111.0	771.7	964.3
Other durable goods 2/.....	2,799	5,471	8,270	5,420	7,656	13,076	93.6	39.9	58.1
Food & kindred products.....	7,557	7,741	15,298	12,992	10,895	23,887	71.9	40.7	56.1
Textile mill products.....	797	271	1,068	1,067	364	1,431	33.9	34.3	34.0
Apparel.....	3,878	3,943	7,821	8,760	4,779	13,539	125.9	21.2	73.1
Printing, publishing.....	2,197	3,724	5,921	3,081	4,591	7,672	40.2	23.3	29.6
Chemicals.....	1,018	2,484	3,502	2,506	2,458	4,964	146.2	-1.0	41.7
Other nondurables 3/.....	9,081	3,051	12,132	13,296	5,726	19,022	46.4	87.7	56.8
Total.....	57,436	38,821	96,257	82,711	53,491	136,202	44.0	37.8	41.5

1/ See Appendix B for urban and rural counties in region.
2/ Stone, clay, and glass; instruments; miscellaneous manufacturing.
3/ Tobacco manufacturing, paper and allied products, products of petroleum and coal, rubber products, leather and leather products.

Source: (55, 68).

Table 30.--Manufacturing employment, by sex, Ozark Region, Appalachia and United States, 1950 and 1960 1/

Item	1950 employment			1960 employment			Change 1950 to 1960		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
	Number	Number	Number	Number	Number	Number	Pct.	Pct.	Pct.
United States	11,030,576	3,654,906	14,685,482	13,111,965	4,401,121	17,513,086	18.9	20.4	19.3
Appalachia	n.a.	n.a.	1,380,600	n.a.	n.a.	1,593,200	n.a.	n.a.	15.4
Ozark Region	78,819	21,438	96,257	97,994	38,208	136,202	31.0	78.2	41.5
Rural counties	45,601	11,835	57,436	59,568	23,143	82,711	30.6	95.5	44.0
Urban counties	29,218	9,603	38,821	38,426	15,065	53,491	31.5	56.9	37.8
Arkansas	37,377	9,347	46,724	46,972	17,278	64,250	25.7	84.9	37.5
Rural counties	23,343	4,456	27,799	28,771	9,153	37,924	23.3	105.4	36.4
Urban counties	14,034	4,891	18,925	18,201	8,125	26,326	29.7	66.1	39.1
Missouri	23,347	9,728	33,075	33,190	16,219	49,409	42.2	66.7	49.4
Rural counties	15,219	6,607	21,826	21,162	11,477	32,639	39.0	73.7	49.5
Urban counties	8,128	3,121	11,249	12,028	4,742	16,770	48.0	51.9	49.1
Oklahoma	14,095	2,363	16,458	17,832	4,711	22,543	26.5	99.4	37.0
Rural counties	7,039	772	7,811	9,635	2,513	12,148	36.9	225.5	55.5
Urban counties	7,056	1,591	8,647	8,197	2,198	10,395	16.2	38.2	20.2

1/ See Appendix B for urban and rural counties in region.

Source: (15, 55, 68).

county already has the labor force, facilities, and services to support industry. Events in the Ozark Region in the 1950's seem to verify this proposition. Less than one-tenth of the counties in the region are predominantly urban, but the urban counties accounted for over a third of the 1950-60 increase in manufacturing employment.

Some of the growth in manufacturing employment in rural counties may indicate the development of growth nodes. 23/ Previous studies have shown that dispersion of industry in rural areas is not common. Ruttan states ". . . the dispersion of industrial employment to the less industrialized regions that has occurred in recent years has not been accompanied by any substantial increase in the proportion of total manufacturing employment located in the smaller cities and towns of the Nation". 24/

Female Participation in Manufacturing Growth

Manufacturing in the Ozark Region is drawing more female workers into the labor force than male workers. While the total labor force in the Ozarks declined 5 percent in 1950-60, the female labor force increased 28 percent (table 6). The share of the female labor force in manufacturing, which was much smaller in 1950 than in the United States as a whole, approached the national figure in 1960 (table 28).

Employment of women in manufacturing increased relatively more than employment of men in all State sections of the region (table 30). The increase in female employment in manufacturing was mainly in the apparel and the food and kindred products industries. These industries were responsible for a large part of the total increase in manufacturing employment in the region.

Continued expansion of employment of women in relation to men could create problems. In the Ozarks, it is new for the wife to be a breadwinner, and requires major changes in family living. But higher rates of female employment may help maintain and mask underemployment of men in the region, and thus obstruct employment adjustments needed for a viable industry balance. The short-term gains in family and community income may be offset by a long-run loss of viability of the economy. Yet, any industry contributes to an expanded tax base and to community overhead capital, and helps to develop nodal points of growth.

Manufacturing Problems and Potentials

Manufacturing employment in the Ozarks is dominated by industries having a national history of slow growth of employment, product demand, or earnings

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23/ Census employment figures are based upon the place of residence of workers rather than county of work. Travel across county lines may, therefore, complicate interpretation of data, especially of data for counties near urban centers.

