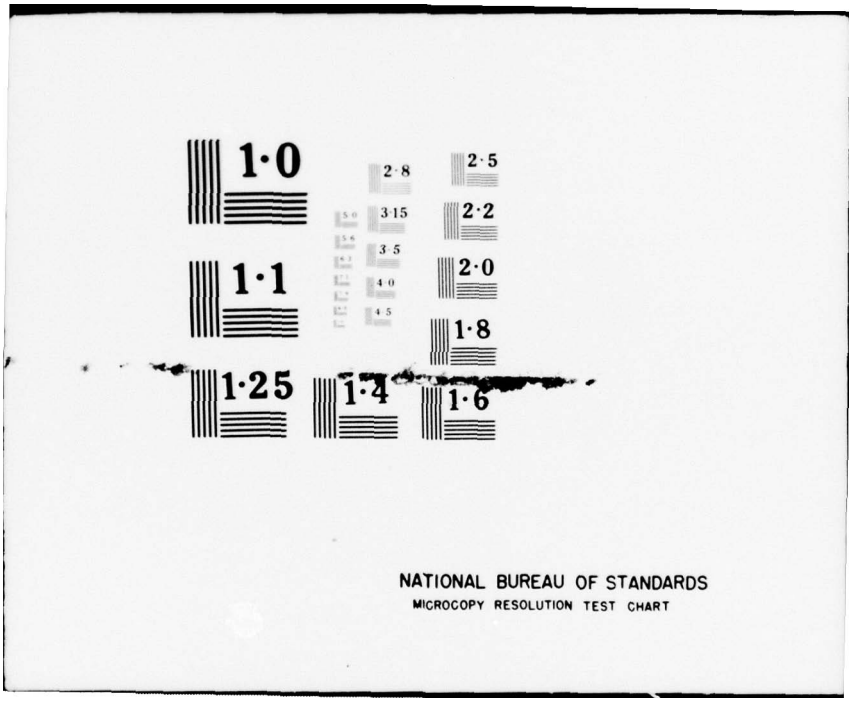
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# Lower Mississippi Region Comprehensive Study

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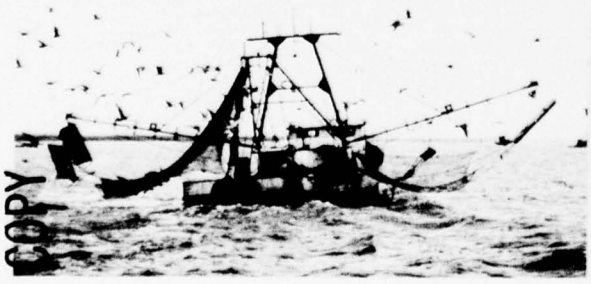




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| A | History of Study | K | M and I Water Supply |
| B | Economics | L | Water Quality and Pollution |
| C | Regional Climatology Hydrology & Geology | M | Health Aspects |
| D | Inventory of Facilities | N | Recreation |
| E | Flood Problems | O | Coastal and Estuarine Resources |
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| G | Related Mineral Resources | Q | Fish and Wildlife |
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| I | Agricultural Land Drainage | S | Sediment and Erosion |
| J | Navigation | T | Plan Formulation |
| | | U | The Environment |

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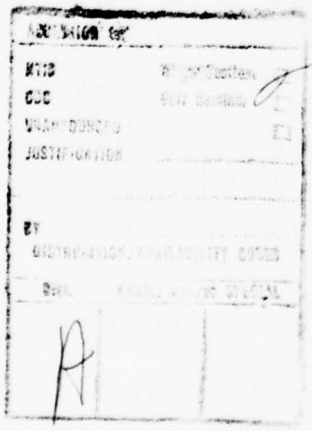


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# INTRODUCTION

## PURPOSE OF APPENDIX

The work reported herein was conducted to establish economic forecasts from which future requirements for water and water-related land resources can be predicted in each of ten river basin areas, termed Water Resource Planning Areas (WRPA's). Such requirements, based on the economic outlook for the ten areas, provide the basis for the formulation of framework plans for the management, use, and development of the water resources of the entire Lower Mississippi Region, ~~(figure 1)~~.

Economic projections have been made for two programs, designated A, National Income, and B, Regional Development. Program A is based on forecasts made by the Water Resources Council for all sections of the United States, and Program B presents the future economy of the Lower Mississippi Region projected under an assumption that the region will grow economically at the same rate that the Water Resources Council projects for the Nation.

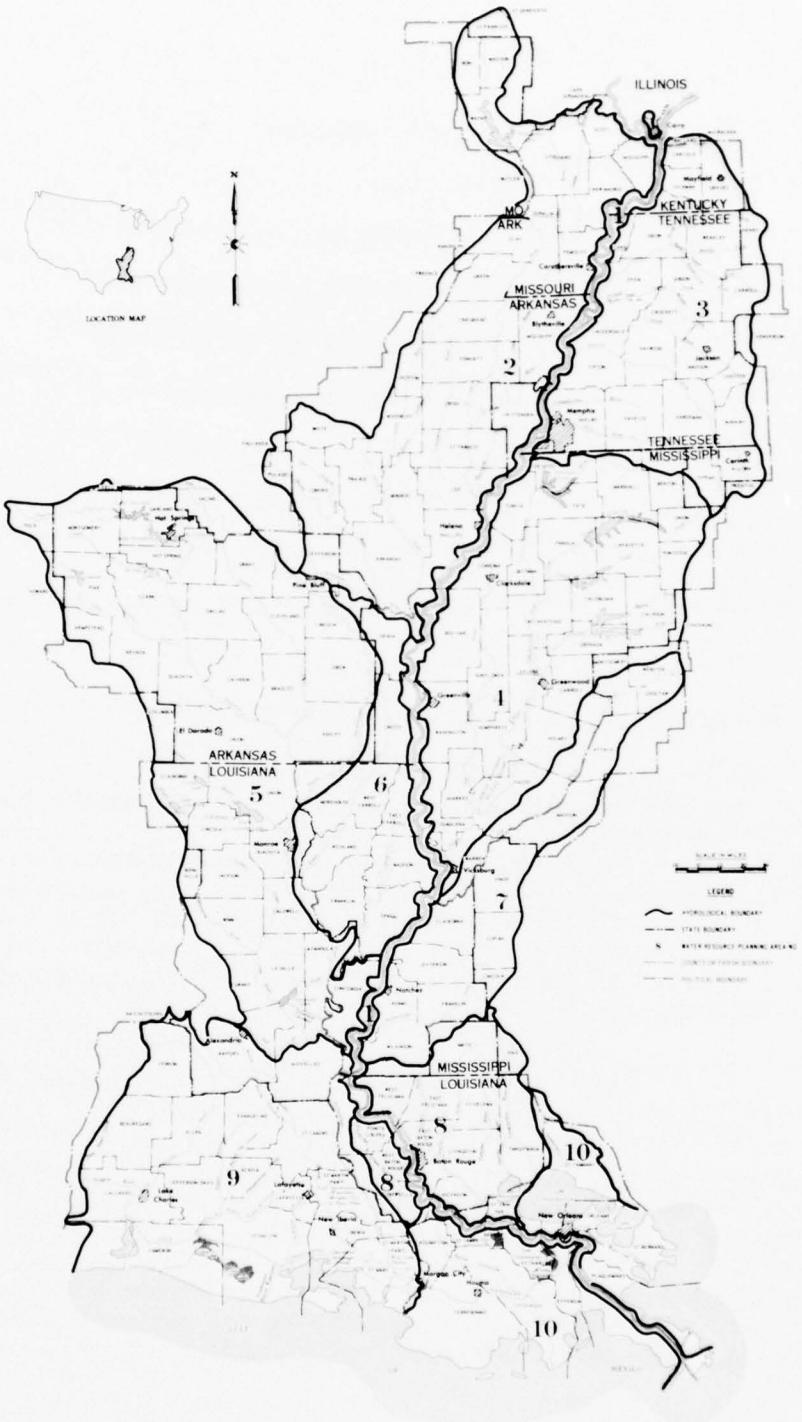
## RELATION TO OTHER APPENDIXES OF THE COMPREHENSIVE STUDY

Twenty-one separate appendixes, of which this is one, present results of the Lower Mississippi Region Comprehensive Study. Economic forecasts for the years 1980, 2000, and 2020, dealing specifically with population, income, employment, industrial production, and related activities, are presented herein for use in determining future water and water-related land resource needs. Such needs, as presented in other appendixes, provide guidelines for developing long-range comprehensive plans for managing the region's water-related resources.

## STUDY ORGANIZATION

National economic forecasts have been projected for the Water Resources Council by the Bureau of Economic Analysis (BEA), U. S. Department of Commerce (formerly Office of Business Economics (OBE)), and the Economic Research Service (ERS) in the U. S. Department of Agriculture. Popularly termed OBERS to signify a joint effort by OBE and ERS, the forecasts provide estimates of what to expect nationally in terms of population, employment, earnings, income, and production of goods and services.

The work reported in this appendix represents the results of a




LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

**LOWER MISSISSIPPI REGION**

FIGURE 1

cooperative effort made by personnel of State agencies and regional Federal offices in preparing economic forecasts for the Lower Mississippi Region and each WRPA. The OBERS baseline projections were used as guides for both Programs A and B.

## CONCEPTS AND ASSUMPTIONS

Economic forecasts are based on an extension of past trends which appear logical for the future. Long-run or secular trends with effects of cyclical fluctuations eliminated were calculated for various segments of the national economy, and projections were made based on the following assumptions:

(1) Population increases will reflect an anticipated decline of fertility rates from those of the 1962-1965 period. The Bureau of Census projections for the "Series C" level, reflecting an average growth rate of 1.3 percent per year, were used.

(2) Nationally, reasonably full employment, represented by a 4 percent unemployment rate, will prevail throughout the 50-year period; as in the past, unemployment will be disproportionately distributed regionally, but the disproportion will be diminishing.

(3) Continued technological progress and capital accumulation will support an increase in production per man-hour of 3 percent per year.

(4) Gross National Product (GNP) will expand at around 4 percent annually.

(5) Hours worked per year per person will decline somewhat. By the year 2020, this will average 1,750 hours versus 2,000 today.

(6) Growth in output can be achieved without serious deleterious effects on the environment.

(7) Trends toward area self-sufficiency in local-service or residentiary industries will continue.

(8) Regional earnings per worker and income per capita will converge toward the national average.

## DELINEATION OF STUDY AREAS

### Economic Areas

As part of a program for the preparation of national and regional projections of economic activity, the country was divided into areas which have special significance for economic analysis.

These economic areas are based on central place theory which emphasizes that cities are the hubs around and within which integrated economic activity for each area is concentrated. There are strong economic relationships between cities and hinterlands as well as between individual households and business establishments. Moreover, each economic area combines its labor market and its labor supply—the place of work and place of residence of its labor force. There is, therefore, a minimum of commuting between home and work across economic area boundaries.

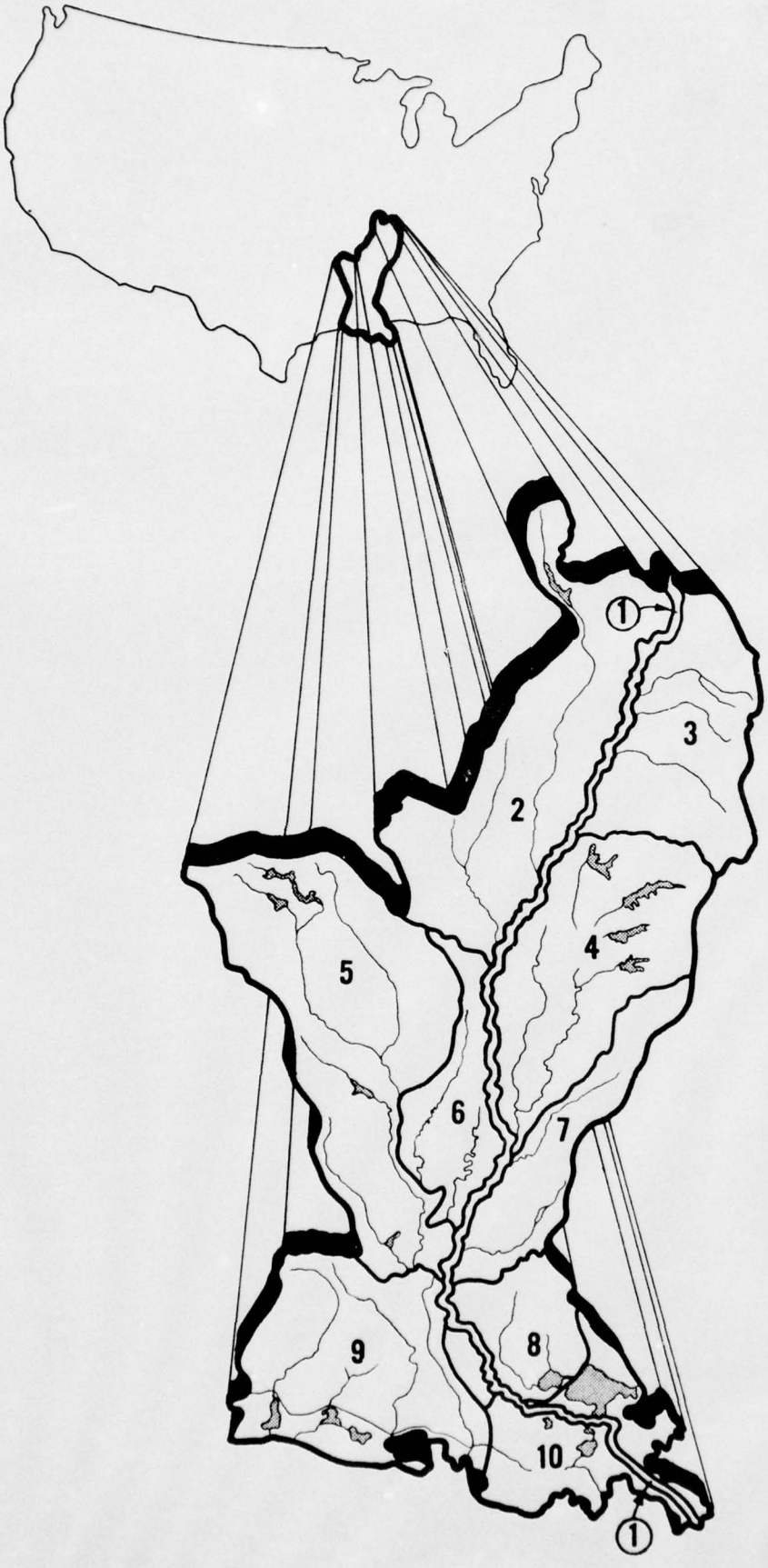
Each economic area has essentially two types of industries. One type constitutes the basic (or export) industries, represented by agriculture, mining, and manufacturing, which produce goods and services that generally are exported to other areas. In this way, an area earns the means with which to purchase the specialized goods and services of other areas. In addition to the basic or export industries, each area has another type of industries, termed residentiary industries, which are functionally related to the households and businesses of the area in that they produce most of the services and some of the goods required by the household sector and by local businesses as intermediate products. Each of the economic areas approaches self-sufficiency with respect to its residentiary industries.

These economic areas were the basic regional areas for which projections were made. Projections for WRPA's were derived by disaggregating the economic area projections in such a way that the data could be reaggregated for the desired river basins.

### Water Resource Planning Areas

Management programs for the development of water and water-related land resources are usually adapted to river basins. Accordingly, the Lower Mississippi Region is defined for the Lower Mississippi Region Comprehensive Study as that part of the United States drained by the Mississippi River below the mouth of the Ohio River (excluding the drainage areas of the Arkansas, White, and Red Rivers above the points of the highest backwater effects of the Mississippi River) plus the drainage areas of the coastal streams that discharge into the Gulf of Mexico between the Pearl and Sabine Rivers.

The Lower Mississippi Region in turn has been subdivided into ten planning areas according to its several river basins. Economic data on which forecasts are based, however, are available only by counties, so that in the Economics Appendix the ten WRPA's, except for WRPA 1, Land Between the Levees, follow county lines rather than exact hydrologic boundaries. A delineation of WRPA's according to county lines superimposed on river basins is shown in figure 1.




# REGIONAL SUMMARY

# REGIONAL SUMMARY

## NATIONAL ECONOMIC FORECAST

Table 1 presents a summary of data concerning population, employment, personal income, and earnings in the United States for selected years from 1968 to 2020. The GNP is expected to increase eightfold during the period of interest. This reflects an anticipated annual growth rate of 4 percent. Thus, the annual value (in 1967 dollars) of all goods and services will increase from $800 billion in 1968 to between $6 and $7 trillion in 2020.

Consistent with these forecasts, all segments of the economy will grow rapidly. Civilian employment will double during the 50-year period, totaling almost 164 million by 2020. The expansion reflects both an anticipated population growth rate of 1.3 percent and an increase in the percentage of the population which will be working from 39 percent in 1970 to 41 percent in 2020.

Per capita income throughout the United States will be four times as great in 2020 as in 1968. This means that a family of four persons can expect its income to steadily increase from an average of $10,000 to an average of $50,000 in terms of the purchasing power of the dollar in 1967, or to $70,000 in 1972 dollars.

The contribution to the total income of the United States will result from an expansion in all segments of the economy. Relatively, however, agricultural and mining activities will grow less rapidly than the total economy, while services, both private and governmental, manufacturing, and trade will contribute an increasingly larger proportion to total income.