24/ Vernon W. Ruttan. The Potential in Rural Industrialization and Local Economic Development. Paper presented North Central Farm Management Committee Conference March 18-19, 1957, Chicago.

(table 31). 25/ In 1960, 51 percent of the manufacturing employment in the Ozarks was in industries with slow national growth in employment, 78 percent was in industries with slow growth in national demand for the product, and 39 percent was in industries with slow national growth in employee earnings (table 31). The urban counties of the region had a much lower proportion of employment in industries with slow-growth characteristics than the rural counties (table 32).

Table 31.--Manufacturing employment in slow-growth industries, Ozark Region and United States, 1950 and 1960 1/

Item	Slow-growth classification 2/					
	Employment		Demand		Earnings	
	1950	1960	1950	1960	1950	1960
	Percent					
United States	48.9	39.9	66.3	58.1	29.6	24.7
Ozark Region	60.1	51.2	84.5	78.4	49.3	38.9
Rural counties	72.9	61.3	90.9	83.5	58.4	45.4
Urban counties	41.1	35.7	75.1	70.4	35.8	28.9
Arkansas	62.6	51.5	84.4	81.1	57.4	45.9
Rural counties	77.1	62.9	92.7	87.5	67.4	52.8
Urban counties	41.4	35.2	72.2	72.0	42.6	36.0
Missouri	61.0	53.6	84.0	75.4	43.1	31.8
Rural counties	70.8	62.1	90.7	81.9	45.8	35.7
Urban counties	42.0	36.9	71.1	62.7	37.9	24.3
Oklahoma	50.9	45.3	86.0	77.0	38.7	34.3
Rural counties	63.9	54.0	85.4	75.7	61.5	48.2
Urban counties	39.1	35.2	86.6	78.6	18.2	18.1

1/ See Appendix B for urban and rural counties in region.
2/ See Appendix A for industries in each group.

Source: (55, 68).

The region, however, is making substantial progress in improving its manufacturing industry balance despite the continued influx of slow-growth industries. Between 1950 and 1960, increases in some slow-growth manufacturing industries were to some extent offset by losses in others so that the proportion of manufacturing employment concentrated in slow-growing national industries

25/ See Appendix A for definitions and procedures used to isolate the growth characteristics of particular industries.

Table 32.--Increase in manufacturing employment, demand, and earnings among slow-growth industries, Ozark Region and United States, 1950 to 1960 1/

Item	Slow-growth classification 2/		
	Employment	Demand	Earnings
	Percent		
United States	7.1	26.6	11.4
Ozark Region	33.8	65.5	18.5
Rural counties	39.7	69.2	22.1
Urban counties	25.7	60.1	11.6
Arkansas	25.4	73.6	19.0
Rural counties	30.8	75.5	20.5
Urban counties	18.7	68.8	18.3
Missouri	42.6	60.8	14.2
Rural counties	48.1	66.5	20.6
Urban counties	36.2	52.9	4.9
Oklahoma	38.0	58.0	27.6
Rural counties	40.8	61.2	29.7
Urban counties	35.3	53.4	23.4

1/ See Appendix B for urban and rural counties in region.
2/ See Appendix A for industries in each group.

Source: (55, 68).

declined. Thus, the region is gradually moving toward a manufacturing industry balance similar to that of the United States. So long as the balance remains adverse, however, the manufacturing economy of the region must look to continued shifting of slow-growth industry from other regions into the Ozarks to have a growth rate similar to that of the United States. This, in turn, adversely affects the industry balance, but it can be justified as a temporary measure. Even a slow-growth industry will increase the tax base, and will lead to development of public services attractive to more desirable industry, and of needed complementary services. The short-run policies which encourage these shifts need not overshadow the desirable goal of greater sustained growth. Attracting and maintaining rapidly growing industries should be the foremost policy of the region.

PUBLIC AND PRIVATE SERVICES

A major problem of a region with a declining population is the consolidation and support of the services of the economy, especially the services relating to communication, transportation, and education.

The difficulty of supporting needed public services in the Ozarks stems from (a) a continued absolute loss of population contributing to a higher per capita service cost and a lower tax base, (b) a relatively large dependent population, and (c) low incomes.

Local Support of Public Services

One method of measuring the local support for public services is by means of an "effort index" compiled by expressing revenues from local sources as a percentage of personal income. General revenues from local sources averaged almost 5 percent of personal income in the region in 1963 (table 33). The proportion was higher in the urban than the rural counties. Interstate differences were also apparent--Arkansas counties averaged lowest, Oklahoma counties highest.

Table 33.--Selected measures of support of public services, Ozark Region 1/

Item	Expenditure per pupil 1959-1960 2/	Earnings per teacher 1962 3/	Local revenue as share of general revenues, 1962	Effort index 4/
	Dollars	Dollars	Percent	Percent
Ozark Region	253.20	399	58.83	4.95
Rural counties	251.80	394	52.82	4.89
Urban counties	253.90	408	68.27	5.03
Arkansas	201.20	358	62.18	4.59
Rural counties	192.70	345	52.77	4.34
Urban counties	213.80	376	71.10	4.79
Missouri	284.40	407	62.98	5.11
Rural counties	281.60	395	58.47	4.97
Urban counties	292.90	443	73.31	5.39
Oklahoma	291.80	449	48.63	5.46
Rural counties	296.70	434	44.55	5.67
Urban counties	282.20	456	56.15	5.17

1/ See Appendix B for urban and rural counties in region.
2/ Based on average daily attendance.
3/ Full-time Primary and Secondary teachers, October 1962.
4/ General revenue from local sources as percent of total personal income.

Source: (3, 46, 73). Also, Total General Expenditure by County of School Districts for 1950-60 School Year and Average General Attendance by Counties, special communication from Mo. State Dept. Ed.

The proportion of general revenue from local sources indicates the extent to which the State Governments support local functions. The proportion averaged 59 percent in the Ozark counties, and was consistently higher in the urban than in the rural counties. Where the effort index was high the proportion of general revenue from local sources was also high except in Oklahoma, where the effort index was relatively high but the local share of general revenue was quite low.

The indebtedness of local governments indicates willingness to support public services beyond current tax revenues. But in an area with a population decline and a decline in taxable assets, indebtedness may represent a willingness to support public services at the risk of increasing taxes. The long-term per capita indebtedness of local governments in the Ozarks averaged about one-third that of all local governments within the United States--$99 compared with $309 (table 34). The average in the urban counties of the region was almost twice as high as in the rural counties.

Table 34.--Per capita long-term indebtedness of local governments, Ozark Region, 1962 1/

Item	Long-term indebtedness 1962	Population 1960	Indebtedness per capita
	1,000 dollars	Number	Dollars
United States	55,455,000	179,325,671	309.24
Ozark Region	223,419	2,250,805	99.26
Rural counties	111,619	1,443,946	77.30
Urban counties	111,800	806,859	138.56
Arkansas	111,688	931,776	119.86
Rural counties	44,725	519,617	86.07
Urban counties	66,963	412,159	162.46
Missouri	71,201	786,330	90.55
Rural counties	42,389	581,181	72.93
Urban counties	28,812	205,139	140.45
Oklahoma	40,530	532,699	76.08
Rural counties	24,505	343,138	71.41
Urban counties	16,025	189,561	84.53

1/ See Appendix B for urban and rural counties in region.

Source: (73).

Expenditures by local governments within the region indicate a high priority for education. Close to 60 percent of local government expenditure other than capital outlay went for education in 1962 (73). The average was under 50 percent for all local governments in the United States.

Regardless of the priority placed upon education, the region's expenditure per pupil in daily attendance is too low to maintain an adequate educational system. The Ozark expenditure per pupil in average daily attendance in 1962 was $253. This is low, especially in relation to the size of schools and density of population (table 33). The expenditure per pupil in smaller schools must be considerably above that in larger schools to insure the same quality of instruction. Expenditures averaged $201 in Arkansas, $284 in Missouri, and $292 in Oklahoma. Small differences existed between rural and urban counties.

Teacher earnings reflect these low expenditures. Average monthly earnings were about $400 for October 1962. Teacher salaries in Oklahoma averaged highest, those in Arkansas lowest. Salary differences between rural and urban counties were small.

The lack of adequate support for education in the region is also reflected in the amount per capita spent by local governments in the region compared with local governments in the rest of the United States. In 1962, the average (other than capital outlay) was $65 in the Ozarks compared with $83 in the country as a whole (table 35). Arkansas' expenditure of $53 was low compared with averages of $73 for Missouri and $74 for Oklahoma.

Highways receive second priority for expenditures by local governments, and per capita expenditure is about the same as in the country as a whole. However, roads and highways in the region are very expensive to build and maintain, because of the topography and soil composition. The interstate highway program can partially substitute for State and local programs. Three major interstate routes, predominantly east-west, course through parts of the region. Interstate 44 (U.S. 66) had a 1962 average 24-hour count of 5,620 vehicles between St. Louis and Springfield, Mo. (fig. 7). Interstate 40 (U.S. 64) will, upon completion, bisect the Arkansas and Oklahoma portion of the region on a line from Little Rock to Oklahoma City. Traffic counts in 1962 on the old road which Interstate 40 will replace averaged 2,500 in Arkansas and 3,300 between Fort Smith and Muskogee. Interstate 30 (U.S. 67) from Little Rock to Texarkana skirts the southern border of the region.

The major north-south routes through the region are U.S. 69 in eastern Oklahoma, U.S. 71 through western Arkansas and Missouri, and U.S. 65 from Little Rock north through Springfield. Highway 67 from Little Rock to St. Louis roughly defines the eastern boundary of the region.

East-west traffic through the region will be well served by the interstate system under construction. Present north-south highways giving access to the major recreation areas are heavily traveled in the recreation season, but their inadequacy restricts movement of vacationists from the major population centers to the north. Since a major portion of the vacationists come from north of the recreation areas, lack of adequate direct access limits utilization of the full potential of the areas.