Table 1 - Economic Profile Summary for United States 1/

| Parameter | Data for Indicated Years | | | | |
|---|---|---|---|---|---|
| | 1968 | 1980 | 2000 | 2010 | 2020 |
| Population (1 July) 2/ | 199,798,000 | 234,208,000 | 306,782,000 | 350,111,000 | 399,013,000 |
| Per Capita Income 3/ | 3,301 | 4,765 | 8,289 | 10,895 | 14,260 |
| Total Employment | 78,820,346 | 93,820,000 | 124,641,000 | 143,441,000 | 163,622,000 |
| Employment/Population Ratio | .39 | .40 | .41 | .41 | .41 |
| Earnings per Worker 3/ | 6,715 | 9,396 | 15,811 | 20,450 | 26,569 |
| Total Personal Income 3/ | 659,532,133 | 1,115,898,374 | 2,542,848,587 | 3,814,449,639 | 5,690,073,434 |
| Total Earnings 3/ | 529,247,675 | 881,560,094 | 1,970,738,624 | 2,953,511,710 | 4,347,216,051 |
| Agriculture, Forestry, & Fisheries | 18,400,736 | 19,855,395 | 25,493,390 | 33,173,554 | 44,457,351 |
| Agriculture | 18,117,069 | 19,449,249 | 24,784,064 | 32,235,414 | 43,241,401 |
| Forestry and Fisheries | 283,667 | 406,146 | 709,326 | 938,140 | 1,216,150 |
| Mining | 5,270,847 | 6,814,102 | 10,065,559 | 12,107,730 | 14,812,319 |
| Coal Mining | 1,181,694 | 1,559,710 | 1,851,662 | 2,081,070 | 2,432,300 |
| Crude Petroleum and Natural Gas | 2,447,309 | 3,155,355 | 4,215,911 | 4,690,701 | 5,212,399 |
| Metal Mining | 718,666 | 970,174 | 1,575,389 | 2,022,722 | 2,606,199 |
| Quarrying | 923,178 | 1,348,863 | 2,442,597 | 3,313,237 | 4,561,421 |
| Contract Construction | 31,652,034 | 51,121,779 | 110,055,292 | 161,455,080 | 236,614,987 |
| Manufacturing | 155,486,028 | 242,828,450 | 500,265,566 | 720,990,526 | 1,041,897,412 |
| Food and Kindred Products | 12,566,508 | 17,154,788 | 28,070,987 | 36,090,942 | 47,001,970 |
| Textile Mill Products | 5,375,981 | 7,536,012 | 12,843,569 | 16,887,669 | 22,501,657 |
| Apparel and Other Textiles | 6,769,881 | 9,704,031 | 17,432,392 | 23,601,092 | 32,318,931 |
| Printing and Publishing | 8,250,641 | 15,080,192 | 27,381,110 | 39,725,663 | 57,774,566 |
| Chemicals and Allied Products | 9,664,858 | 16,041,054 | 35,595,558 | 52,831,025 | 78,190,557 |
| Lumber and Furniture | 6,692,751 | 9,458,055 | 16,585,633 | 22,164,135 | 30,017,056 |
| Machinery, All | 32,684,209 | 56,727,739 | 132,531,759 | 200,448,536 | 300,645,347 |
| Machinery, Excl. Electrical | 17,410,923 | 27,852,469 | 59,115,420 | 86,255,987 | 125,844,650 |
| Electrical Equip. & Supplies | 15,275,282 | 28,875,270 | 73,416,339 | 114,194,549 | 174,800,697 |
| Transportation Equipment | 21,358,345 | 32,489,398 | 65,970,709 | 94,492,460 | 135,834,699 |
| Motor Vehicles and Equipment | 10,362,300 | 15,187,575 | 30,237,862 | 42,950,806 | 61,292,592 |
| Trans. Equip., Exc. Mtr. Vehicles | 10,996,045 | 17,301,823 | 35,732,847 | 51,541,654 | 74,542,107 |
| Other Manufacturing | 52,122,874 | 80,657,181 | 163,855,059 | 234,749,004 | 337,612,649 |
| Paper and Allied Products | 5,405,957 | 8,699,535 | 18,536,278 | 27,089,372 | 39,616,976 |
| Petroleum Refining | 2,403,925 | 3,234,296 | 5,299,348 | 6,801,517 | 8,905,468 |
| Primary Metals | 12,263,585 | 16,173,767 | 25,017,455 | 31,047,866 | 39,051,804 |
| Fabricated Metals & Ordnance | 14,047,208 | 23,374,565 | 52,300,175 | 77,869,073 | 115,375,235 |
| Miscellaneous Manufacturing | 18,004,201 | 29,175,018 | 62,699,805 | 91,941,176 | 134,663,168 |
| Transport., Commun., & Pub. Utilities | 36,524,415 | 56,816,977 | 116,398,035 | 167,348,203 | 241,305,688 |
| Wholesale and Retail Trade | 87,009,362 | 148,563,661 | 335,481,240 | 501,615,581 | 746,467,897 |
| Finance, Insurance, and Real Estate | 27,718,237 | 45,110,817 | 98,040,232 | 144,362,623 | 212,159,273 |
| Services | 77,185,384 | 145,219,534 | 368,579,286 | 573,022,927 | 876,784,730 |
| Government | 90,000,632 | 165,229,379 | 406,360,024 | 619,235,487 | 932,716,194 |
| Civilian Government | 74,911,656 | 146,378,480 | 374,582,239 | 578,114,054 | 879,295,971 |
| Armed Forces | 15,088,976 | 18,850,899 | 31,777,785 | 41,121,433 | 53,420,223 |

1/ Source: Water Resources Council.
2/ U. S. Bureau of Census figures show the 1970 population of the United States as 203,874,000.
3/ Per capita income and per worker earnings values are given in 1967 dollars; total personal income and earnings values are given in thousands of 1967 dollars.

Figure 2 shows historical and projected employment and population data for the Nation and for the Lower Mississippi Region under both Programs A and B for selected years from 1968 to 2020.

Economic growth for the Lower Mississippi Region in general follows the pattern projected for the Nation. OBERS' forecast adopted for Program A, however, is for regional employment to increase at only 1.1 percent annually, as compared with 1.4 percent nationally.

Program B has been developed to forecast the effects of a 1.4 percent employment growth rate for the Lower Mississippi Region on its future economy. Thus, total employment is projected to reach 4,620,000, rather than 3,917,000 (table 2). Historical and projected (using Program B assumptions) employment by WRPA's is shown in figure 3.

Table 2 - Economic Profile Summary for Lower Mississippi Region 1/

| Parameter | Data for Indicated Years | | | | | |
|---|---|---|---|---|---|---|
| | 1950 | 1960 | 1968 | 1980 | 2000 | 2020 |
| Population (1 July) 2/ | | | | | | |
| Program A | 5,545,348 | 5,826,287 | 6,295,977 | 6,741,000 | 8,156,000 | 10,196,000 |
| Program B | -- | -- | -- | 7,285,000 | 9,188,000 | 11,655,000 |
| Personal Income 3/ | | | | | | |
| Program A | 7,267,311 | 9,701,464 | 15,402,808 | 24,201,000 | 54,500,000 | 125,128,000 |
| Program B | -- | -- | -- | 26,535,000 | 63,032,000 | 145,221,000 |
| Per Capita 3/ | | | | | | |
| Program A | 1,311 | 1,655 | 2,447 | 3,590 | 6,682 | 12,076 |
| Program B | -- | -- | -- | 3,700 | 6,980 | 12,570 |
| Earnings 3/ | | | | | | |
| Total, Program A | 5,908,523 | 7,919,503 | 12,280,220 | 19,003,000 | 42,028,000 | 93,758,000 |
| Total, Program B | -- | -- | -- | 20,834,000 | 48,607,000 | 110,580,000 |
| Per Worker 3/ | | | | | | |
| Program A | 3,224 | 4,226 | 5,550 | 7,865 | 13,813 | 23,937 |
| Program B | -- | -- | -- | 7,865 | 13,813 | 23,937 |
| Employment | | | | | | |
| Total, Program A | 1,832,672 | 1,873,933 | 2,212,522 | 2,416,000 | 3,043,000 | 3,917,000 |
| Total, Program B | -- | -- | -- | 2,649,000 | 3,519,000 | 4,620,000 |
| Gross Manufacturing Product 3/ | | | | | | |
| Total, Program A | -- | -- | 4,186,000 | 7,027,000 | 16,666,000 | 37,979,000 |
| Total, Program B | -- | -- | -- | 7,704,000 | 19,275,000 | 44,793,000 |
| Gross Farm Marketing Receipts 3/ | | | | | | |
| Program A | -- | -- | 2,145,000 4/ | 2,770,000 | 3,284,000 | 3,841,000 |
| Program B | -- | -- | -- | 2,770,000 | 3,540,000 | 4,150,000 |

1/ Program A forecasts are based on OBERS projections as approved by the U. S. Water Resources Council; Program B forecasts reflect a regional employment growth rate equal to the national rate. Methodology for both programs is explained in the section on methodology at the end of this appendix.

2/ U. S. Bureau of Census figures show the 1970 population of the Lower Mississippi Region as 6,293,233.

3/ Personal income, earnings, gross manufacturing product, and gross farm marketing receipt values are given in thousands of 1967 dollars; per capita income and per worker earnings values are given in 1967 dollars.

4/ 1970 data.

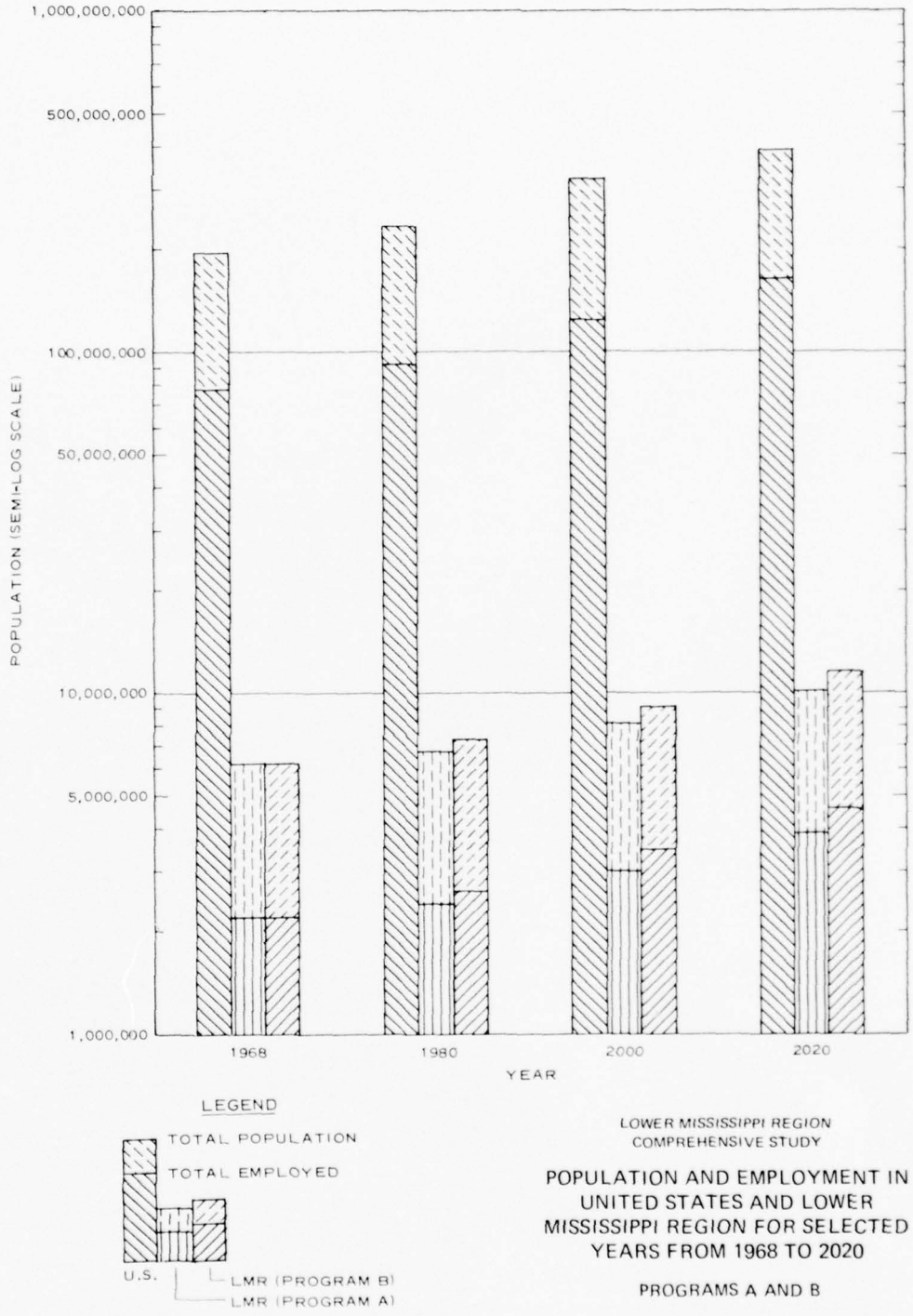
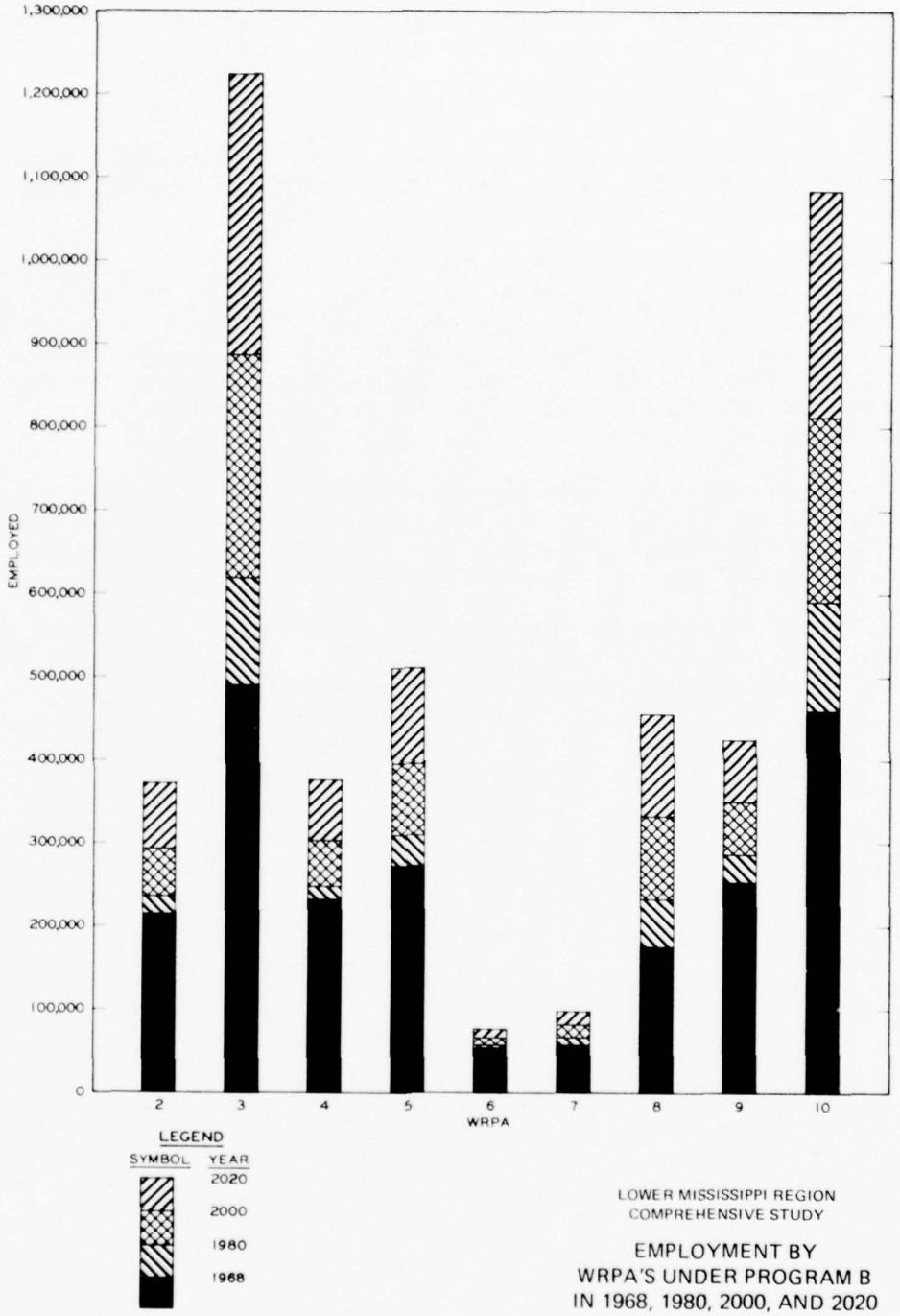

1,000,000,000
500,000,000
100,000,000
50,000,000
10,000,000
5,000,000
1,000,000
POPULATION (SEMI-LOG SCALE)
1968
1980
2000
2020
YEAR
LEGEND
TOTAL POPULATION
TOTAL EMPLOYED
U.S.
LMR (PROGRAM B)
LMR (PROGRAM A)
LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY
POPULATION AND EMPLOYMENT IN UNITED STATES AND LOWER MISSISSIPPI REGION FOR SELECTED YEARS FROM 1968 TO 2020
PROGRAMS A AND B

FIGURE 2




LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

EMPLOYMENT BY
WRPA'S UNDER PROGRAM B
IN 1968, 1980, 2000, AND 2020

FIGURE 3

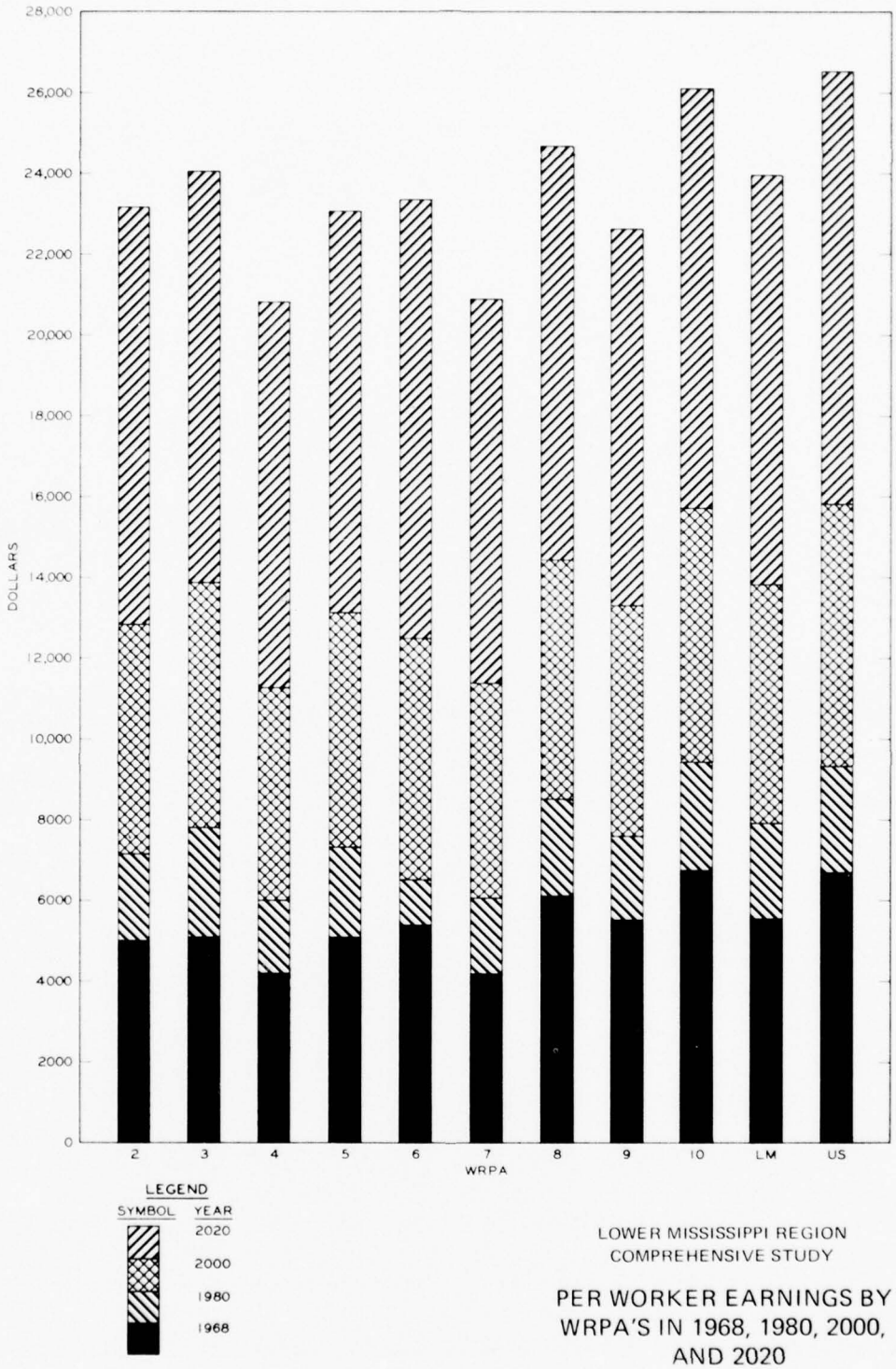
Population, based on the estimated number of persons to be employed in each WRPA and the estimated percentage of the population which will be working, should reach 11,655,000 by 2020 rather than 10,196,000 as projected under Program A.