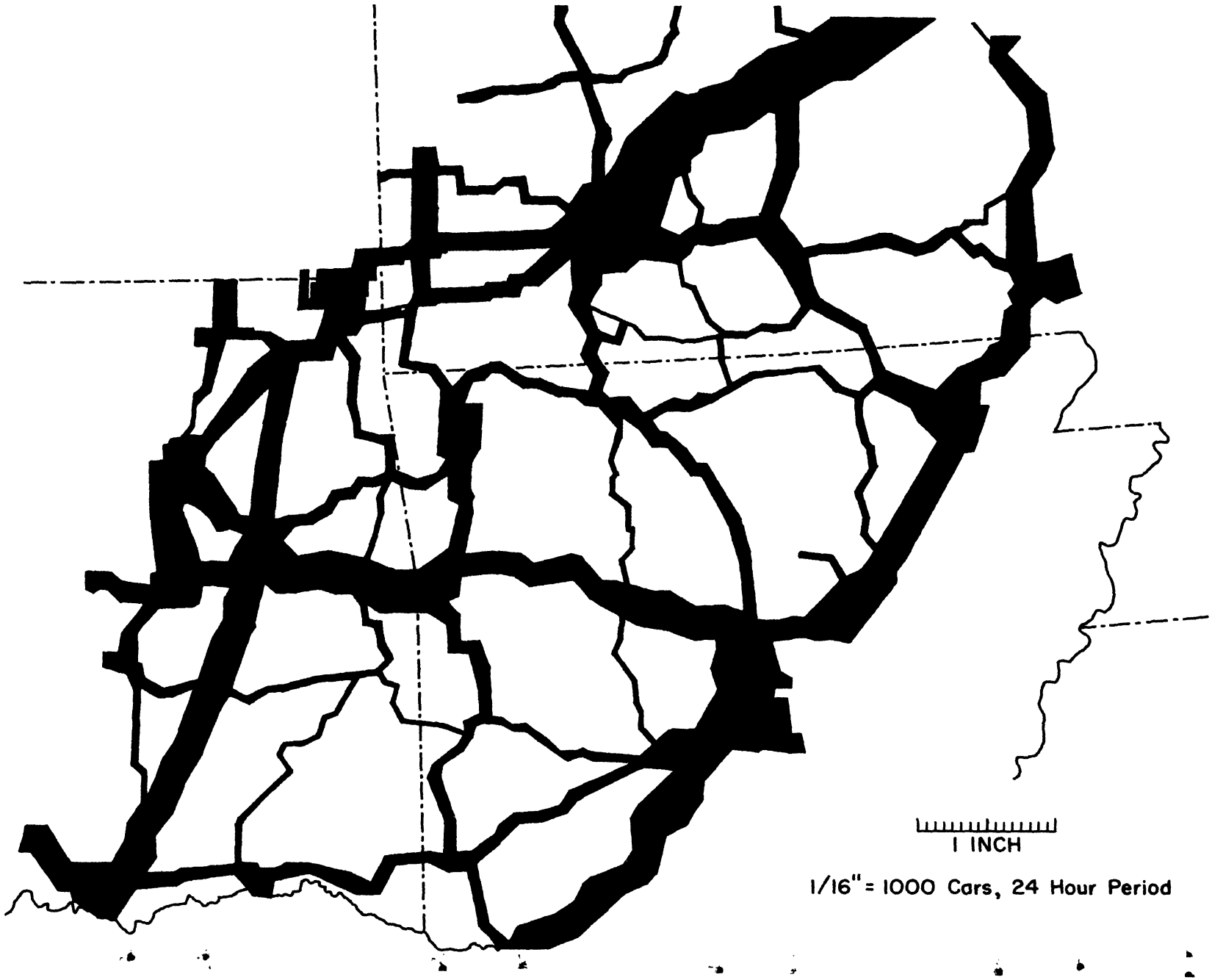
Table 35.--Per capita local government expenditure other than allocated capital outlay, Ozark Region by State area and predominant county classification, 1962 1/

Type of expenditure	U. S.	Ozarks			Arkansas			Missouri			Oklahoma		
		Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
	Dollars												
Direct general expenditure, other than capital outlay 2/	175.50	108.49	101.38	121.23	101.21	87.23	118.84	108.39	101.08	129.08	121.38	123.30	117.93
Education	83.22	64.73	66.10	62.29	52.56	51.47	53.93	72.90	72.28	74.65	73.99	77.80	67.09
Highways	11.97	11.08	11.63	10.09	10.51	11.13	9.74	7.50	7.22	8.31	17.34	19.86	12.78
Public welfare	14.35	0.45	0.35	0.61	0.46	0.34	0.61	0.49	0.35	0.91	0.35	0.37	0.30
Health & hospitals	11.00	5.85	5.53	6.41	5.55	6.41	4.48	4.43	3.91	5.90	8.45	6.95	11.18
Police protection	10.33	4.32	3.19	6.36	4.61	3.00	6.64	4.07	3.09	6.87	4.19	3.64	5.18
Fire protection	6.32	2.50	1.10	5.00	3.08	1.09	5.58	2.14	1.03	5.28	2.01	1.23	3.41
Sewerage	2.15	0.90	0.51	1.60	0.90	0.46	1.46	0.93	0.43	2.34	0.85	0.72	1.09
Sanitation other than sewerage	3.82	0.99	0.35	2.15	1.23	0.37	2.32	0.66	0.22	1.93	1.07	0.54	2.02
Parks & recreation	3.44	1.30	0.26	3.16	1.80	0.16	3.86	1.23	0.40	3.59	0.53	0.18	1.17
Natural resources	1.19	0.51	0.67	0.22	0.38	0.53	0.16	0.37	0.48	0.06	0.93	1.15	0.54
Housing and urban renewal	2.04	2.22	0.03	6.13	5.25	0.10	11.73	0.13	0	0.53	0	0	0
Correction	1.33	0.27	0.11	0.54	0.36	0.13	0.64	0.32	0.16	0.77	0.03	0.01	0.07
Libraries	1.77	0.97	0.53	1.75	1.17	0.40	2.15	1.16	0.90	1.90	0.34	0.12	0.73
Financial administration	3.08	1.83	1.67	2.12	1.82	1.64	2.05	1.60	1.41	2.13	2.19	2.15	2.26
General control	5.68	3.55	3.47	3.68	3.31	3.26	3.38	3.62	3.37	4.34	3.85	3.97	3.63
General public buildings	1.52	0.73	0.58	1.00	0.79	0.61	1.03	0.69	0.54	1.11	0.70	0.62	0.83
Interest on general debt	7.67	2.77	2.20	3.80	3.33	2.40	4.49	2.73	2.35	3.83	1.87	1.66	2.26
Other and unallocable	4.57	3.44	2.99	4.24	4.01	3.60	4.52	3.32	2.88	4.55	2.63	2.26	3.30

1/ See Appendix B for urban and rural counties in region.
2/ Includes some minor capital outlays that were not allocated to functions.

Source: (73).

FIGURE 7. MAJOR HIGHWAY TRAFFIC, OZARK REGION, 1962



The greatest benefit to be derived from improved highways within certain parts of the Ozark Region is from access provided to the major family recreation developments. The highway systems are presently constituted with respect to the major population centers, where recreation enterprises have developed and flourished. But improved routes into many of the more remote recreation areas would create a greater potential for economic development through family vacation type recreation.

Employment Complementary to Industry

The probability of future growth in industries that ship products to other regions is greatest at points which already have some industrial concentration. Recreation-related growth has a greater probability of occurring at points exhibiting past growth because of convenience and savings to consumers when these services are offered close to each other. Manufacturing requires a set of available community facilities and business services. Where these are well developed, the services are cheaper when used by several firms rather than a single firm. This section identifies specific points where economic growth has a higher probability of occurring.

The industry location process is quite complicated, and is different for each industry. Availability of complementary business services is only one of many factors in the location matrix of industry, but availability of these services in a place increases the probability for industrial growth there.

The urban counties have a high concentration of employment in these services, as do certain of the rural counties (table 36). In 1960, Phelps County, Mo., which is a rural county, ranked second only to the urban county of Pulaski, Ark., in this respect. Phelps County is the site of the Missouri School of Mines, and has a large number of professional personnel. The other rural counties with 30 percent or more of their labor force employed in complementary services in 1960 were Cherokee and Latimer Counties, Okla., each the site of a junior college; Craig County, Okla., in which the city of Vinita is a service point between Tulsa and Springfield on Interstate 44; Logan County, Ark., which is within commuting distance of Fort Smith, a thriving industrial city; and Pulaski County, Mo., the location of Fort Leonard Wood.

Government employment in the region is lower than in the United States as a whole. Local government employees averaged 208 per 10,000 population in 1962 within the region, compared with 250 in the United States as a whole (table 37). The number of Federal employees per 10,000 population was also lower than in the United States, but varied considerably within the region. The number in the urban counties of Arkansas and Oklahoma exceeded the U. S. average, but the number was much lower in most of the rural counties, including all of the Missouri counties.

Problems and Potentials in Public and Private Services

Adequate public services, especially those relating to education, cannot be supported with the revenues generated by local governments within the region. Yet, expenditures for education and highways both have to be above the

Table 36.--Counties ranked by share of civilian labor force in manufacturing-related trades and services, Ozark Region, 1960 1/