Earnings per worker (see figure 4) will be the same under both programs, rising to $23,937 in terms of the purchasing power of 1967 dollars (or $29,000 in 1972 dollars).

An increase in the projected Program B per capita income occurs because a slightly higher percentage of the population is expected to be employed. OBERS forecasts that 41 percent of the population of the United States will be employed by 2020, but only 38 percent in the Lower Mississippi Region. Program B is based on the assumption that 40 percent of the Lower Mississippi Region's population will be working by 2020.

Economic output in terms of gross product originating (GPO) in the region is shown in table 3. By 2020, agricultural output will nearly double, crude petroleum production will be four times as great, and manufacturing output will be ten times higher.

Although expansion in most industries will follow national trends, agricultural output will lag slightly behind that for the Nation, while mining and manufacturing will expand at a slightly higher rate.




LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

PER WORKER EARNINGS BY WRPA'S IN 1968, 1980, 2000, AND 2020

FIGURE 4

Table 3 - Gross Product Originating by Major Industries in Lower Mississippi Region

| Industry | Gross Product Originating in Indicated Years thousands of 1967 dollars | | | | |
|---|---|---|---|---|---|
| | 1967 | 1968 | 1980 | 2000 | 2020 |
| Agriculture 1/ | | | | | |
| Program A | 1,981,052 | 2,145,000 2/ | 2,770,000 | 3,284,000 | 3,841,000 |
| Program B | -- | -- | 2,770,000 | 3,540,000 | 4,150,000 |
| Forestry 3/ | | | | | |
| Program A | -- | 201,500 2/ | 232,000 | 307,000 | 339,000 |
| Program B | -- | -- | 272,000 | 381,000 | 491,000 |
| Mining, Petroleum | | | | | |
| Program A | 1,981,052 | 2,099,915 | 3,130,000 | 4,239,000 | 7,350,000 |
| Program B | -- | -- | 3,432,000 | 4,903,000 | 8,668,000 |
| Quarrying | | | | | |
| Program A | 75,812 | 77,328 | 113,000 | 206,000 | 388,000 |
| Program B | -- | -- | 124,000 | 238,000 | 458,000 |
| Manufacturing | | | | | |
| Program A | 3,840,117 | 4,185,728 | 7,027,000 | 16,666,000 | 37,979,000 |
| Program B | -- | -- | 7,704,000 | 19,275,000 | 44,793,000 |
| Food & Kindred Products | | | | | |
| Program A | 543,057 | 564,779 | 701,000 | 1,108,000 | 1,808,000 |
| Program B | -- | -- | 768,000 | 1,281,000 | 2,133,000 |
| Textile Mill Products | | | | | |
| Program A | 64,567 | 67,795 | 120,000 | 245,000 | 486,000 |
| Program B | -- | -- | 132,000 | 283,000 | 573,000 |
| Chemical & Allied Products | | | | | |
| Program A | 597,122 | 680,719 | 1,302,000 | 3,595,000 | 9,070,000 |
| Program B | -- | -- | 1,427,000 | 4,157,000 | 10,698,000 |
| Paper & Allied Products | | | | | |
| Program A | 319,195 | 338,347 | 539,000 | 1,162,000 | 2,496,000 |
| Program B | -- | -- | 591,000 | 1,344,000 | 2,944,000 |
| Petroleum Refining | | | | | |
| Program A | 262,046 | 343,280 | 490,000 | 901,000 | 1,614,000 |
| Program B | -- | -- | 537,000 | 1,043,000 | 1,904,000 |
| Primary Metals | | | | | |
| Program A | 98,781 | 110,635 | 154,000 | 266,000 | 452,000 |
| Program B | -- | -- | 169,000 | 307,000 | 534,000 |
| Other Manufacturing | | | | | |
| Program A | 1,955,349 | 2,080,173 | 3,721,000 | 9,389,000 | 22,053,000 |
| Program B | -- | -- | 4,080,000 | 10,860,000 | 26,007,000 |

1/ Marketing receipts.
2/ 1970 data.
3/ Value at local point of delivery including stumpage, cutting, and hauling.

## MAJOR ECONOMIC TRENDS

### National

The most comprehensive and widely used measure of the national economy is the GNP. During the period 1950-1970, the average annual growth rate in GNP was 3.6 percent. However, the growth rate varied widely during that period. For the five-year period from 1960 to 1965, the growth rate averaged 4.8 percent; from 1965 to 1966, the rate jumped to 6.5 percent. On the other hand, there was a decline in GNP between 1969 and 1970 when measured in constant dollars.

It is projected that during the period 1970-2020, the GNP will grow at an average annual rate of 4 percent, based on the projected number of workers times their projected productivity. In this report, the projected number of workers was derived from the C series population projection of the Census Bureau. If the E series, which assumes zero population growth by the 2030's, had been used, the GNP growth rate would drop to 3.8 percent. However, the change in rate would occur after 1990, as it would require about 20 years for the change in birth rate to be effective.

The current dollar industrial distribution of GNP has changed significantly in the last two decades, reflecting the variation in growth characteristics of the various industries. Some industries such as agriculture have barely maintained the same dollar value of GPO, while GNP has risen about 235 percent (or 105 percent in constant dollar value as shown in table 4). In some other industries, GPO has increased more than 400 percent.

Within manufacturing, there were diverging trends, with some industries decreasing, some remaining constant, and some increasing as a percent of GNP. Among the six heavy water-using industries, food, textiles, and primary metals declined in relative importance, and chemicals, paper, and petroleum refining remained about constant.

Most of the commodity-producing industries fall below total earnings in projected growth rates because of the increasing importance in service industries (table 1).

These differences in the growth rates of the various industries are significant in a consideration of economic activity at the regional level because of variations in the types of industries which make up the economic base of the various regions. Regions which are predominantly dependent on nationally slow growing industries will not be expected to grow as rapidly as regions dependent on fast growing industries.

Table 4 - Selected National Aggregates 1/

| Year | Total Population | Employment Population Ratio | Total Employment | Hours Worked per Man Year (private economy) | Gross National Product 2/ | Total Earnings 2/ |
|---|---|---|---|---|---|---|
| 1950 | 151,326,000 | .38 | 57,475,000 | 2,127 | 417,819 | 258,740 |
| 1960 | 179,323,000 | .37 | 66,373,000 | 2,027 | 573,514 | 376,062 |
| 1968 | 199,798,000 | .39 | 78,820,000 | 1,977 | 832,147 | 529,247 |
| Rate of change 1950-1968 | 1.6% | -- | 1.4% | -0.4% | 3.9% | 4.1% |
| 1970 | 204,800,000 | .39 | 81,800,000 | 1,967 | 857,000 | -- |
| 1980 | 234,208,000 | .40 | 93,820,000 | 1,919 | 1,356,955 | 881,560 |
| 2000 | 306,782,000 | .41 | 124,641,000 | 1,825 | 2,946,931 | 1,970,738 |
| 2020 | 399,013,000 | .41 | 163,622,000 | 1,736 | 6,377,607 | 4,347,216 |
| Rate of change 1968-2020 | 1.3% | -- | 1.4% | -0.25% | 4.0% | 4.1% |

1/ Source: Bureau of Economic Analysis, U. S. Department of Commerce, and United States Water Resources Council, Economic Activity in the United States by Water Resources Regions and Subareas, Historical and Projected, 1929-2020, Volume 1, pages II-8 and II-9; Volume 3, pages 18 and 19.

2/ Values are given in millions of 1967 dollars.

## Lower Mississippi Region

Major trends throughout the Lower Mississippi Region during the past four decades have centered around the signal shift in employment from agriculture to other types of activity. During the 1930's, about 50 percent of the labor force worked on farms, but by 1970 the ratio had declined to 10 percent and is expected to fall to 2-1/2 percent by 2020. Conversely, employment in manufacturing has tripled.

### Population

The shift in employment from agricultural to other types of work is reflected in the future rate of growth among WRPA's. Areas with metropolitan centers, particularly Memphis, Baton Rouge, and New Orleans, will grow at rates noticeably higher than others. Distinctly rural WRPA's, i.e., WRPA's 2, 4, 6, and 7, will have a population growth of less than 50 percent between 1960 and 2020 under both Program A and B assumptions. Table 5 shows the Program A population forecasts for the Lower Mississippi Region.

For the entire Lower Mississippi Region, the population between

Table 5 - Program A Population Forecasts by WRPA's for Lower Mississippi Region 1/ 2/

| | Population for Indicated Years | | | | | |
|---|---|---|---|---|---|---|
| | 1950 | 1959 | 1968 | 1980 | 2000 | 2020 |
| Total, United States (July 1) | 151,871,000 | 177,124,000 | 199,797,900 | 234,208,000 | 306,782,000 | 399,013,000 |
| Index (1960 = 100) | 86 | 100 | 113 | 132 | 173 | 225 |
| Total, Lower Miss. Region (LMR) | 5,545,348 | 5,826,287 | 6,293,977 | 6,740,699 | 8,156,161 | 10,195,796 |
| Index (1960 = 100) | 95 | 100 | 108 | 116 | 140 | 175 |
| Percent of U. S. Population | 4 | 3 | 3 | 3 | 3 | 3 |
| WRPA 2, St. Francis-L. White | 777,234 | 664,597 | 640,402 | 625,372 | 684,126 | 795,495 |
| Index (1960 = 100) | 117 | 100 | 96 | 94 | 103 | 120 |
| Percent of LMR Population | 14 | 11 | 10 | 9 | 8 | 8 |
| WRPA 3, Memphis | 1,056,370 | 1,134,870 | 1,246,294 | 1,415,829 | 1,905,425 | 2,569,221 |
| Index (1960 = 100) | 93 | 100 | 110 | 125 | 168 | 226 |
| Percent of LMR Population | 19 | 19 | 20 | 21 | 25 | 25 |
| WRPA 4, Yazoo | 756,070 | 674,398 | 654,953 | 634,959 | 701,484 | 827,932 |
| Index (1960 = 100) | 112 | 100 | 97 | 94 | 104 | 123 |
| Percent of LMR Population | 14 | 12 | 10 | 9 | 9 | 8 |
| WRPA 5, Ouachita | 777,362 | 777,500 | 824,397 | 857,358 | 997,582 | 1,209,914 |
| Index (1960 = 100) | 100 | 100 | 106 | 110 | 128 | 156 |
| Percent of LMR Population | 14 | 13 | 13 | 13 | 12 | 12 |
| WRPA 6, Boeuf-Tensas | 214,955 | 107,601 | 193,490 | 179,424 | 178,590 | 192,809 |
| Index (1960 = 100) | 200 | 100 | 180 | 95 | 166 | 179 |
| Percent of LMR Population | 4 | 3 | 3 | 3 | 2 | 2 |
| WRPA 7, Big Black | 177,910 | 164,709 | 160,580 | 161,741 | 183,138 | 217,446 |
| Index (1960 = 100) | 108 | 100 | 97 | 98 | 111 | 132 |
| Percent of LMR Population | 3 | 3 | 3 | 2 | 2 | 2 |
| WRPA 8, Baton Rouge | 373,544 | 461,832 | 539,660 | 618,097 | 782,212 | 1,005,478 |
| Index (1960 = 100) | 81 | 100 | 117 | 134 | 169 | 217 |
| Percent of LMR Population | 7 | 8 | 9 | 9 | 10 | 10 |
| WRPA 9, Lake Charles | 534,509 | 648,826 | 750,899 | 769,718 | 859,720 | 993,875 |
| Index (1960 = 100) | 83 | 100 | 116 | 119 | 133 | 154 |
| Percent of LMR Population | 10 | 11 | 12 | 11 | 11 | 10 |
| WRPA 10, New Orleans | 877,394 | 1,104,954 | 1,283,302 | 1,478,201 | 1,863,884 | 2,385,626 |
| Index (1960 = 100) | 79 | 100 | 116 | 134 | 169 | 216 |
| Percent of LMR Population | 16 | 19 | 20 | 22 | 23 | 23 |

1/ Values calculated based on OBERS data.
2/ For Program B forecasts, see individual WRPA tables.

1960 and 2020 will grow by 75 percent under Program A and 100 percent under Program B, as compared with an increase of 125 percent for the Nation (table 5).

Similarly, the employment shift will result in a continuous movement of persons from rural to urban residence. In 1970, over 59 percent of the Lower Mississippi Region's population was classified by the Census Bureau as urban, and the projection is that at least 76 percent will be urban by 2020 (table 6). In fact, indications are that large urban centers will grow faster than small centers so that by 2020 about half of the Lower Mississippi Region's population will be in the three metropolitan areas of Memphis, Baton Rouge, and New Orleans.

Employment

Slightly more than one-third (35 percent) of the Lower Mississippi

Table 6 - Lower Mississippi Region (LMR) Urban-Rural Population Forecasts 1/

| Area | Percent of Total Population for Indicated Years | | | | | | Avg. Annual Historic Growth, percent |
|---|---|---|---|---|---|---|---|
| | 1950 | 1960 | 1970 | 1980 | 2000 | 2020 | |
| WRPA 2 | | | | | | | |
| Urban | 23 | 29 | 40 | 46 | 56 | 64 | +2.8 |
| Rural | 77 | 71 | 60 | 54 | 44 | 36 | -1.3 |
| WRPA 3 | | | | | | | |
| Urban | 53 | 61 | 70 | 75 | 82 | 88 | +1.4 |
| Rural | 47 | 39 | 30 | 25 | 18 | 12 | -2.3 |
| WRPA 4 | | | | | | | |
| Urban | 20 | 30 | 37 | 41 | 49 | 56 | +3.1 |
| Rural | 80 | 70 | 63 | 59 | 51 | 44 | -1.2 |
| WRPA 5 | | | | | | | |
| Urban | 36 | 45 | 49 | 54 | 62 | 69 | +1.6 |
| Rural | 64 | 55 | 51 | 46 | 38 | 31 | -1.1 |
| WRPA 6 | | | | | | | |
| Urban | 23 | 34 | 39 | 42 | 48 | 53 | +2.7 |
| Rural | 77 | 66 | 61 | 58 | 52 | 47 | -1.2 |
| WRPA 7 | | | | | | | |
| Urban | 24 | 28 | 29 | 32 | 39 | 45 | +1.0 |
| Rural | 76 | 72 | 71 | 68 | 61 | 55 | -0.3 |
| WRPA 8 | | | | | | | |
| Urban | 47 | 53 | 58 | 61 | 68 | 73 | +1.1 |
| Rural | 53 | 47 | 42 | 39 | 32 | 27 | -1.2 |
| WRPA 9 | | | | | | | |
| Urban | 44 | 53 | 58 | 62 | 67 | 72 | +1.4 |
| Rural | 56 | 47 | 42 | 38 | 33 | 28 | -1.4 |
| WRPA 10 | | | | | | | |
| Urban | 81 | 84 | 83 | 83 | 84 | 85 | +0.1 |
| Rural | 19 | 16 | 17 | 17 | 16 | 15 | -0.6 |
| LMR | | | | | | | |
| Urban | 43 | 53 | 59 | 64 | 70 | 76 | +1.6 |
| Rural | 57 | 47 | 41 | 36 | 30 | 24 | -1.0 |

1/ Historical data from U. S. Bureau of Census.

Region's population was employed during the 1960's. This proportion gradually will increase so that by 2020 the employment participation rate will reach 40 percent, as compared with 41 percent for the Nation. Thus, by 2020 total employment in the region will reach 3.9 million under Program A or 4.6 million under Program B (table 7).

Employment trends by major industries are presented in table 7 for the Lower Mississippi Region. Offsetting the decline in agricultural activities are major expansions in manufacturing and other areas. Food processing is the only manufacturing activity showing a noticeable employment decline, i.e., from 53,000 in 1960 to 51,000 in 2020 under Program B.

Earnings and Income

Earnings per worker for the region were 80 percent as great as earnings for the Nation during 1968. Future changes in employment characteristics and greater urbanization will bring the regional average up to 90 percent of the national average by 2020.

The lower per worker earnings in the Lower Mississippi Region reflect the fact that earnings are higher in large cities than in small cities, and are higher in urban than in rural areas. Thus, the absence of a megalopolis and a greater dependence on agriculture result in low average per worker earnings.