Rank	County and State	Share	Rank	County and State	Share
		Percent			Percent
1	Pulaski, Ark. (urban)	41	46	Oregon, Mo	22
2	Phelps, Mo	40	47	Pope, Ark	22
3	Muskogee, Okla. (urban)	36	48	Crawford, Ark	22
4	Greene, Mo. (urban)	36	49	Johnson, Ark	22
5	Latimer, Okla	34	50	Baxter, Ark	22
6	Craig, Okla	33	51	Fulton, Ark	22
7	Pittsburg, Okla. (urban)	33	52	Adair, Okla	22
8	Washington, Ark. (urban)	32	53	Polk, Mo	22
9	Pulaski, Mo	30	54	Benton, Ark	22
10	Sebastian, Ark. (urban)	30	55	Ripley, Mo	22
11	Jasper, Mo. (urban)	30	56	Little River, Ark	22
12	Cherokee, Okla	30	57	Howell, Mo	21
13	Logan, Ark	30	58	Perry, Ark	21
14	Butler, Mo	29	59	Camden, Mo	21
15	St. Francois, Mo	29	60	Dent, Mo	21
16	Pontotoc, Okla. (urban)	29	61	Coal, Okla	21
17	Bryan, Mo	28	62	Sequoyah, Okla	21
18	Faulkner, Ark	28	63	Wagoner, Okla	21
19	Taney, Mo	27	64	Haskell, Okla	21
20	Johnston, Okla	27	65	Howard, Ark	21
21	Clark, Ark	27	66	Christian, Mo	21
22	Garland, Ark. (urban)	27	67	McCurtain, Okla	20
23	Hughes, Okla	27	68	Barton, Mo	20
24	Okfuskee, Okla	26	69	Independence, Ark	20
25	Le Flore, Okla	26	70	Marion, Ark	20
26	Okmulgee, Okla. (urban)	26	71	Wayne, Mo	20
27	Ottawa, Okla. (urban)	26	72	Nowata, Okla	20
28	Saline, Ark	26	73	Marshall, Okla	20
29	Mayes, Okla	25	74	McDonald, Mo	20
30	Boone, Ark	25	75	Cedar, Mo	20
31	Iron, Mo	25	76	Webster, Mo	20
32	Rogers, Okla	25	77	Washington, Mo	20
33	Lawrence, Mo	25	78	Delaware, Okla	20
34	Choctaw, Okla	25	79	Lawrence, Ark	20
35	Sevier, Ark	24	80	Hot Spring, Ark	20
36	McIntosh, Okla	24	81	Conway, Ark	20
37	Miller, Mo	24	82	Sharp, Ark	20
38	Reynolds, Mo	24	83	Carter, Mo	19
39	White, Ark	23	84	Stone, Ark	19
40	Laclede, Mo	23	85	Randolph, Ark	19
41	Love, Mo	23	86	Dallas, Mo	19
42	Atoka, Okla	23	87	Morgan, Mo	19
43	Pushmataha, Okla	23	88	Wright, Mo	19
44	Newton, Mo	23	89	Hempstead, Ark	19
45	Barry, Mo	22	90	Franklin, Ark	18

-- continued

Table 36.--Counties ranked by share of civilian labor force in manufacturing-related trades and services, Ozark Region, 1960 1/--Continued

Rank	County and State	Share	Rank	County and State	Share
91	Polk, Ark.	18	103	Madison, Mo.	17
92	St. Clair, Mo.	18	104	Montgomery, Ark.	17
93	Yell, Ark.	18	105	Dade, Mo.	16
94	Benton, Mo.	18	106	Crawford, Mo.	16
95	Newton, Ark.	17	107	Scott, Ark.	15
96	Texas, Mo.	17	108	Stone, Mo.	15
97	Cleburne, Ark.	17	109	Carroll, Ark.	15
98	Pike, Ark.	17	110	Shannon, Mo.	14
99	Maries, Mo.	17	111	Searcy, Ark.	14
100	Bollinger, Mo.	17	112	Ozark, Mo.	13
101	Van Buren, Ark.	17	113	Hickory, Mo.	13
102	Izard, Ark.	17	114	Douglas, Mo.	13
			115	Madison, Ark.	12

1/ Manufacturing-related trades and services are those classified by the census as public utilities and transportation; wholesale trade; finance, insurance, and real estate; professional and related services; and government.

Source: (68).

average for the United States if services are to be made comparable to those of the rest of the Nation.

Present public and private services are inadequate to attract additional industry to the region, with the exception of the urban counties and a few of the rural counties. The urban counties constitute the greatest potential for further development.

More and improved highways, airports, and communications are necessary to develop most other parts of the region. The full potential of the region's recreational assets and the development of additional industry will depend upon ready access to its resources.

RESEARCH NEEDS

At present there are many developmental relationships which are not thoroughly understood. Such understanding is essential to organization of a comprehensive program to foster maximum utilization of the region's resources. Research in four general areas is essential to assure sound regional action programs:

1. Technical, scientific, and engineering research to improve the efficiency of resource utilization in the region.

Table 37.--Local government and Federal civilian employees per 10,000 population, Ozark Region, 1962 1/

Item	Local government employees (full-time equivalent)		Federal civilian employees (full-time equivalent)	
	Total	Per 10,000 population 2/	Total	Per 10,000 population 2/
	Number	Number	Number	Number
United States	4,480,158	250	2,212,848	123.4
Ozark Region	46,920	208	19,687	87.4
Rural counties	28,864	200	9,455	65.4
Urban counties	18,056	224	10,232	126.8
Arkansas	18,536	199	9,126	97.9
Rural counties	9,820	189	2,785	53.6
Urban counties	8,716	211	6,341	153.8
Missouri	15,896	202	6,013	76.5
Rural counties	10,920	188	4,804	82.7
Urban counties	4,976	243	1,209	58.9
Oklahoma	12,488	234	4,548	85.4
Rural counties	8,124	237	1,866	54.4
Urban counties	4,364	230	2,682	141.5

1/ See Appendix B for urban and rural counties in region.
2/ Per 10,000 population in 1960.