Anticipated technological advancements, however, will bring about phenomenal increases in earnings throughout the Nation. By 2020, the average per worker earnings for the Lower Mississippi Region will be $30,000 in 1972 dollars, or $23,937 based on the equivalent dollar purchasing power existing in 1967 (tables 8 and 9).

Total regional personal income in dollars of constant purchasing power, including incomes of business and farm proprietors, dividends and interest, and earnings from wages and salaries, will be 15 times greater in 2020 than in 1960, or eight times greater than in 1968 (table 8). Translated to a per capita basis, personal income will increase five times from 1968 to 2020. In purchasing power of 1972 dollars, the average income of a family of four in the Lower Mississippi Region will be $60,000, as compared with $70,000 for the Nation. Such projections reflect the expected continued increase in productivity per worker of 3 percent per year.

Gross Product Originating

A summary of anticipated increases in the production of physical goods by major industries is given in tables 3 and 10 for the Lower Mississippi Region. The value of the output is given in terms of 1967 prices. Thus, if production of a specific commodity group in 1967 is known, such as tons of paper, an approximation of expected production

Table 7 - Employment by Major Industries in Lower Mississippi Region

| Industry | Number of Persons Employed in Indicated Years | | | | |
|---|---|---|---|---|---|
| | 1950 | 1960 | 1980 | 2000 | 2020 |
| Total, Program A | 1,832,672 | 1,874,066 | 2,416,000 | 3,043,000 | 3,917,000 |
| Total, Program B | -- | -- | 2,649,000 | 3,519,000 | 4,620,000 |
| Agriculture | | | | | |
| Program A | 569,900 1/ | 296,079 1/ | 135,000 1/ | 103,000 1/ | 101,000 1/ |
| Program B | -- | -- | 137,000 1/ | 112,000 1/ | 110,000 1/ |
| Forestry & Fisheries | | | | | |
| Program A | -- | -- | -- | -- | -- |
| Program B | -- | -- | -- | -- | -- |
| Mining | | | | | |
| Program A | 23,817 | 37,061 | 52,000 | 51,000 | 50,000 |
| Program B | -- | -- | 57,000 | 59,000 | 59,000 |
| Manufacturing | | | | | |
| Program A | 255,527 | 322,926 | 484,000 | 629,000 | 803,000 |
| Program B | -- | -- | 531,000 | 728,000 | 948,000 |
| Food & Kindred Products | | | | | |
| Program A | 39,443 | 53,101 | 48,000 | 45,000 | 43,000 |
| Program B | -- | -- | 53,000 | 52,000 | 51,000 |
| Textile Mill Products | | | | | |
| Program A | 8,772 | 8,894 | 12,000 | 14,000 | 15,000 |
| Program B | -- | -- | 13,000 | 16,000 | 18,000 |
| Chemical & Allied Products | | | | | |
| Program A | 19,143 | 27,308 | 49,000 | 75,000 | 106,000 |
| Program B | -- | -- | 54,000 | 87,000 | 125,000 |
| Paper & Allied Products | | | | | |
| Program A | 16,967 | 25,259 | 30,000 | 39,000 | 50,000 |
| Program B | -- | -- | 33,000 | 45,000 | 60,000 |
| Petroleum Refining | | | | | |
| Program A | 17,431 | 19,151 | 16,000 | 15,000 | 16,000 |
| Program B | -- | -- | 17,000 | 18,000 | 19,000 |
| Primary Metals | | | | | |
| Program A | 2,873 | 7,024 | 10,000 | 11,000 | 12,000 |
| Program B | -- | -- | 11,000 | 13,000 | 15,000 |
| Other Manufacturing | | | | | |
| Program A | 150,898 | 184,189 | 319,000 | 430,000 | 561,000 |
| Program B | -- | -- | 350,000 | 497,000 | 660,000 |
| All Other | | | | | |
| Program A | 983,428 | 1,218,000 | 1,745,000 | 2,259,000 | 2,963,000 |
| Program B | -- | -- | 1,924,000 | 2,620,000 | 3,503,000 |

1/ Includes forestry and fisheries data.

Table 8 - Lower Mississippi Region Population, Employment, Personal Income, and Earnings for Selected Years from 1968 to 2020 1/

| Parameter | Program A Data for Indicated Years | | | | |
|---|---|---|---|---|---|
| | 1968 | 1980 | 2000 | 2010 | 2020 |
| Population (1 July) 2/ | 6,295,977 | 6,740,699 | 8,156,161 | 9,104,275 | 10,195,796 |
| Per Capita Income 3/ | 2,447 | 3,590 | 6,682 | 9,017 | 12,076 |
| Relative Per Capita Income (U. S. = 1.00) | .74 | .75 | .81 | .85 | .85 |
| Total Employment | 2,212,522 | 2,416,028 | 3,042,710 | 3,461,987 | 3,916,836 |
| Employment/Population Ratio | .35 | .36 | .37 | .38 | .38 |
| Earnings per Worker | 5,550 | 7,865 | 13,813 | 18,163 | 23,937 |
| Relative Earnings per Worker (U. S. = 1.00) | .83 | .84 | .67 | .89 | .90 |
| Total Personal Income 3/ | 15,402,808 | 24,200,507 | 54,500,385 | 82,095,900 | 125,128,419 |
| Total Earnings 3/ | 12,280,220 | 19,005,061 | 42,027,991 | 62,879,652 | 95,758,152 |
| Agriculture, Forestry, & Fisheries | 1,251,099 | 1,038,641 | 1,332,291 | 1,733,975 | 2,329,622 |
| Agriculture | 1,232,087 | 1,011,217 | 1,280,520 | 1,665,571 | 2,236,418 |
| Forestry and Fisheries | 19,012 | 27,425 | 51,770 | 70,402 | 93,204 |
| Mining | 450,991 | 636,140 | 954,830 | 1,135,259 | 1,348,240 |
| Coal Mining | W 4/ | S 5/ | S | S | S |
| Crude Petroleum and Natural Gas | 400,296 | 568,070 | 836,815 | 974,827 | 1,131,849 |
| Metal Mining | W | W | W | W | W |
| Quarrying | 41,998 | 60,472 | 109,855 | 149,453 | 206,282 |
| Contract Construction | W | W | W | W | W |
| Manufacturing | 2,550,755 | 4,103,769 | 9,159,252 | 13,589,852 | 20,104,856 |
| Food and Kindred Products | W | W | W | W | W |
| Textile Mill Products | 49,121 | 85,811 | 175,417 | 246,400 | 346,811 |
| Apparel and Other Textiles | W | W | W | W | W |
| Printing and Publishing | 79,448 | 125,698 | 294,671 | 450,089 | 689,347 |
| Chemicals and Allied Products | 296,534 | W | W | W | W |
| Lumber and Furniture | 303,589 | 456,913 | 845,708 | 1,151,725 | 1,581,389 |
| Machinery, All | W | 460,344 | 1,309,421 | 2,125,332 | 3,376,064 |
| Machinery, Excl. Electrical | W | 233,439 | 615,974 | 979,478 | 1,541,637 |
| Electrical Equip. & Supplies | 108,632 | 226,905 | 693,447 | 1,145,854 | 1,834,427 |
| Transportation Equipment | 163,415 | 286,158 | 700,839 | 1,070,950 | 1,615,285 |
| Motor Vehicles and Equipment | 18,988 | 33,428 | 76,242 | 113,605 | 168,586 |
| Trans. Equip., Excl. Mtr. Vehicles | 144,427 | 252,730 | 624,597 | 957,345 | 1,446,697 |
| Other Manufacturing | 924,561 | W | W | W | W |
| Paper and Allied Products | 193,640 | 310,758 | 667,208 | 977,657 | 1,433,681 |
| Petroleum Refining | 151,855 | 206,329 | 356,115 | 465,721 | 618,286 |
| Primary Metals | 74,192 | 100,108 | 172,692 | 224,053 | 293,996 |
| Fabricated Metals & Ordnance | 232,556 | W | W | W | W |
| Miscellaneous Manufacturing | 272,318 | 469,460 | 1,124,685 | 1,711,861 | 2,576,871 |
| Transport., Commun., & Pub. Utilities | W | W | W | W | W |
| Wholesale and Retail Trade | W | W | W | W | W |
| Finance, Insurance, and Real Estate | 491,614 | 770,439 | 1,737,205 | 2,621,698 | 3,941,577 |
| Services | 1,550,701 | 2,664,543 | 6,743,076 | 10,602,985 | 16,436,640 |
| Government | 2,001,721 | 3,563,142 | 8,721,588 | 13,355,211 | 20,234,048 |
| Civilian Government | 1,664,217 | 3,119,867 | 7,980,479 | 12,399,153 | 18,995,671 |
| Armed Forces | 337,504 | 443,276 | 741,109 | 956,059 | 1,238,377 |

1/ Source: Water Resources Council (see addendum for later revisions, table 94).
2/ U. S. Bureau of Census figures show the 1970 population of the Lower Mississippi Region as 6,293,233.
3/ Per capita income and per worker earnings value are given in 1967 dollars; total personal income and earnings values are given in thousands of 1967 dollars.
4/ W—withheld to avoid disclosing company confidential information.
5/ S—too small to be projected.

Table 9 - Earnings by Major Industries in Lower Mississippi Region 1/

| Industry | Earnings for Indicated Years 2/ | | | | | |
|---|---|---|---|---|---|---|
| | 1950 | 1959 | 1968 | 1980 | 2000 | 2020 |
| Total, Program A | 5,908,523 | 7,919,503 | 12,280,220 | 19,003,000 | 42,028,000 | 93,758,000 |
| Total, Program B | -- | -- | -- | 20,834,000 | 48,607,000 | 110,581,000 |
| Per Worker | | | | | | |
| Program A | 3,224 | 4,226 | 5,550 | 7,865 | 13,813 | 23,937 |
| Program B | -- | -- | -- | 7,865 | 13,813 | 23,937 |
| Agriculture | | | | | | |
| Program A | 1,272,921 | 1,115,692 | 1,232,087 | 1,011,000 | 1,281,000 | 2,236,000 |
| Program B | -- | -- | -- | 1,109,000 | 1,481,000 | 2,638,000 |
| Forestry & Fisheries | | | | | | |
| Program A | 25,986 | 18,886 | 19,012 | 27,000 | 52,000 | 93,000 |
| Program B | -- | -- | -- | 30,000 | 60,000 | 110,000 |
| Mining | | | | | | |
| Program A | 137,298 | 344,697 | 450,991 | 636,000 | 955,000 | 1,548,000 |
| Program B | -- | -- | -- | 697,000 | 1,104,000 | 1,590,000 |
| Manufacturing | | | | | | |
| Program A | 977,238 | 1,431,140 | 2,550,755 | 4,104,000 | 9,159,000 | 20,105,000 |
| Program B | -- | -- | -- | 4,499,000 | 10,593,000 | 23,712,000 |
| Food & Kindred Products | | | | | | |
| Program A | 181,017 | 236,574 | 317,722 | 369,000 | 558,000 | 898,000 |
| Program B | -- | -- | -- | 405,000 | 645,000 | 1,059,000 |
| Textile Mill Products | | | | | | |
| Program A | 29,202 | 31,659 | 49,121 | 86,000 | 175,000 | 347,000 |
| Program B | -- | -- | -- | 94,000 | 203,000 | 409,000 |
| Chemical & Allied Products | | | | | | |
| Program A | 87,638 | 165,523 | 296,534 | 528,000 | 1,304,000 | 3,015,000 |
| Program B | -- | -- | -- | 579,000 | 1,508,000 | 3,556,000 |
| Paper & Allied Products | | | | | | |
| Program A | 76,694 | 129,903 | 193,640 | 311,000 | 667,000 | 1,434,000 |
| Program B | -- | -- | -- | 341,000 | 772,000 | 1,691,000 |
| Petroleum Refining | | | | | | |
| Program A | 93,798 | 123,659 | 151,855 | 206,000 | 356,000 | 618,000 |
| Program B | -- | -- | -- | 226,000 | 412,000 | 729,000 |
| Primary Metals | | | | | | |
| Program A | 8,685 | 44,828 | 74,192 | 100,000 | 173,000 | 294,000 |
| Program B | -- | -- | -- | 110,000 | 200,000 | 347,000 |
| Other Manufacturing | | | | | | |
| Program A | 500,204 | 698,994 | 1,467,691 | 2,504,000 | 5,926,000 | 13,499,000 |
| Program B | -- | -- | -- | 2,744,000 | 6,853,000 | 15,921,000 |
| All Other | | | | | | |
| Program A | 3,495,080 | 5,009,088 | 8,027,375 | 13,225,000 | 30,581,000 | 69,976,000 |
| Program B | -- | -- | -- | 14,499,000 | 35,369,000 | 82,531,000 |

1/ Program A from OBERS data.
2/ All earnings except per worker earnings are given in thousands of 1967 dollars; per worker earnings are given in 1967 dollars.

Table 10 - Index of Output by Major Industries in Lower Mississippi Region

| Industry | Index of Output for Indicated Years 1/ | | | | |
|---|---|---|---|---|---|
| | 1967 | 1968 | 1980 | 2000 | 2020 |
| Agriculture | | | | | |
| Program A | -- | 100 2/ | 129 | 156 | 179 |
| Program B | -- | -- | 129 | 168 | 192 |
| Forestry | | | | | |
| Program A | -- | 100 2/ | 115 | 153 | 168 |
| Program B | -- | -- | 135 | 189 | 244 |
| Mining, Petroleum | | | | | |
| Program A | 100 | 106 | 158 | 214 | 371 |
| Program B | -- | -- | 173 | 248 | 438 |
| Quarrying | | | | | |
| Program A | 100 | 102 | 149 | 272 | 512 |
| Program B | -- | -- | 165 | 315 | 604 |
| Manufacturing | | | | | |
| Program A | 100 | 109 | 185 | 434 | 989 |
| Program B | -- | -- | 201 | 502 | 1,166 |
| Food & Kindred Products | | | | | |
| Program A | 100 | 104 | 129 | 204 | 333 |
| Program B | -- | -- | 141 | 236 | 393 |
| Textile Mill Products | | | | | |
| Program A | 100 | 105 | 186 | 380 | 752 |
| Program B | -- | -- | 204 | 439 | 887 |
| Chemical & Allied Products | | | | | |
| Program A | 100 | 114 | 218 | 602 | 1,519 |
| Program B | -- | -- | 239 | 696 | 1,792 |
| Paper & Allied Products | | | | | |
| Program A | 100 | 106 | 169 | 364 | 782 |
| Program B | -- | -- | 185 | 421 | 922 |
| Petroleum Refining | | | | | |
| Program A | 100 | 131 | 187 | 344 | 616 |
| Program B | -- | -- | 205 | 398 | 727 |
| Primary Metals | | | | | |
| Program A | 100 | 112 | 156 | 269 | 458 |
| Program B | -- | -- | 171 | 311 | 540 |
| Other Manufacturing | | | | | |
| Program A | 100 | 106 | 177 | 420 | 955 |
| Program B | -- | -- | 194 | 486 | 1,126 |

1/ 1967 = 100.
2/ 1970 used as base.

can be calculated by applying the appropriate index for the future year.

Several dramatic changes in the future demand for goods are indicated by the production forecasts. Output by chemical industries in general will be 15 to 18 times as much in 2020 as in 1967 (table 10). Agricultural production, on the other hand, will barely double, even under Program B assumptions.

Future water needs for each industry can be estimated by applying consumption coefficients to the production forecasts. Adjustments of the consumption coefficients for future years should be made in light of anticipated efficiency in water utilization and water pollution restrictions.

## Industry Potentials

Economic output in all industries is expected to expand steadily during the next 50 years. Overall, agricultural production will double, petroleum mining output will quadruple, and manufacturing gross product will expand tenfold. Especially important is the projection that output by chemical industries will be 14 times greater in 2020 than in 1968.

Detailed information concerning existing agricultural land use and needs is presented in Appendix F, Land Resources. It should be noted that other appendixes of the study usually are based on the exact hydrologic boundary of each WRPA in contrast to the Economics Appendix which follows the Water Resources Council delineation according to county lines. The following paragraphs summarize agricultural data for the Lower Mississippi Region.

### Agriculture

Historical, current, and projected future agricultural activity in the Lower Mississippi Region provides a basis for estimating the agricultural land and water needs to meet the national demand for food, feed, fiber, and related resources. The primary purpose of this agricultural analysis is to provide assistance in evaluating the needs and problems associated with water and related land resources management.

Current and future needs for natural resources depend on population, employment, income, and agricultural and industrial development. The agricultural economy was analyzed to cover the four study standard planning time periods: (1) historical years 1947 to 1970, with 1970 regarded as the base year; (2) the year 1980; (3) the year 2000; and (4) the year 2020.

Agriculture is an important part of the total economy of the Lower

Mississippi Region. The Mississippi River and its tributaries constitute a distinct physiocultural region. This region's soils and water resources and its long growing season make it ideal for production of a variety of row and close-seeded crops, for the growth of valuable forest species, and for the production of livestock and livestock products. In addition, the water and land resources, under different tenure arrangements, provide an invaluable outlet for many hunting, fishing, and other recreational opportunities.

The land and water resource base. Since current and future agricultural production is primarily predicated upon the availability and quality of land, a definite land and water base was established to aid in interpreting changes that are forecast. The land and water base includes the total area within county and parish lines for all WRPA's in the Lower Mississippi Region.

The Lower Mississippi Region (political or civil boundary) encompasses an area of 67,691,520 acres. The total area is stratified into several classifications and subclassifications, i.e., agricultural land, nonagricultural land, and large water areas.

In 1970, agricultural land accounted for 61.3 million acres, or 91 percent of the total area; nonagricultural land accounted for 3.6 million acres, or 5 percent of the total area; and large water areas accounted for 2.9 million acres, or 4 percent of the total area. Of the 61.3 million acres of agricultural land in the basin in 1970, 34.0 million acres were in farms.

Farm structure. An inventory of existing farm resources provides a fundamental aid in formulating and proposing plans for water and water-related land resource development, conservation, and use. Agricultural data are presented as an aid in interpreting the meaning and significance of changes in agricultural production and resource use.

The amount of farmland in the region declined 9 percent during the period 1949-1970. A number of forces are at work that have resulted in a reduction in land in farms. Part of the decrease can be attributed to urban expansion, with both factories and homes being established in rural areas; part to the conversion of cropland and pastureland to nonfarm forest land; and part to farmland being taken away for new highway and similar construction. In addition, land is increasingly being sought for recreation and wildlife pursuits. Competition for the use of land is currently attracting much attention.