Source: (32, 73).

2. Sociological, psychological, and economic research to learn more about the nature of people in the region and their needs, to facilitate adjustments.

3. Research to determine the needs for community facilities and services and to promote the provision of such facilities and services.

4. Research on the structural relationships within the region and its subareas required to utilize available resources for development of the region.

Financial support for research in the region needs to be increased and placed on a continuing basis, and, in some cases, current research programs need to be reoriented to meet the needs of economic development in the region.

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APPENDIX A

Industry Performance

Industry balance refers to the proportion of industry employment of the region in slow-growth or fast-growth industries classified by major industry group (1957 two-digit SIC code). Slow-growth or fast-growth is defined three ways with respect to (1) demand for product, (2) employment, or (3) earnings.

The following general formula for each major industry group was used in the basic calculations: 1/

$$\text{Index} = \left[\frac{(X_{mi}/X_m)}{(X_{ni}/X_n)} = 100\right] - 100$$

where X = National income, employment, or average full-time earnings
i = Industry classification
m = 1960
n = 1950

The indexes classify each major industry group relative to growth of all industry in the United States (table 38). A positive demand or employment index means the industry group has increased its share of national income or national employment. A positive earnings index implies earnings in that industry group have increased more rapidly than the average. Those industry groups with positive indexes are fast-growth, and those with negative indexes are slow-growth. Regions specializing in fast-growth industries will have greater growth than the United States as a whole.

Industry classifications of the census and national income series are not comparable. National income and earnings data are from establishment records, while those of the census are from individuals. The Census of Population classes government employees by industry (including public administration) while the national income and earnings series classify government employees together regardless of industry association.

1/ Lee R. Martin, Long-run Developments in the United States in the Demand for Goods and Services and for Labor, unpublished manuscript on file Dept. Agr. Econ., Univ. Ark. Fayetteville.

Table 38.--Change in demand for product, labor, and earnings by economic activity, 1950 to 1960, and annual earnings 1960, United States

Industry group 1/	Change 1950 to 1960			Annual earnings index 1960
	Demand	Labor	Earnings	
	Percent			
Agriculture, forestry and fisheries	-41.9	-46.2	-17.7	36.9
Mining	-36.2	-38.9	5.4	120.8
Contract construction	10.0	-4.0	5.0	116.6
Manufacturing total	-5.6	3.8	3.4	113.5
Furniture, lumber, wood	-29.9	-22.4	-3.4	85.0
Primary metals	-14.9	-10.0	8.7	134.7
Fabricated metals	0.6	32.7	5.4	123.7
Machinery, ex. electrical	0.8	8.8	2.5	128.0
Electrical machinery	30.2	50.3	8.1	121.1
Motor vehicles and equip	-26.6	-14.5	4.5	139.3
Transportation equipment	88.0	74.8	13.3	140.7
Other durable goods	-0.5	10.6	3.8	110.5
Stone, clay and glass	-5.0	-	5.3	113.4
Instruments	33.8	-	7.3	126.0
Miscellaneous manufacturing	-16.2	-	-2.7	96.6
Food and kindred products	-11.4	7.0	2.1	104.1
Textile mill products	-41.6	-32.4	-13.7	79.2
Apparel	-17.2	-5.4	-15.2	70.4
Printing, publishing	4.6	15.1	-5.7	119.2
Chemicals	5.3	18.0	7.2	134.3
Other non-durables	-5.7	-7.8	0.8	110.3
Tobacco manufacturing	13.6	-	9.2	81.9
Paper and allied products	-1.8	-	1.9	117.8
Products of petroleum and coal	-16.1	-	2.9	147.7
Rubber products	18.9	-	0.4	118.2
Leather and leather products	-19.9	-	-9.9	76.2
Transportation, communication and public utilities	-1.7	-12.8	4.1	123.7
Transportation	-21.8	-19.3	2.5	125.9
Communication and public utilities	35.7	0.0	8.7	119.9
Wholesale trade	0.9	-2.0	0.3	127.9
Retail trade	-14.7	-2.4	-9.9	81.8
Finance, insurance and real estate	19.3	22.2	-3.9	102.8
Professional and related services	35.9	36.6	-1.4	79.3
Commercial and trade schools and empl. agencies	-11.4	-	-17.7	93.3
Medical and other health services	37.3	48.1	-5.9	64.7
Legal services	17.1	-	13.6	89.7
Engineering and other prof. services, NEC	85.8	22.4	7.2	146.3
Educational services, NEC 2/	35.7	42.1	0.4	82.6
Non-profit membership organizations, NEC	29.5	26.5	-2.9	83.2
Government and government enterprises 2/	29.7	10.8	-0.7	99.5
Other services	17.0	-1.3	5.4	74.0
Hotels and other lodging places 3/	-13.2	-	-11.6	63.2
Personal services	-7.2	-9.4	-2.0	71.6
Private households	30.2	4.2	-0.6	49.6
Business services, NEC	71.9	84.9	-1.8	112.9
Miscellaneous repair services and hand trades	-3.0	-22.2	-5.8	107.8
Motion pictures 4/	39.8	-	0.6	97.5
Amusements and recreation, ex. motion pictures	22.4	-11.3	14.0	98.4
Other industry (rest of the world)	4.5	169.1	-6.8	111.5

1/ Major differences in groupings are footnoted separately. Lack of data or noncomparability of data necessitate blanks within some subgroups in the labor index derived from census data on employment.