Total farms in 1970 numbered 142,646, or 38,689 less than in 1964 and 289,132 less than in 1949. It is anticipated that the number of farms will continue to decline in future years, but at a lower rate than that prevailing over the past two decades.

Despite the decline in number of farms and farmers, agriculture is an expanding industry in the Lower Mississippi Region. An expanded output of agricultural commodities coupled with a decline in farm numbers and farm population stems from a large growth in production efficiency arising from the increased use of farm machinery, fertilizers, custom services, conservation programs, and other forms of improved technology.

Region farms averaged 239 acres in 1970 (table 11), as compared with 87 acres in 1949. The average farm size varies by WRPA's from 140 acres to 351 acres.

In 1970, most of the region farms (45,464 farms, or 32 percent of the total) were in the size range of 10 to 49 acres. Those in the size range 260 to 499 acres numbered 15,336, or 11 percent of the total. Only 5 percent of the total farms were 1,000 acres or larger (table 11).

Farms are grouped into two major categories, commercial and noncommercial. Farms with sales amounting to $2,500 or more per annum are classified as commercial. Sixty-four percent of the farms in the region were classified as commercial in 1970, and 36 percent as part time or noncommercial.

Farm tenure concerns the respective rights of individuals in the use of land and land resources associated with the land required for agricultural production. The tenure arrangements under which farmland is operated may affect the way land is used and the amounts of capital and labor used with the land. Thus, the tenure arrangement under which farmland is operated affects the total agricultural production, farm income, and the status of farm families.

Of the 142,646 farms in the region in 1970, 75,544 were operated by full owners, 40,481 by part owners, 25,982 by tenants, and 639 by managers (table 11).

The principal crops grown, in terms of land used, were soybeans, cotton, rice, hay, and corn. These five crops accounted for 93 percent of the total harvested acreage in 1970.

The production of livestock and livestock and poultry products is an important segment of the agricultural economy of the region but less so than crop production. Marketing receipts from livestock and livestock products totaled $373 million in 1970 (table 11).

Farm income data are presented in table 11. The 1970 farm marketings totaled $2.1 billion and were the principal component of farm income. Marketing receipts are those from crops and livestock. Currently, crops account for 83 percent of marketing receipts, and



Agriculture



Forestry (timber products)



Mining (offshore petroleum)



*from airplane parts*



*to model kitchens*

Manufacturing

Industries in the Lower Mississippi Region

Table II - Agricultural Resource Use and Status in Lower Mississippi Region 1/

| Parameter | Unit of Measurement | Amount in 1970 |
|---|---|---|
| Farms | Number | 142,646 |
| Average Size of Farms | Acres | 259 |
| Farms by Size | | |
| Less than 10 Acres | Number | 9,604 |
| 10 to 49 Acres | Number | 45,464 |
| 50 to 69 Acres | Number | 11,181 |
| 70 to 99 Acres | Number | 13,965 |
| 100 to 139 Acres | Number | 11,708 |
| 140 to 179 Acres | Number | 8,701 |
| 180 to 219 Acres | Number | 5,810 |
| 220 to 259 Acres | Number | 4,154 |
| 260 to 499 Acres | Number | 15,556 |
| 500 to 999 Acres | Number | 10,050 |
| 1,000 to 1,999 Acres | Number | 4,675 |
| 2,000 Plus Acres | Number | 2,028 |
| Farms by Type | | |
| Field Crop | Number | 65,747 |
| Vegetable | Number | 959 |
| Fruit and Nut | Number | 869 |
| Poultry | Number | 1,957 |
| Dairy | Number | 5,564 |
| Livestock | Number | 12,254 |
| General | Number | 5,022 |
| Miscellaneous | Number | 54,294 |
| Farms by Economic Class | | |
| Commercial | Number | 91,999 |
| Class I | Number | 16,445 |
| Class II | Number | 15,286 |
| Class III | Number | 10,928 |
| Class IV | Number | 12,658 |
| Class V | Number | 17,550 |
| Class VI | Number | 21,734 |
| Other | Number | 50,647 |
| Farms by Tenure | | |
| Full Owners | Number | 75,544 |
| Part Owners | Number | 40,481 |
| Managers | Number | 659 |
| Tenants | Number | 25,982 |
| Land in Farms | Acres | 34,025,000 |
| Cropland | Acres | 19,827,285 |
| Harvested | Acres | 14,747,470 |
| Pastured | Acres | 3,524,976 |
| Not Harvested or Pastured | Acres | 1,754,869 |
| Forest | Acres | 7,921,250 |
| Pastured | Acres | 3,778,502 |
| Not Pastured | Acres | 4,142,948 |
| Pasture | Acres | 4,404,555 |
| Other | Acres | 1,871,950 |
| Use of Cropland Harvested | | |
| Cotton | Acres | 3,338,112 |
| Corn | Acres | 672,000 |
| Sorghum | Acres | 21,400 |
| Oats | Acres | 141,150 |
| Rice | Acres | 900,080 |
| Barley | Acres | 6,500 |
| Irish Potatoes | Acres | 3,430 |
| Sweet Potatoes | Acres | 25,175 |
| Tobacco | Acres | 3,634 |
| Sugarcane | Acres | 312,000 |

| Parameter | Unit of Measurement | Amount in 1970 |
|---|---|---|
| Use of Cropland Harvested (Continued) | | |
| Wheat | Acres | 556,351 |
| Rye | Acres | 10,500 |
| Peanuts | Acres | 2,844 |
| Soybeans | Acres | 7,749,774 |
| Cowpeas | Acres | 4,425 |
| Hay | Acres | 982,000 |
| Vegetables | Acres | 55,700 |
| Orchards | Acres | 64,400 |
| Miscellaneous | Acres | 6,075 |
| Total | Acres | 14,747,470 |
| Agricultural Crop Production | | |
| Cotton | Bales | 4,317,345 |
| Cottonseed | Tons | 1,869,411 |
| Corn | Bushels | 58,851,000 |
| Sorghum | Bushels | 975,500 |
| Oats | Bushels | 6,626,550 |
| Rice | Bushels | 91,494,748 |
| Barley | Bushels | 254,000 |
| Irish Potatoes | Bushels | 436,150 |
| Sweet Potatoes | Bushels | 5,367,250 |
| Tobacco | Pounds | 13,521,700 |
| Sugarcane | Tons | 8,291,000 |
| Wheat | Bushels | 18,888,540 |
| Rye | Bushels | 200,000 |
| Peanuts | Pounds | 1,791,250 |
| Soybeans | Bushels | 182,108,825 |
| Cowpeas | Bushels | 59,825 |
| Hay | Tons | 1,438,079 |
| Vegetables | | Not Reported |
| Orchards | | Not Reported |
| Miscellaneous | | Not Reported |
| Livestock Inventory | | |
| Cattle and Calves | Number | 3,860,515 |
| Milk Cows | Number | 294,257 |
| Hogs and Pigs | Number | 1,204,364 |
| Sheep and Lambs | Number | 162,500 |
| Chickens | Number | 14,510,100 |
| Broilers | Number | 89,550,600 |
| Turkeys | Number | 52,000 |
| Livestock Production | | |
| Beef (Net Liveweight) | Kips | 883,304 |
| Pork (Net Liveweight) | Kips | 350,785 |
| Lamb (Net Liveweight) | Kips | 1,475 |
| Chickens (Net Liveweight) | Kips | 268,573 |
| Turkeys (Net Liveweight) | Kips | 5,081 |
| Eggs | Dozens | 204,558,000 |
| Milk | Kips | 1,364,944 |
| Farm Income | | |
| Crops | Dollars | 1,771,682,780 |
| Field | Dollars | 1,727,455,829 |
| Vegetable | Dollars | 11,782,362 |
| Fruit and Nuts | Dollars | 12,520,343 |
| Forestry and Horticulture | Dollars | 19,936,046 |
| Livestock, Dairy, and Poultry | Dollars | 375,307,220 |
| Other | Dollars | 348,400,000 |
| Total Gross Income | Dollars | 2,495,400,000 |
| Production Expense | Dollars | 1,745,380,000 |
| Realized Net Farm Income | Dollars | 748,020,000 |
| Net Income per Farm | Dollars | 5,244 |

1/ Source: Economic Research Service, United States Department of Agriculture, Jackson, Mississippi

livestock and livestock products account for 17 percent.

Income from sources other than product marketings contribute about 14 percent toward total gross farm income. In 1970, gross income minus production expenses yielded a farm proprietors' net income of $748,020,000. Derived net income per farm amounted to $5,244.

Agricultural earnings for the region during the period 1950-1968 (table 12) remained relatively constant around one billion dollars. On the other hand, total earnings for the region more than doubled during the same period. As a result, earnings from agriculture declined from 21.5 percent of the region total in 1950 to 10.0 percent in 1968. The relative advance in total earnings in the region and the relative decline in agricultural earnings in the region tend to support the position that other income components, particularly wage and salary income, are increasing in importance. This situation is a result primarily of growing urban centers, expanding consumer markets, increased utilization of services, large government facilities, and industrial expansion.

Table 12 - Total Earnings, Agricultural Earnings, and Agricultural Earnings Related to Lower Mississippi Region and Nation 1/

| | Year | | |
|---|---|---|---|
| | 1950 | 1959 | 1968 |
| Total Earnings in Lower Mississippi Region 2/ | 5,908,523 | 7,919,503 | 12,280,220 |
| Earnings from Agriculture in Lower Mississippi Region 2/ | 1,272,921 | 1,115,692 | 1,232,087 |
| Ratio of Agricultural Earnings to Total Regional Earnings, Percent | 21.5 | 14.1 | 10.0 |
| Ratio of Agricultural Earnings to Total U. S. Agricultural Earnings, Percent | 5.5 | 6.7 | 6.8 |

1/ Working data supplied by the Bureau of Economic Analysis, United States Department of Commerce, Washington, D. C.
2/ Earnings values are given in thousands of 1967 dollars.

However, agricultural earnings in the Lower Mississippi Region, relative to total agricultural earnings for the Nation, increased from 5.5 percent in 1950 to 6.8 percent in 1968.

National food and fiber requirements. The general procedure used in projecting agricultural production was to assess the past performance of agricultural activity, determine the future demand for agricultural products, and estimate the expected productive capacity of the region. The basic data needed in the beginning were national requirements for food, feed, and fiber and the regional allocation of the production.

The projected national requirements for 1980, 2000, and 2020 represent the expected demand under the specified assumptions presented earlier. The national production requirements were adjusted to account for imports and exports. Consequently, the end result is the quantity of agricultural products that must be produced to meet net domestic requirements in the United States and to allow for projected exports.

Expanding national requirements for agricultural production result from three major economic forces, i.e., growth of population, rising per capita consumer income, and the associated changes in tastes which influence trends in per capita use, and foreign demand. The product requirements of the United States, in the aggregate, can be expected to increase largely as a function of an assumed population growth. At higher income levels, consumer response to further income gains is reflected mainly in shifts among individual products with little increase in total overall consumption of farm products per person.

The basis for projecting national product requirements was to project requirements per person for all major crop and livestock products. Estimates of total requirements were derived by multiplying the results of per capita estimates for each commodity by projected population. Historical agricultural and forestry output data for the United States and projected demands for 1980, 2000, and 2020 are presented in table 13.

Lower Mississippi Region food and fiber requirements. Separate forecasts of agricultural production have been developed for Programs A and B (table 14). Program A projections are based upon a direct relationship of the Lower Mississippi Region to national projections, while Program B provides for a rate of growth for agriculture in the Lower Mississippi Region equal to the rate of growth for agriculture throughout the United States. Thus, Program B projections for 2000 and 2020 average 7 percent higher than Program A projections.

Farm income. Projected farm income data are presented in table 15 for both Programs A and B. The farm income components are identical for Programs A and B in 1980, as the projected products requirements

Table 13 - Agricultural and Forestry Output in United States 1/

| Commodity 2/ | Unit of Measurement | Historic Output for Indicated Years 3/ | | | Projected Demand for Indicated Years 3/ | | |
|---|---|---|---|---|---|---|---|
| | | 1949 | 1959 | 1964 | 1980 | 2000 | 2020 |
| Crop Production | | | | | | | |
| Corn and Grain Sorghum | Cwt | 1,634,654 | 2,354,988 | 2,141,355 | 3,985,556 | 4,951,506 | 6,079,959 |
| Oats and Barley | Cwt | 469,788 | 511,494 | 432,496 | 513,456 | 583,483 | 646,721 |
| Wheat | Bushels | 1,006,559 | 1,055,925 | 1,217,791 | 1,514,203 | 1,811,697 | 2,009,501 |
| Rice | Bushels | 89,432 | 120,890 | 166,276 | 223,162 | 257,333 | 306,222 |
| Potatoes | Bushels | 366,336 | 373,371 | 369,576 | 552,833 | 722,333 | 934,333 |
| Sugar | Tons | 16,245 | 23,998 | 37,075 | 40,554 | 56,825 | 76,764 |
| Fruit and Nuts | Cwt | 332,420 | 371,500 | 383,050 | 517,422 | 668,141 | 850,127 |
| Vegetables | Cwt | 297,438 | 345,147 | 374,736 | 540,700 | 702,600 | 911,000 |
| Cotton | Bales | 15,419 | 13,914 | 14,734 | 11,500 | 12,500 | 13,500 |
| Soybeans | Bushels | 212,440 | 515,628 | 669,665 | 1,394,000 | 1,718,000 | 2,014,000 |
| Peanuts | Pounds | 1,721,913 | 1,413,381 | 2,004,021 | 3,980,357 | 5,220,279 | 5,884,194 |
| Livestock Production | | | | | | | |
| Beef and Veal | Cwt | 192,745 | 282,797 | 347,854 | 524,230 | 703,939 | 943,091 |
| Pork | Cwt | 194,575 | 212,729 | 202,047 | 254,007 | 332,626 | 430,680 |
| Lamb and Mutton | Cwt | 12,777 | 17,127 | 13,302 | 10,015 | 11,783 | 14,494 |
| Poultry | Pounds | 4,982,912 | 8,541,808 | 10,509,035 | 19,186,996 | 26,819,907 | 36,041,705 |
| Eggs | Dozens | 4,679,500 | 5,277,917 | 5,418,500 | 6,330,598 | 8,103,648 | 10,264,493 |
| Milk | Cwt | 1,161,030 | 1,219,890 | 1,268,110 | 1,121,200 | 1,383,850 | 1,690,050 |
| Timber Production | | | | | | | |
| All Roundwood | Cubic Feet | 10,160,000 | 10,750,000 | 11,175,000 | 18,500,000 | 28,200,000 | 33,690,000 |
| Sawlogs, Veneer Logs, and Other Industrial Products | Cubic Feet | 6,065,000 | 7,000,000 | 7,135,000 | 11,400,000 | 15,500,000 | 17,500,000 |
| Pulpwood | Cubic Feet | 1,275,000 | 2,330,000 | 2,885,000 | 6,300,000 | 11,900,000 | 15,400,000 |

1/ Source: Economic Activity in The United States by Water Resource Regions and Subareas, Historical and Projected, 1929-2020, Volume 3, United States Water Resource Council, Washington, D. C.
2/ Excludes crop, livestock, and timber production for Alaska and Hawaii.
3/ All values should be multiplied by 1,000.

Table 14 - Production Requirements for Agricultural Commodities in Lower Mississippi Region

| Commodity | Unit of Measurement | Amount Required in Indicated Years 1/ | | | | |
|---|---|---|---|---|---|---|
| | | 1959 | 1970 | 1980 | 2000 | 2020 |
| Cotton | Bales | | | | | |
| Program A 2/ | | -- | 4,317 | 5,491 | 5,969 | 6,445 |
| Program B 2/ | | -- | -- | 5,491 | 6,411 | 6,923 |
| Cottonseed | Tons | | | | | |
| Program A | | -- | 1,869 | 2,350 | 2,585 | 2,791 |
| Program B | | -- | -- | 2,350 | 2,776 | 2,998 |
| Corn | Bushels | | | | | |
| Program A | | -- | 38,851 | 25,023 | 34,588 | 41,372 |
| Program B | | -- | -- | 25,023 | 37,155 | 44,428 |
| Sorghum | Bushels | | | | | |
| Program A | | -- | 974 | 1,855 | 2,382 | 3,303 |
| Program B | | -- | -- | 1,855 | 2,560 | 3,546 |
| Oats | Bushels | | | | | |
| Program A | | -- | 6,627 | 7,331 | 7,571 | 7,850 |
| Program B | | -- | -- | 7,331 | 8,136 | 8,429 |
| Rice | Bushels | | | | | |
| Program A | | -- | 91,495 | 99,717 | 117,590 | 139,930 |
| Program B | | -- | -- | 99,717 | 126,320 | 150,269 |
| Barley | Bushels | | | | | |
| Program A | | -- | 254 | 403 | 514 | 591 |
| Program B | | -- | -- | 403 | 552 | 635 |
| Irish Potatoes | Bushels | | | | | |
| Program A | | -- | 436 | 499 | 649 | 841 |
| Program B | | -- | -- | 499 | 698 | 904 |
| Sweet Potatoes | Bushels | | | | | |
| Program A | | -- | 3,567 | 2,840 | 2,947 | 3,694 |
| Program B | | -- | -- | 2,840 | 3,167 | 3,969 |
| Tobacco | Pounds | | | | | |
| Program A | | -- | 13,522 | 12,388 | 14,284 | 16,139 |
| Program B | | -- | -- | 12,388 | 15,344 | 17,331 |
| Sugarcane | Tons | | | | | |
| Program A | | -- | 8,291 | 9,010 | 10,479 | 11,761 |
| Program B | | -- | -- | 9,010 | 11,258 | 12,630 |
| Wheat | Bushels | | | | | |
| Program A | | -- | 10,889 | 34,978 | 41,851 | 46,420 |
| Program B | | -- | -- | 34,978 | 44,957 | 49,850 |
| Rye | Bushels | | | | | |
| Program A | | -- | 200 | 267 | 282 | 296 |
| Program B | | -- | -- | 267 | 303 | 318 |

1/ All values should be multiplied by 1,000.

2/ Program A data were calculated by incorporating 1970 production estimates. Program B data reflect the projected national growth rate shown in Table II-3, Selected Agricultural Products, pages II-18 through II-22, Volume 1, Economic Activity in the United States by Water Resource Regions and Subareas, Historical and Projected, 1929-2020, United States Water Resources Council, April 1971.