2/ National income series from which demand and earnings indexes were calculated report any type of government employment as "government and government enterprises" while census data on employment are reported by industry whether public or private. The education data in the labor index includes public and private education together.

3/ Reported as a part of personal services in the labor index.

4/ Reported as a part of amusement in the labor index.

Source: (42, p. 177; 43, pp. 13 and 30; 44, p. 213; 68).

Table 39.--Slow-growth manufacturing industries, Ozark Region, 1950 to 1960 1/

Industry group	Demand	Employment	Earnings
Apparel	X	X	X
Food and kindred products	X		
Furniture, lumber and wood products	X	X	X
Motor vehicles and equipment	X	X	
Other durable goods	X		
Other non-durable goods	X	X	
Primary metals	X	X	
Printing and publishing			X
Textile mill products	X	X	X

1/ Delineated using the classification indexes developed in this section above.

The annual earnings index, 1960 (table 38) is the 1960 average industry earnings per full-time employee as a percentage of the average earnings per full-time employee for all industry in the United States. The index compares the earnings status for 1960 of the various industries.

Recreation-Related Employment Index (RRE Index)

The trades and services employment most closely associated with recreation were retail trade, repair services, other personal services, and entertainment and recreation as defined in the Census of Population, 1960 (67).

The general formula for the recreation-related employment index for each county is as follows:

$$\text{RRE Index} = \frac{(E_{mi}/L_m)/(E_{ni}/L_n)}{(E'_{mi}/L'_m)/(E'_{ni}/L'_n)} = \frac{\text{1950-60 percentage change in ratio of recreation employees to total labor force, Ozark counties}}{\text{1950-60 percentage change in ratio of recreation employees to total labor force, U.S.}}$$

where E' = U. S. employment
E = County employment
L' = U. S. civilian labor force
L = County civilian labor force
m = 1960
n = 1950
i = Recreation-related trades and services

An RRE index above 100 indicates that share of the labor force in recreation-related trades and services has increased more rapidly in the area than in the United States. An index below 100 indicates it has not increased as rapidly as in the United States.

Recreation-Related Sales Index (RRS Index)

The trade and service sales and receipts most closely associated with recreation are from the Census of Business 1954 and 1963 (58, 72). These include retail trade, other personal services, repair services, and entertainment and recreation services.

The recreation-related sales index was calculated using the following general formula:

$$\text{RRS Index} = \frac{S_{mi}}{[(S'_{mi}/S'_{ni})\ (S_{ni})]} = \frac{\text{Actual 1963 sales, industry i}}{\text{Expected 1963 sales, industry i}}$$

where S' = U. S. sales and receipts
S = County sales and receipts
m = 1963
n = 1954
i = Recreation-related sales and receipts

An RRS index above 100 means sales in the area have increased more rapidly than the United States. An index below 100 means sales have not increased as rapidly as U.S. sales, or have decreased more rapidly. Population data were not available by county in 1954 and 1963, so the sales could not be expressed in relation to population.

APPENDIX B

Table 40.--Counties included in the delineation of the Ozark Region in this report, by State area

Arkansas	Arkansas (continued)	Missouri (continued)	Oklahoma
Baxter	Randolph	Hickory	Adair
Benton	Saline	Howell	Atoka
Boone	Scott	Iron	Bryan
Carroll	Searcy	Jasper*	Cherokee
Clark	Sebastian*	Laclede	Choctaw
Cleburne	Sevier	Lawrence	Coal
Conway	Sharp	Madison	Craig
Crawford	Stone	Maries	Delaware
Faulkner	Van Buren	McDonald	Haskell
Franklin	Washington*	Miller	Hughes
Fulton	White	Morgan	Johnston
Garland*	Yell	Newton	Latimer
Hempstead		Oregon	Le Flore
Hot Spring	Missouri	Ozark	Love
Howard	Barry	Phelps	McCurtain
Independence	Barton	Polk	McIntosh
Izard	Benton	Pulaski	Marshall
Johnson	Bollinger	Reynolds	Mayes
Lawrence	Butler	Ripley	Muskogee*
Little River	Camden	Shannon	Nowata
Logan	Carter	St. Clair	Okfuskee
Madison	Cedar	St. Francois	Okmulgee*
Marion	Christian	Stone	Ottawa*
Montgomery	Crawford	Taney	Pittsburg*
Newton	Dade	Texas	Pontotoc*
Perry	Dallas	Washington	Pushmataha
Pike	Dent	Wayne	Rogers
Polk	Douglas	Webster	Sequoyah
Pope	Greene*	Wright	Wagoner
Pulaski*			

* Predominantly urban counties.

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