Table 14 - Production Requirements for Agricultural Commodities in Lower Mississippi Region (Con.)

| Commodity | Unit of Measurement | Amount Required in Indicated Years | | | | |
|---|---|---|---|---|---|---|
| | | 1959 | 1970 | 1980 | 2000 | 2020 |
| Peanuts | Pounds | | | | | |
| Program A | | -- | 1,791 | 2,056 | 2,664 | 3,335 |
| Program B | | -- | -- | 2,056 | 2,862 | 3,582 |
| Soybeans | Bushels | | | | | |
| Program A | | -- | 182,109 | 281,956 | 347,666 | 409,374 |
| Program B | | -- | -- | 281,956 | 373,478 | 439,619 |
| Cowpeas | Bushels | | | | | |
| Program A | | -- | 60 | 250 | 278 | 306 |
| Program B | | -- | -- | 250 | 300 | 327 |
| Hay | Tons | | | | | |
| Program A | | -- | 1,438 | 2,025 | 2,498 | 3,081 |
| Program B | | -- | -- | 2,025 | 2,683 | 3,311 |
| Forest Products | Thousands of Cubic Feet | | | | | |
| Program A | | -- | 860 | 1,007 | 1,326 | 1,465 |
| Program B | | -- | -- | 1,150 | 1,622 | 2,091 |
| Gross Value of Crops | 1967 Dollars | | | | | |
| Program A | | -- | 1,771,263 | 2,243,981 | 2,590,274 | 2,932,554 |
| Program B | | -- | -- | 2,243,981 | 2,793,062 | 3,175,916 |
| Beef 3/ | Pounds | | | | | |
| Program A | | -- | 883,504 | 1,125,254 | 1,514,658 | 2,034,153 |
| Program B | | -- | -- | 1,125,254 | 1,627,106 | 2,184,436 |
| Pork 3/ | Pounds | | | | | |
| Program A | | -- | 350,785 | 400,315 | 522,887 | 678,752 |
| Program B | | -- | -- | 400,315 | 561,706 | 728,898 |
| Lamb 3/ | Pounds | | | | | |
| Program A | | -- | 1,475 | 1,132 | 1,331 | 1,638 |
| Program B | | -- | -- | 1,132 | 1,430 | 1,759 |
| Chickens 3/ | Pounds | | | | | |
| Program A | | -- | 268,373 | 374,293 | 522,631 | 701,667 |
| Program B | | -- | -- | 374,293 | 561,431 | 755,506 |
| Turkeys 3/ | Pounds | | | | | |
| Program A | | -- | 3,081 | 4,113 | 5,781 | 7,806 |
| Program B | | -- | -- | 4,113 | 6,210 | 8,383 |
| Eggs | Dozens | | | | | |
| Program A | | -- | 204,558 | 224,736 | 287,678 | 364,390 |
| Program B | | -- | -- | 224,736 | 309,035 | 391,311 |
| Milk | Pounds | | | | | |
| Program A | | -- | 1,364,944 | 1,253,502 | 1,547,144 | 1,889,476 |
| Program B | | -- | -- | 1,253,502 | 1,662,004 | 2,029,070 |
| Gross Value of Livestock | 1967 Dollars | | | | | |
| Program A | | 283,959 | 373,307 | 525,342 | 693,393 | 908,153 |
| Program B | | -- | -- | 525,342 | 744,869 | 975,249 |

3/ Net liveweight production.

Table 15 - Gross Farm Income, Production Expense, and Net Income in Lower Mississippi Region

| Farm Income Components | Value in 1967 Dollars in Indicated Years | | | |
|---|---|---|---|---|
| | 1970 | 1980 | 2000 | 2020 |
| | | Program A | | |
| Marketing Receipts | 2,145,000,000 | 2,770,000,000 | 3,287,000,000 | 3,841,000,000 |
| Nonmoney Income 1/ | 348,400,000 | 454,000,000 | 536,000,000 | 625,000,000 |
| Realized Gross 2/ | 2,493,400,000 | 3,224,000,000 | 3,823,000,000 | 4,466,000,000 |
| Production Expense | 1,745,380,000 | 2,257,000,000 | 2,675,000,000 | 3,126,000,000 |
| Realized Net | 748,020,000 | 967,000,000 | 1,148,000,000 | 1,340,000,000 |
| | | Program B | | |
| Marketing Receipts | -- | 2,770,000,000 | 3,539,000,000 | 4,152,000,000 |
| Nonmoney Income 1/ | -- | 454,000,000 | 575,000,000 | 675,000,000 |
| Realized Gross 2/ | -- | 3,224,000,000 | 4,114,000,000 | 4,827,000,000 |
| Production Expense | -- | 2,257,000,000 | 2,879,000,000 | 3,379,000,000 |
| Realized Net | -- | 967,000,000 | 1,235,000,000 | 1,448,000,000 |

1/ Includes value of home consumption of farm products, value of farm dwellings, and government transfer payments.
2/ Excludes changes in inventories.

are the same. In 2000 and 2020, projected production requirements for agricultural commodities are greater for Program B than for Program A. The Program A estimates show an increase in net income from $748 million in 1970 to $1.3 billion in 2020, or an increase of 79 percent. The Program B estimates show an increase in net income to $1.4 billion in 2020.

Agricultural earnings. Projected agricultural earnings are presented in table 16. Agricultural earnings comprised 10 percent of total region earnings in 1968, but they are projected to fall to 5.3 percent in 1980, 3.0 percent in 2000, and 2.4 percent in 2020. Region agricultural earnings as a share of U. S. agricultural earnings are projected at 5.2 percent in 1980, 2000, and 2020.

Agricultural employment. Employment shifts in the economy of the Lower Mississippi Region and the United States have been influenced historically by decreasing demands for labor in agriculture. Massive adjustments in the agricultural sector have been precipitated by an expansion in the size of farms, mechanization of agricultural jobs, and dramatic gains in agricultural productivity. These adjustments have freed a large portion of the agricultural labor force for employment in other occupations.

Over the past three decades, the growth in output per man-hour in agriculture has been rapid—at a rate approaching 4.5 percent per year. This growth has been achieved with approximately the same crop acreage but with a large increase in the amount of farm machinery and equipment per man. Further, declining labor requirements have been accompanied by higher expenditures for variable capital inputs, e.g., fertilizer, seed, insect and disease control, and weed eradication.

Table 16 - Projected Total Earnings, Agricultural Earnings, and Agricultural Earnings Related to Lower Mississippi Region and Nation

| | Year | | |
|---|---|---|---|
| | 1980 | 2000 | 2020 |
| Total Earnings in Lower Mississippi Region 1/ | | | |
| Program A | 19,003,000 | 42,028,000 | 93,758,000 |
| Program B | 20,834,000 | 48,607,000 | 110,581,000 |
| Earnings from Agriculture in Lower Mississippi Region 1/ | | | |
| Program A | 1,011,000 | 1,281,000 | 2,236,000 |
| Program B | 1,109,000 | 1,481,000 | 2,638,000 |
| Ratio of Agricultural Earnings to Total Regional Earnings, Percent | | | |
| Program A | 5.3 | 3.0 | 2.4 |
| Program B | 5.3 | 3.0 | 2.4 |
| Ratio of Agricultural Earnings to Total U. S. Agricultural Earnings, Percent | | | |
| Program A | 5.2 | 5.2 | 5.2 |
| Program B | 2/ | 2/ | 2/ |

1/ Earnings values are given in thousands of 1967 dollars.
2/ No alternative set of U. S. earnings.

Agricultural employment for the region includes employment in agricultural production, agricultural services, hunting and trapping, forestry, and fisheries. Historical and projected agricultural employment levels for the region are presented in table 17 for Programs A and B. Levels of agricultural employment in the Lower Mississippi Region and the United States reflect rapidly rising output per man-hour. Agricultural employment is projected to decline in all future time frames, since productivity in the agricultural sector will more closely approach that achieved in the nonfarm sector of the economy. With expanded real output rates, a smaller agricultural force will be able to satisfy food and fiber requirements of a growing population.

Table 17 - Agricultural Employment in Lower Mississippi Region

| Year | Number of Persons Employed | |
|---|---|---|
| | Program A | Program B |
| 1950 | 569,900 | -- |
| 1960 | 296,079 | -- |
| 1980 | 135,000 | 137,000 |
| 2000 | 103,000 | 112,000 |
| 2020 | 101,000 | 110,000 |

Agricultural industrial specialization. The Lower Mississippi Region's projected agricultural indexes of relative regional specialization for 1980, 1990, 2000, 2010, and 2020 are presented in table 18. As previously referred to in the description of the present agricultural economy, when regional earnings in agriculture (expressed as a percentage of total regional earnings) exceed the corresponding national percentage, agriculture is considered to be producing more than is needed for consumption in the region. At this point, the region is

Table 18 - Agricultural Industrial Specialization Index for Lower Mississippi Region

| | Year | | | | |
|---|---|---|---|---|---|
| | 1980 | 1990 | 2000 | 2010 | 2020 |
| Industrial Specialization Index for Lower Mississippi Region, Percent | 5.321 | 3.924 | 3.047 | 2.646 | 2.385 |
| Industrial Specialization Index for United States, Percent | 2.206 | 1.619 | 1.258 | 1.099 | 0.995 |
| Difference Between Lower Mississippi Region Index and U. S. Index, Percent | 3.115 | 2.305 | 1.789 | 1.547 | 1.390 |

considered to be an exporter of agricultural products. Projected agricultural indexes for selected future time frames for the Lower Mississippi Region reveal that the degree of overall specialization is declining. This logically results from the fact that the smaller the value, the lesser the portion of total earnings associated with export production and, therefore, the lesser the degree of basin overall specialization. The Lower Mississippi Region index was 12.605 in 1950 and is projected to decline to 1.39 in 2020.

Rural-urban population. There are several characteristics of population other than total size that exert important influences upon the shape and movement of the Lower Mississippi Region's economy. One is the extent of urbanization. Urbanization has become almost synonymous with economic growth.

For purposes of this study, total population was stratified into only two categories--urban and rural. During the period 1950-1970, only WRPA's 3 and 10 had an urban population exceeding rural population. Urban population exceeded rural population in WRPA's 8 and 9 beginning in the year 1960.

The population of the region has developed from one of about 43 percent urban in 1950 to one of about 57 percent in 1970 (see table 19). More people are moving to the cities, and rural inhabitants are adopting urbanized modes of living. Thus, with the trend of accelerated growth in the urbanized WRPA's and the attendant population

Table 19 - Total, Urban, and Rural Population, Lower Mississippi Region, Indicated Years 1/

| Year | Program A | | | Program B | | |
|---|---|---|---|---|---|---|
| | Total | Urban | Rural | Total | Urban | Rural |
| 1950 | 5,545,348 | 2,379,723 | 3,165,625 | NA | NA | NA |
| 1960 | 5,826,287 | 3,065,726 | 2,760,561 | NA | NA | NA |
| 1970 | 6,302,000 | 3,734,123 | 2,567,930 | NA | NA | NA |
| 1980 | 6,741,000 | 4,281,135 | 2,459,564 | 7,285,000 | 4,662,400 | 2,622,600 |
| 2000 | 8,156,161 | 5,738,513 | 2,417,648 | 9,188,000 | 6,431,600 | 2,756,400 |
| 2020 | 10,196,000 | 7,744,465 | 2,451,331 | 11,655,000 | 8,857,800 | 2,797,200 |

1/ Source: Tables 5 and 6.

contraction in the more rural WRPA's, future growth in the region is encouraging.

Urban population in the Lower Mississippi Region increased from 2,379,723 in 1950 to 3,734,123 in 1970. Continuing urbanization in the region should raise urban population to 7,744,465 in 2020 (Program A). In that year, approximately 76 percent of the region's total population will reside in urban areas and only 24 percent will reside in rural areas. Program B population projections are similar since it was assumed that the urban-rural relationship would remain the same in the projected years as for Program A.

Summary. The importance of agriculture in the economy of the Lower Mississippi Region may be characterized in several ways. In 1970, agricultural land accounted for 61.3 million acres, or 91 percent of the total area of the basin. Thus, the agriculture industry utilizes a major proportion of the region's land and water resources for the production of a variety of crops and livestock products.

There has been a dramatic decline in the number of farms in the region; however, it is anticipated that the rate of decline will subside in future years. The average size of farms reveals a steady increase over time, and this trend is expected to continue into the future. While most region farms were relatively small in 1970, the number of farms in larger size groups is expected to increase to better accommodate the adoption of modern farming methods in order to reduce total costs and increase net returns. Although there are currently many more farms in the smaller size groups, the farms in the larger size groups comprise a larger percentage of the total farmland base and produce the larger share of crops and livestock.

Total crop and livestock output is projected to increase steadily in future years. This will result even with a decline in agricultural employment. The massive adjustments in the agricultural sector of the region have been precipitated by an expansion in farm size, mechanization of agricultural jobs, and gains in agricultural productivity. Thus, by the substitution of capital for human labor, a large portion of the agricultural labor force has been freed for employment in other occupations. Even with the smaller labor force, the agriculture industry can continue to satisfy food and fiber requirements for growing regional and national populations and for an expanding market in foreign countries. Although future exports will depend upon changing international trade policies of the various nations, future U. S. production estimates beyond 1980 assume that agricultural exports will continue to increase but at a decreasing rate.

Within the framework of the requirements for water and water-related land resources established by the needs of a diverse economy, the physical factors that affect land use become increasingly important.

These factors largely determine the limits of the productivity of available water and water-related land resources, as well as the costs either of intensifying uses or of bringing new lands into production.

The economic trends as presented in this report are coordinated with agricultural physical and economic factors that are presented in other appendixes of the regional study. It is recognized that the overall trend in land utilization, agricultural output, farm income and earnings, and rural or farm population are affected by physical, economic, and social conditions.

Forests in the Region's Economy

Forests and forest products have always been important in the development of the Lower Mississippi Region. Their contribution to the nation's timber economy is also significant. Increasing national and world demand for wood ensures that the region's production will be limited only by the economically available supply of timber. The future levels of timber harvested are based on the assumption that forest land owners, both public and private, will continue to increase their investment in forestry. Projected industrial wood consumption based on timber harvested will be realized only if logging and industrial technology are further developed to provide at least a 50 percent better utilization rate. As supplies and tastes change, so will changing national demands alter the forest product mix; e.g., the paper and allied products industry may replace lumber as the dominant consumer of wood fiber before the turn of the century (table 20).

Table 20 - Amount of Commercial Forest Land in Indicated Years
Thousands of Acres, by WRPA's

| WRPA | 1949 | 1954 | 1959 | 1964 | 1970 |
|---|---|---|---|---|---|
| 2 | 4,198 | 3,999 | 3,800 | 3,274 | 2,746 |
| 3 | 2,047 | 2,095 | 2,132 | 2,132 | 2,145 |
| 4 | 3,839 | 3,833 | 3,761 | 3,590 | 3,448 |
| 5 | 10,335 | 10,698 | 11,043 | 10,955 | 10,792 |
| 6 | 2,309 | 2,255 | 2,136 | 1,888 | 1,493 |
| 7 | 2,047 | 2,191 | 2,285 | 2,303 | 2,302 |
| 8 | 2,420 | 2,405 | 2,374 | 2,341 | 2,313 |
| 9 | 3,306 | 3,257 | 3,254 | 3,251 | 3,284 |
| 10 | 1,192 | 1,159 | 1,116 | 1,074 | 1,055 |
| Total | 31,696 | 31,896 | 31,906 | 30,812 | 29,580 1/ |

1/ Total commercial forest land within the hydrologic boundaries of the Lower Mississippi Region is 29,637,000 acres as specified in Appendix F, Land Resources.

The timber resource. Forests occupy 29,580,900 acres, or nearly half of the total land area in the Lower Mississippi Region. Of this acreage, all but 45,000 acres is classified as commercial forest land, which supports over 27 billion cu ft of growing stock. Of the 29.6 million acres of commercial forest land, almost 2.5 million acres are in national forests and other public ownerships. The remaining 27 million acres are in private ownerships—farm, forest industry, and miscellaneous private holdings.

Major forest types in the region are longleaf-slash pine, loblolly-shortleaf pine, oak-pine, oak-hickory, oak-gum cypress, and elm-ash-cottonwood. The oak-gum cypress type, located in the Mississippi River delta and along the major and minor tributaries within the region is the most plentiful single type, comprising 30 percent of the commercially forested acres. The next most plentiful type is oak-hickory followed closely by loblolly-shortleaf pine and oak-pine (table 21).

Table 21 - Major Forest Types of Commercial Forest Land by WRPA's in Lower Mississippi Region in 1970

| | Amount of Commercial Forest Land Occupied by Indicated Tree Type thousands of acres | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| WRPA | All Types | Longleaf-Slash | Loblolly-Shortleaf | Oak-Pine | Oak-Hickory | Oak-Gum Cypress | Elm-Ash-Cottonwood | Other Types 1/ |
| 2 | 2,746.9 | -- | 59.6 | 149.1 | 1,070.9 | 980.7 | 195.2 | 291.4 |
| 3 | 2,145.0 | -- | 161.2 | 115.1 | 1,012.2 | 509.2 | 229.9 | 117.4 |
| 4 | 3,448.2 | -- | 480.0 | 411.2 | 1,328.8 | 970.5 | 257.7 | -- |
| 5 | 10,792.1 | 164.9 | 3,870.6 | 2,162.4 | 2,100.9 | 2,345.3 | 148.0 | -- |
| 6 | 1,493.1 | -- | 29.0 | 51.1 | 55.2 | 1,187.7 | 170.1 | -- |
| 7 | 2,302.9 | 5.4 | 686.7 | 418.1 | 733.9 | 396.1 | 62.7 | -- |
| 8 | 2,313.7 | 75.6 | 630.0 | 280.4 | 318.1 | 886.6 | 123.0 | -- |
| 9 | 3,284.0 | 806.5 | 591.0 | 400.2 | 223.1 | 1,022.1 | 241.1 | -- |
| 10 | 1,055.0 | 118.0 | 96.9 | 22.8 | 39.9 | 688.7 | 88.7 | -- |
| Total | 29,580.9 | 1,170.4 | 6,605.0 | 4,010.4 | 6,883.0 | 8,986.9 | 1,516.4 | 408.8 |

1/ Includes white oak, central mixed hardwoods, maple-beech-birch, post-blackjack oak, cedar, and hardwood and cedar.

A slight increase in forest acreage for the region was evidenced over the 10-year period 1949-1959. Since then, there has been a steady decline, which has continued to the point that forest land now occupies less than half of the present land area.

The rate of loss of forest land acreage for the region (7 percent since 1949) has not occurred consistently in each WRPA. WRPA's 3, 5, and 7 have actually experienced an increase in forest acreage.

The most dramatic and publicized loss of forest acreage has taken place in the Southern Mississippi Valley Alluvium Land Resource Area (LRA), commonly called "the delta." This LRA embraces and makes up the largest part of WRPA's 2, 4, and 6. In 1949, 9.5 million acres were in forest. Since then, over 2.4 million acres have been cleared and converted to other uses; in other words, one out of every four forested acres has been cleared over the past 20 years.

All but 8 percent of the forested land is privately owned. Of these private lands, 30 percent is in farms, 23 percent in industrial properties, and the remaining 47 percent in miscellaneous private holdings. Six national forests account for 5 percent of the 8 percent of commercial forest land not privately owned, and the remaining 3 percent is in other public ownerships such as wildlife refuges, game management areas, and State forests (table 22).

The Lower Mississippi Region forests contain an estimated net sawtimber volume of 90 million bd ft. Private ownerships account for 76 percent of the sawtimber volume, with forest industries owning about 21 percent of that. The remaining 24 percent is in public ownership, 18 percent of which is in national forests.

Growing stock and sawtimber volumes on commercial forest land by species groups are given in table 23.

Over 860 million cu ft of industrial roundwood was harvested in the region in 1970. Over half of this was softwood (largely pine). All together, 760 million cu ft were processed by the region's forest industry. Some 200 million cu ft were shipped to surrounding States, and 100 million cu ft were brought into the region.

Industrial wood products accounted for over 82 percent of the harvest; 300 million cu ft of pulpwood, 560 million cu ft of sawtimber and veneer logs, and miscellaneous wood products were removed. Saw logs were the leading product, and pulpwood was second place in terms of volume of wood processed. Miscellaneous products such as poles, piling, posts, and cooperage accounted for about 13 percent of the harvest. Veneer logs, mainly softwood, ranked fourth and comprised nearly 5 percent of the total. Timber products outputs by item and species for WRPA's 2-10 in 1970 are given in table 24.

Table 22 - Ownership of Commercial Forests, Lower Mississippi Region, Thousands of Acres, 1970

| WRPA | Total Acreage | Public | | Private | | |
|---|---|---|---|---|---|---|
| | | National Forest | Other Public | Farm | Forest Industry | Miscellaneous Private |
| 2 | 2,746.9 | 244.8 | 204.8 | 1,148.0 | 129.2 | 1,020.1 |
| 3 | 2,145.0 | 7.8 | 105.2 | 1,010.0 | 95.2 | 926.8 |
| 4 | 3,448.2 | 196.0 | 195.7 | 1,615.0 | 403.6 | 1,037.9 |
| 5 | 10,792.1 | 763.2 | 165.4 | 1,635.9 | 3,830.0 | 4,397.6 |
| 6 | 1,493.1 | -- | 41.0 | 326.0 | 489.7 | 636.4 |
| 7 | 2,302.9 | 150.4 | 60.6 | 912.0 | 343.1 | 836.8 |
| 8 | 2,313.7 | 34.9 | 32.0 | 536.6 | 465.0 | 1,245.2 |
| 9 | 3,284.0 | 84.0 | 101.8 | 544.0 | 358.3 | 2,195.9 |
| 10 | 1,055.0 | -- | 17.0 | 193.8 | 11.5 | 832.7 |
| Total | 29,580.9 | 1,481.1 | 923.5 | 7,921.3 | 6,125.6 | 13,129.4 |

Table 23 - Growing Stock and Sawtimber, Lower Mississippi Region

| WRPA | Growing Stock, $10^6$ cu ft | | | Sawtimber, $10^6$ bd ft | | |
|---|---|---|---|---|---|---|
| | All Species | Softwood | Hardwood | All Species | Softwood | Hardwood |
| 2 | 2,234.9 | 174.2 | 2,060.7 | 6,683.1 | 636.2 | 6,046.9 |
| 3 | 1,636.2 | 137.7 | 1,498.5 | 4,511.2 | 454.3 | 4,056.9 |
| 4 | 2,404.4 | 499.3 | 1,905.1 | 6,710.0 | 1,507.8 | 5,202.2 |
| 5 | 10,790.9 | 6,067.7 | 4,723.2 | 37,966.5 | 26,187.1 | 11,779.4 |
| 6 | 1,366.9 | 101.8 | 1,265.1 | 3,982.2 | 478.3 | 3,503.9 |
| 7 | 2,158.0 | 1,212.9 | 945.1 | 7,793.2 | 5,369.3 | 2,423.9 |
| 8 | 2,598.6 | 1,192.2 | 1,406.4 | 9,370.0 | 5,453.5 | 3,916.5 |
| 9 | 2,325.1 | 1,208.5 | 1,116.6 | 8,702.6 | 5,694.5 | 3,008.1 |
| 10 | 1,431.1 | 689.8 | 741.3 | 5,326.6 | 3,444.6 | 1,882.0 |
| Total | 26,946.1 | 11,284.1 | 15,662.0 | 91,045.4 | 49,225.6 | 41,819.8 |

Table 24 - Timber Products Output in 1970

| WRPA | Wood Type | Output of Roundwood Products, $10^3$ cu ft: Saw Logs, Veneer Logs, and Miscellaneous Timber Products 1/ | Pulpwood | Total |
|---|---|---|---|---|
| 2 | Softwood | 1,235 | 293 | 1,528 |
| | Hardwood | 38,387 | 3,252 | 41,639 |
| | Total | 39,622 | 3,545 | 43,167 |
| 3 | Softwood | 1,763 | 3,600 | 5,363 |
| | Hardwood | 30,695 | 709 | 31,404 |
| | Total | 32,458 | 4,309 | 36,767 |
| 4 | Softwood | 8,473 | 11,148 | 19,621 |
| | Hardwood | 37,234 | 15,557 | 52,791 |
| | Total | 45,707 | 26,705 | 72,412 |
| 5 | Softwood | 166,775 | 105,984 | 272,759 |
| | Hardwood | 75,320 | 44,491 | 119,811 |
| | Total | 242,095 | 150,475 | 392,570 |
| 6 | Softwood | 7,388 | 2,707 | 10,095 |
| | Hardwood | 32,991 | 10,736 | 43,727 |
| | Total | 40,379 | 13,443 | 53,822 |
| 7 | Softwood | 21,029 | 23,986 | 45,015 |
| | Hardwood | 16,179 | 15,928 | 32,107 |
| | Total | 37,208 | 39,914 | 77,122 |
| 8 | Softwood | 26,409 | 20,049 | 46,458 |
| | Hardwood | 43,629 | 9,498 | 53,127 |
| | Total | 70,038 | 29,547 | 99,585 |
| 9 | Softwood | 28,700 | 25,802 | 54,502 |
| | Hardwood | 9,800 | 4,572 | 14,372 |
| | Total | 38,500 | 30,374 | 68,874 |
| 10 | Softwood | 5,200 | 3,935 | 9,135 |
| | Hardwood | 6,700 | 178 | 6,878 |
| | Total | 11,900 | 4,113 | 16,013 |
| Total | Softwood | 266,972 | 197,504 | 464,476 |
| Total | Hardwood | 290,935 | 104,921 | 395,856 |
| | Grand Total | 557,907 | 302,425 | 860,332 |

1/ Miscellaneous timber products include cooperage, piling, poles, posts, fuelwood, etc.

Lumber is the region's major forest product. Almost half of the roundwood output from the region in 1970 was saw logs. Softwoods comprised almost half of the total saw log volume of 378 million cu ft. Though some cypress and cedar logs were produced, pine made up nearly all of the softwood volume. Almost two-thirds of the pine saw log volume came from WRPA 5, the southern Arkansas - northern Louisiana area. This area is the leading producer of wood and wood products in the region, with almost a billion bd ft of saw logs and veneer logs and 150 million cu ft of pulpwood produced in 1970.

Lumber production rose during the period 1962-1966, reversing a trend evident during the 50's. Lumber output is expected to continue upward in the immediate future, but little change is anticipated in numbers of mills.

In the Arkansas portion of the region, however, the number of sawmills has been slowly dwindling since 1946 despite a projected increase in production. There are now 560 sawmills in the region, which in 1970 produced 378 million cu ft of sawtimber.

Since 1962, lumber production has increased by 26 percent. Large sawmills processed about 80 percent of the logs sawn in the region in 1970. Of the 430 million cu ft of sawlogs harvested, 88 percent were processed within the region. The balance, 52 million cu ft, was shipped outside the region primarily to Alabama, Arkansas, Louisiana, Tennessee, and Texas.

Pulpwood. Round pulpwood production in 1970 totaled over 302 million cu ft, an increase of 30 percent since 1960. Hardwood production accounted for much of this increase. The region's pulping capacity has practically doubled in the last 12 years. In 1958, the region's eight mills had a capacity of 4,000 tons per day. By the end of 1970, 15 mills with a capacity of over 8,000 tons per day were operating.

Roughly 100 million cu ft of coarse residues were generated in 1970 during the conversion of roundwood into products. In addition, 65 million cu ft of fine residues were produced at primary manufacturing plants excluding pulp mills. The volume of unused residue is gradually decreasing as more and more wood-using mills install chippers to convert their coarse residues to a form acceptable to pulp mills. Also, the pulp industry has begun using sawdust in the manufacture of some products. Tree length chipping installations are another important innovation that will probably influence the pulpwood supply pattern in the future. The heavy use of residues for pulp in the region is partially explained by the high proportion of saw and veneer logs processed by large plants. The combined receipts of large pine plywood plants and sawmills in the region approached 50 percent of the total roundwood output. Nearly all of these large firms make some use of their coarse residues.

Veneer. Since the inception of the southern pine plywood industry in the region in the early 1960's, the production of southern pine plywood has grown into an industry consuming almost 10 percent of the softwood cut. As an example of the change in the character of this industry in the region, in 1956 not one Mississippi pine log was used by the veneer industry; in 1958 all the veneer produced in Arkansas was hardwood; and in 1970 almost 60 percent of the veneer produced in Arkansas was softwood. There were 39 veneer plants in the region producing well over 42 million cu ft in 1970.

Miscellaneous products. Between 1960 and 1970, output of miscellaneous products rose about 10 percent. About 40 percent of the miscellaneous volume went into poles, piling, and posts. Pole and piling output has risen about 10 percent since 1960, but post production has declined slightly. The rest of the miscellaneous output, mostly hardwood, included such products as chemical wood, cooperage, handle stock, and excelsior. Excelsior was the primary softwood product in the class. Chemical wood, cooperage, and handle stock accounted for 80 percent of the hardwood miscellaneous products.

The future forest economy. The forest economy of the Lower Mississippi Region has been projected in terms of wood consumption, employment, and payrolls for the 1972-2020 period. The current enlargement of pulping capacity and the emergence of the southern pine plywood industry are indications of the industrial expansion that is possible if the region's forests are effectively managed. Recent productivity gains are encouraging. At present, the region is realizing only half of its timber growing potential.

Future demand for wood products. National trends in quantities of wood products which will be demanded have been projected. These projections are based on at least five major factors: population household formation, GNP, disposable personal income, and construction activity.

Timber products output from domestic roundwood by WRPA's for 1970, along with projected requirements for 1980, 2000, and 2020 for the region, is given in table 25.

Total demand for lumber in the United States shows a moderate rise between 1962 and 1985. Plywood and veneer demands are predicted to double, with the South, especially the Lower Mississippi Region, expected to supply an increasing share of the future market. Total wood products needs per capita should continue to increase so that the total demand will continue to rise throughout the projection period at historic rates.

Roundwood consumption by saw logs. In 1970, sawmills, veneer and plywood plants, and miscellaneous timber products producers consumed 558 million cu ft of roundwood. By 2020, the demand in the region is

Table 25 - Timber Products Output and Projected Needs from Domestic Roundwood

| WRPA | Roundwood Products Output, $10^6$ cu ft | | | | | |
|---|---|---|---|---|---|---|
| | Saw Logs, Veneer Logs, and Miscellaneous Timber Products 1/ | Pulpwood | Total | Saw Logs, Veneer Logs, and Miscellaneous Timber Products 1/ | Pulpwood | Total |
| | 1970 | | | 1980 | | |
| 2 | 40 | 3 | 43 | 82 | 3 | 85 |
| 3 | 33 | 4 | 37 | 57 | 8 | 65 |
| 4 | 46 | 26 | 72 | 81 | 25 | 106 |
| 5 | 242 | 151 | 393 | 427 | 379 | 806 |
| 6 | 40 | 14 | 54 | 51 | 28 | 79 |
| 7 | 37 | 40 | 77 | 54 | 48 | 102 |
| 8 | 70 | 30 | 100 | 81 | 46 | 127 |
| 9 | 38 | 30 | 68 | 49 | 28 | 77 |
| 10 | 12 | 4 | 16 | 18 | 5 | 23 |
| Total | 558 | 302 | 860 | 900 | 570 | 1,470 |
| | 2000 | | | 2020 | | |
| 2 | 99 | 5 | 104 | 117 | 6 | 123 |
| 3 | 70 | 15 | 85 | 84 | 19 | 103 |
| 4 | 97 | 51 | 148 | 115 | 65 | 180 |
| 5 | 525 | 758 | 1,283 | 632 | 965 | 1,597 |
| 6 | 63 | 56 | 119 | 75 | 71 | 146 |
| 7 | 66 | 97 | 163 | 79 | 123 | 202 |
| 8 | 99 | 92 | 191 | 119 | 117 | 236 |
| 9 | 59 | 56 | 115 | 69 | 71 | 140 |
| 10 | 22 | 10 | 32 | 25 | 13 | 38 |
| Total | 1,100 | 1,140 | 2,240 | 1,315 | 1,450 | 2,765 |

1/ Miscellaneous timber products include cooperage, piling, poles, posts, fuelwood, etc.

projected to increase to 1,300 million cu ft. This rate of increase exceeds that of the projected increase in national demand.

Although lumber output is expected to continue upward in the immediate future, little change is anticipated in the number of mills, with the exception of additional plywood and particle board facilities that are planned for the region in the near future. Presently, 526 sawmills, 46 wood-preserving plants, 39 veneer plants, and 124 miscellaneous plants are operating within the Lower Mississippi Region.

In 1970, an estimated 302 million cu ft of pulpwood was consumed by pulpmills in the region. It was estimated that over 40 percent of this total wood fiber consumption was residue from the lumber and wood products industry. It is projected that by 2020, the total wood demand by the pulp paper and allied products industry will increase to 1,500 million cu ft, a fivefold expansion in demand. As the available supply of plant residues becomes fully utilized, an increasing part of pulpwood production will come from roundwood sources. Almost every

planning area is expected to share in the expansion of this industry, but WRPA 5 will remain the most important pulpwood producing area in the region, with almost 1 billion cu ft projected to be produced there in 2020.

Agricultural industrial specialization. The Lower Mississippi Region's projected agricultural index of relative regional specialization for the projected years is presented in table 18. The data show that the degree of overall specialization is declining. This logically results from the fact that the smaller the value, the lesser the portion of total earnings associated with export production. The Lower Mississippi Region index for forestry and fisheries was 0.258 in 1950 and is projected to decline to 0.071 by 2020; the lumber and furniture index is projected to decline from 1.8 in 1950 to 0.997 in 2020, and the paper and allied products index will increase from 0.3 in 1950 to 0.6 in 2020.

Summary. Timber growing opportunities are certainly as favorable in the Lower Mississippi Region as in any other region in the United States. Most woodlands are readily accessible, local markets are plentiful, and an excellent road and river system links these markets with the forest resource. Productivity of forest lands is generally among the highest in the United States. Some of the best timber sites in the United States are found here. Comparative advantages imply that higher returns per unit of labor and capital investments are obtainable from forestry in the Lower Mississippi Region.

The delta has long been noted for the quality and quantity of timber yielded by its forests. These forests are generally regarded as the most productive hardwood forests of any size in the entire South and perhaps the Nation. The decade by decade attrition of hardwood acreage in the delta has caused widespread local concern over the long-range future of the region's wood processing industry.

It seems inevitable that the region's timber resource will become increasingly important in meeting growing national demands. Recent industrial expansion, most notedly in the pulp and plywood industries, is only a preview of the activities that can be stimulated by wisely managed forest resources.

Trends appear to be continuing. Softwood sawtimber growth presently exceeds the cut, while hardwood is being used faster than it is growing. Utilization of sawmill residues from pulp chips has risen sharply in the last decade. The sale of chips has helped the region's mills offset the rising costs of lumber production.

While the changes in forest acreage are partly compensatory, timber growth nevertheless suffers from the shift from bottomland to upland. The forests that are converted usually contain mature trees,

representing many years of growth. Land reverting to forests is unproductive for some time if regeneration is delayed or inadequate.

The region is presently realizing only half of its timber growing potential. Most of the 29.5 million acres of commercial forest land offers opportunity to increase growth. About 4.1 million acres, or 13 percent, are at least 70 percent stocked with desirable timber, i.e., thrifty trees that presently are potentially capable of yielding high-quality saw logs or other forest products. A third of the forest area, or 10.3 million acres, is between 40 to 70 percent stocked with desirable trees. About one-third of this area is expected to reach full stocking without treatment. Slightly over half of the area, or 15.1 million acres, is less than 40 percent stocked with desirable trees. Many of these stands will require special efforts for restoration to full production.

Mining

Detailed information concerning mining in the Lower Mississippi Region is presented in Appendix G, "Related Mineral Resources." This section presents a summary of data for the region as well as projections for the mineral industry through 2020.

Value of mineral production in current dollars in the Lower Mississippi Region amounted to $4.75 billion in 1969, up from $1.29 billion in 1956. This value represented about 18 percent of the Nation's $26.9 billion in mineral output in 1969, up from 7 percent of the Nation's $17.3 billion output in 1956.

The economic importance of the mineral industry to the region is obvious. Less evident is the importance to the Nation of regional output of certain minerals. In 1969, the Lower Mississippi Region accounted for a substantial part of the Nation's liquid and gaseous fuels—specifically, 34 percent of the natural gas output, 31 percent of the natural gas liquids, and 25 percent of the petroleum. Twenty percent of the Nation's lead was produced in the northern part of the region. The region also produced one-fifth of the Nation's bromine, one-third of its salt, and two-thirds of its sulfur.

Based upon reserve data, developing mineral projects, and ongoing exploration efforts, increased output of all minerals produced in the Lower Mississippi Region is virtually ensured through 1980. Beyond 1980, however, there will be resource problems. Natural gas (and associated natural gas liquids) supplies could dwindle, and output of lead from the in-region part of the southeast Missouri lead belt may be constrained, too. Quality problems are faced by some nonmetallic mineral producers, especially producers of construction minerals near the Gulf Coast.

Production and value data for minerals in the Lower Mississippi

Region during the 1956-1969 period were used to develop regional mineral output trends, considering 1969 as the base year. Projections of mineral fuel output in the region were based primarily upon national projections, with due consideration given to the region's favorable crude oil potential and possible natural gas limitation. Projections of metallic mineral production were based upon reserve and resource estimates and the judgment of those familiar with the general mining districts and specific mining operations. Projections of nonmetallic mineral production were based upon market opportunities—local markets for construction minerals, and regional or national markets for the other minerals.

Mineral fuels. Crude oil reserves in the region were approximately 6 billion barrels at the end of 1969, or about 20 percent of the Nation's total 30-billion-barrel reserve. Natural gas reserves were even more impressive, i.e., about 90 trillion cu ft, or about one-third of the Nation's 275-trillion-cu-ft reserve. To help put these reserve figures into meaningful perspective, it may be recalled that in the late 1960's, total annual national outputs of oil and gas were about 3.3 billion barrels and 20 trillion cu ft, respectively. The oil and gas resource potential in the region seems quite promising. Recent production trends, exploration activity, and reserve data favor growth in output both onshore and offshore in the southernmost part of the region. Geologic conditions are promising in the Desha Basin in the east-central part of the region where the sedimentary rock column approaches 20,000 ft in thickness.

Widespread but discontinuous deposits of lignite are scattered throughout much of the region. Although there were no lignite operations in the region in the late 1960's, it is noteworthy that in recent years similar lignite deposits in east Texas have been developed for use in electric power generation and for limited use in the chemical industry. It seems quite probable that some of the lignite resources in the region will be developed through 2020, but because of limited resource and related information, it is impossible even to approximate the location of probable developments.

Metals. Metallic mineral resources have been developed and produced in important quantities in southeast Missouri and central Arkansas. Although reserve data are limited and are frequently held confidential, the near-term future seems certain to be marked by some growth in output.

Base metals (lead, zinc, and copper) and iron ore are produced in southeast Missouri. By-products include silver and periodically some minor amounts of nickel and cobalt. Vanadium is produced in Garland County, Ark. The vanadium ore is associated with alkali igneous rocks and is a unique mineral deposit in this respect in the Nation. Geologic conditions do not favor metallic mineral deposits in the eastern

and southern portions of the Lower Mississippi Region.

Nonmetals. Many of the more common construction minerals—sand, gravel, stone, gypsum, and clay—are found in the region. There is a paucity of reserve data. In general, however, the resource base of most of the important construction minerals is huge.

Several other important nonmetallic minerals are produced in the region, including important quantities of barite, bromine, salt, and sulfur. Barite is used mostly in the preparation of drilling mud for the petroleum industry. Bromine mainly is used in petroleum refining as ethylene dibromide, a gasoline motor fuel additive. It is also widely used in the chemical industry.

Projections. As stated earlier, resource problems will plague mineral production after 1980. Natural gas (and associated natural gas liquids) is probably the best example. If substantial gas discoveries are made offshore, at greater depths in Louisiana, and in WRPA's 2, 3, and 4, then projected output through 2020 is quite possible. These discovery assumptions, however, are quite demanding, and the possibility of a troublesome natural gas resource base after 2000 must be weighed. Crude oil output in some of the older producing districts, such as southwest Arkansas, possibly may decline somewhat more than anticipated, too.

Although there are quality problems in the nonmetallic minerals resource base in some parts of the region, there are no serious resource base problems in view. In essence, the mineral resource base is generally believed to be capable of supporting most projected mineral output through 2020. A parallel assumption is that access to land and suitable incentives will spur mineral industry exploration and development efforts in the region.

Value of mineral production by commodity group in 1969 and projections for 1980, 2000, and 2020 are listed in table 26. Program A and Program B projections in terms of 1967 dollars are included for mineral fuels, metallic minerals, and nonmetallic minerals.

Value of mineral fuels output is expected to increase about 100 to 260 percent through 2020. Value of metallic minerals may rise about 75 to 130 percent, while that for nonmetallic minerals could soar 230 to 385 percent. Much of the sharp increase in nonmetallic mineral output is attributable to the expected marked upturn in salt and sulfur production in the coastal area through 2020. Projections of individual mineral commodities are given in detail in Appendix G, "Related Mineral Resources." Total mineral output in the region is projected to increase from 105 percent (Program A) to 270 percent (Program B) through 2020.

Table 26 - Mineral Production in 1969 and Projections for Specified Years, Lower Mississippi Region 1/

| Commodity | Thousands of 1967 Dollars | | | |
|---|---|---|---|---|
| | 1969 | 1980 | 2000 | 2020 |
| Mineral Fuels | | | | |
| Program A | 4,243,140 | 5,175,200 | 6,791,500 | 8,435,600 |
| Program B | 4,243,140 | 6,816,400 | 11,028,000 | 15,356,800 |
| Metallic Minerals | | | | |
| Program A | 51,400 | 90,300 | 90,700 | 90,700 |
| Program B | 51,400 | 101,100 | 114,600 | 117,700 |
| Nonmetallic Minerals | | | | |
| Program A | 309,017 | 438,200 | 720,800 | 1,018,300 |
| Program B | 309,017 | 539,300 | 1,006,000 | 1,502,000 |
| Total, All Minerals | | | | |
| Program A | 4,603,557 | 5,704,000 | 7,603,000 | 9,545,000 |
| Program B | 4,603,557 | 7,457,000 | 12,149,000 | 16,976,000 |

1/ Source: U. S. Bureau of Mines.

Values of mineral production are listed in table 27. A and B projections in terms of 1967 dollars are included for nine WRPA's. Mineral production for WRPA 1, the land between the levees of the Mississippi River, is credited to the nearest county or parish and is included in appropriate WRPA's. (Minerals involved mostly would be sand, gravel, and clays from the riverbed and subsurface oil and gas.)

If the mineral resource base proves sufficient, WRPA 10 could have as much as a 350 percent increase in value of mineral production through 2020. Value of mineral output could rise about 260 percent in WRPA 8 through 2020. Both of these estimates are highly dependent upon the probable sharp increase in salt and sulfur production and the somewhat hopeful assumption that oil and gas resources exist and can be economically recovered. Projections of the individual mineral components of these WRPA's are presented in detail in Appendix G, "Related Mineral Resources." Value of mineral production in all other WRPA's should increase moderately from 110 percent (Program A) to 165 percent (Program B) through 2020.

Electric Power

General. The market area for hydroelectric power from projects in the Lower Mississippi Region is primarily Power Supply Areas (PSA) 25, 29, 33, 34, and 35, as designated in Appendix R, "Power."

Table 27 - Mineral Production and Projections by WRPA for Specified Years

| WRPA | Production Extremes | Thousands of 1967 Dollars 1969 | 1980 | 2000 | 2020 |
|---|---|---|---|---|---|
| 2 | Program A | 57,257 | 95,900 | 97,300 | 99,000 |
| | Program B | 57,257 | 106,100 | 119,100 | 121,500 |
| 3 | Program A | W 1/ | 10,200 | 18,700 | 28,800 |
| | Program B | W | 10,600 | 19,400 | 29,800 |
| 4 | Program A | 14,719 | 16,600 | 21,100 | 26,600 |
| | Program B | 14,719 | 18,500 | 26,300 | 34,900 |
| 5 | Program A | W | 229,100 | 261,300 | 295,400 |
| | Program B | W | 263,400 | 339,900 | 420,700 |
| 6 | Program A | 64,947 | 66,200 | 83,700 | 101,800 |
| | Program B | 64,947 | 76,900 | 109,300 | 142,100 |
| 7 | Program A | 46,362 | 56,500 | 74,400 | 91,400 |
| | Program B | 46,362 | 61,700 | 88,000 | 113,200 |
| 8 | Program A | 125,657 | 166,600 | 257,600 | 354,100 |
| | Program B | 125,657 | 185,100 | 313,500 | 449,800 |
| 9 | Program A | 1,532,272 | 1,966,700 | 2,745,600 | 3,525,500 |
| | Program B | 1,532,272 | 2,102,100 | 3,103,800 | 4,069,600 |
| 10 | Program A | 2,564,283 | 3,095,700 | 4,043,400 | 5,021,900 |
| | Program B | 2,564,283 | 4,632,200 | 8,029,400 | 11,594,800 |
| Lower Mississippi Region | Program A | 4,603,557 | 5,704,000 | 7,603,000 | 9,545,000 |
| | Program B | 4,603,557 | 7,457,000 | 12,149,000 | 16,976,000 |

1/ W—Withheld to avoid disclosing company confidential information.

Power needs and projected growth. The population of the market area (PSA's 25, 29, 33, 34, and 35) was 14,672,000 in 1966, and, based on Bureau of Census projections, should increase to 20,197,000 by 1990. Except for electrical energy trends, population is the principal guide used in the electric load growth forecast.

The compound annual rate of growth for the peak demand in the market area for the period 1955-1965 was 10.9 percent. The compound rate

of growth is projected to gradually decrease to 7.9 percent between 1980 and 1990. The coincident peak demands for the market area in 1965 and 1966 were 14,326 Mw and 16,038 Mw, respectively. The coincident peak is expected to reach 53,370 Mw in 1980 and 113,898 Mw in 1990.

The energy requirements in 1965 and 1966 were 69,166 million kWh and 76,202 million kWh, respectively. The projected energy requirements are estimated to be 257,950 million kWh in 1980 and 568,525 million kWh in 1990. Air conditioning, winter heating loads, and electric utility promotional programs affect annual load factors and cause variations in rates of growth.

Nonfarm residential energy usage per customer for the market area averaged 4,855 kWh per customer in 1966 and is predicted to reach approximately 12,000 kWh per customer in 1990. Commercial energy use per customer during the same period is expected to increase from 26,656 kWh to about 99,000 kWh per customer. Industrial energy use is by far the largest category of classified sales and in 1966 represented 29,597 million kWh energy requirement and is predicted to reach 238,631 million kWh in 1990, or 46.5 percent of the total area requirements.

Conclusions. Theoretically, for study purposes the projected peak loads for 1980 and 1990 (53,370 and 113,898 Mw, respectively) will exceed the presently known available and planned capacity in the area. Projections of presently known capacity estimated to be available by 1980 and 1990 are 47,529 and 40,860 Mw, respectively (includes retirements). Applying these amounts to the projected peak loads plus 15 percent for reserve requirements would indicate theoretical deficits of 13,846 and 90,123 Mw for 1980 and 1990, respectively. An analysis of load duration curves for the market area in 1980 and 1990 shows that all of the available hydroelectric capacity, potential conventional and pumped storage, as well as seasonal diversity capacity can be utilized to meet the loads. (See Appendix R, "Power" for details.)

Specifically, by 1980, 2,784 and 3,741 Mw of existing and proposed conventional hydroelectric and pumped storage, respectively, could be utilized. Likewise, by 1990 the conventional and pumped storage capacities could total 3,975 and 7,726 Mw, respectively.

Exclusive of hydroelectric generation, loads by 1980 and 1990 will be met by thermal power plants, both fossil and nuclear fueled. While present thermal generation in the market area is approximately 95 percent from natural gas and 5 percent from coal, by 1990 it is expected the mix will be about 46 percent natural gas, 43 percent nuclear, and 10 percent coal.

Manufacturing

Manufacturing is relatively less important in the Lower Mississippi Region than it is in the Nation as a whole, but is increasing in

importance. In 1968, the manufacturing earnings of $2,551 million (1967 dollars) comprised only 20.7 percent of total earnings in the Lower Mississippi Region; for the Nation, manufacturing comprised 29.4 percent of total earnings. However, over the past two decades the percentage in the Lower Mississippi Region has risen from 16.5 percent. Also, between 1950 and 1968 manufacturing earnings in the Lower Mississippi Region increased from 1.3 to 1.6 percent of the national total.

The importance of the individual manufacturing industries may be expressed in three different ways. One way frequently used is to rank the industries in terms of their importance in the region relative to their importance nationally. The ratio which expresses this relationship is called the location quotient and is calculated by dividing the percent distribution in the region by the national percent distribution. Only six of the manufacturing industries in the Lower Mississippi Region in 1968 had location quotients greater than 1.0; i.e., were more important in the region's economy than in the national economy. These six industries account for about 56 percent of total manufacturing earnings in the region (table 28).

Table 28 - Earnings Location Quotient and Percent of Total Manufacturing Earnings, Specified Industries, 1968

| Industry | Percent of Total Manufacturing | Location Quotient |
|---|---|---|
| Petroleum Refining | 6.0 | 2.7 |
| Lumber and Furniture | 11.9 | 1.9 |
| Paper and Allied Products | 7.6 | 1.5 |
| Chemicals | 11.6 | 1.3 |
| Food and Kindred Products | 12.7 | 1.1 |
| Apparel | 6.6 | 1.1 |

In the Lower Mississippi Region, miscellaneous manufacturing and fabricated metals are not relatively important; i.e., location quotients are less than 1.0. However, they both contribute more to total manufacturing earnings than paper, apparel, or petroleum refining. This combination of characteristics is possible because fabricated metals and miscellaneous manufacturing are more important nationally than are the other three industries.

A third basis of importance ranking is in accordance with an industry's contribution to export activity. This ranking is determined by components of the Index of Relative Regional Specialization (IRRS).

Each area exports the commodities or services of certain industries, the proceeds from which are used to purchase the specialized commodities or services of other areas. Some areas specialize greatly, while others are more nearly self-sufficient in all industries.

For this report, the degree of industrial specialization has been based on industrial earnings as the measure of economic activity. The IRRS is calculated by first subtracting the national industrial percent distribution from the regional industrial percent distribution. When this is done, the positive and negative values will add to zero. The IRRS is defined as the sum of the positive values; the larger the sum, the greater the degree of specialization. The sum represents that portion of the area's total earnings that is associated with export activity. This is also true of each industry's contribution to the IRRS.

Manufacturing activity is unevenly distributed among the WRPA's. In 1968, the Memphis area (WRPA 3) accounted for 28 percent of total manufacturing in the Lower Mississippi Region, the Ouachita area (WRPA 5) for 13 percent, the New Orleans area (WRPA 10) for 22 percent, and the Baton Rouge area (WRPA 8) for 10 percent. Manufacturing activity accounted for by other areas varied from 1 percent in WRPA 6 to 8 percent in WRPA 4.

Major water-using industries. Detailed information regarding industrial water requirements is presented in Appendix K, "Municipal and Industrial Water Supply." The six heavy water-using manufacturing industries are pulp and paper, petroleum refining, chemicals, food and kindred products, primary metals, and textiles. Four of these, as discussed below, are especially important in the Lower Mississippi Region, and all will require increased supplies of water in the manufacturing process.

Petroleum refining. In 1968, the petroleum industry accounted for 6 percent of total manufacturing earnings in the region. In terms of relative importance, the industry had an earnings location quotient of 2.7, which was higher than that for any other industry. This means that this segment of manufacturing was 2.7 times more important to the region's economy than it was to the national economy.

Close proximity to the vast offshore oil supply in the Gulf of Mexico has made Louisiana WRPA's 8, 9, and 10 leaders in the region. There are 14 active refineries in these WRPA's, with WRPA 8 boasting the largest refinery on the North American Continent.

In 1968, WRPA 9 accounted for 36 percent of the region's earnings in petroleum refining, with the majority occurring in the Lake Charles area. Next in order of importance were WRPA 8 with 25 percent and WRPA 10 with 19 percent.

Earnings for the region are expected to increase from 6 percent of the United States total in 1968 to 7 percent in 2020. As in the past, WRPA's 8, 9, and 10 will account for most of these earnings, with respective percentages of the region's total of 20, 41, and 18 percent. WRPA 5, accounting for 14 percent of the region's total, follows in order of importance.

Paper and allied products. These products are classified under Standard Industrial Classification (SIC) 26 which includes establishments engaged in the manufacture of pulps from wood, other cellulose fibers, and rags; the manufacture of paper and paperboard; and the manufacture of paper and paperboard into converted products such as paper coated off the paper machine, paper bags, paper boxes, and envelopes.

It has been said that a Nation's standard of living can be quite accurately judged by the amount of paper it consumes. The United States uses over 530 pounds of paper and paperboard a year for each of its more than 200 million inhabitants. Europeans use about one-fourth as much. In Asia and the Near East, the annual paper consumption stands at less than 3 lb per person.

Approximately 97 percent of this country's paper comes from wood; consequently, pulp and paper mills are usually located near a large supply of timber. Another basic requirement of this industry is a huge supply of water, which dictates a location near a river.

Formerly, only certain types of trees could be used for making paper, but with present technology almost any tree species can be used. Moreover, parts of trees once left in the forest and wood scraps once burned as waste are now utilized in the paper making process.

In order to keep abreast of the continuing demand for paper, a vigorous tree farming practice has been implemented that will ensure an adequate supply of the raw material. Included in the tree farming practice are the development of superior tree species, culling of undesirable trees, and systematic replanting.

The Lower Mississippi Region in its original state was a natural woodland. This attribute, in addition to the abundance of streams and rivers, has contributed to the establishment of a strong pulp and paper industry. Typical of the numerous modern pulp plants in the area that feature the latest in technology is the $80 million Westvaco Corporation plant recently established at Wickliffe, Ky. The aerial photograph on the following page shows this plant and its proximity to the Mississippi River.

In manufacturing in 1968 in the Lower Mississippi Region, paper and allied products ranked third in earnings, being surpassed by food and kindred products and chemical and allied products in that order.



Westvaco Corporation pulp plant at Wickliffe, Ky

In 1950 and 1959, the Lower Mississippi Region had earnings in paper and allied products that represented 3 percent of total United States earnings in this classification. By 1968, earnings had increased to 4 percent, and are projected to remain at 4 percent through 2020 under both Programs A and B.

Earnings for both Programs A and B and for the United States are shown in figure 5 on a semilogarithmic scale which facilitates comparison of growth rates since equal rates of gain have parallel slopes.

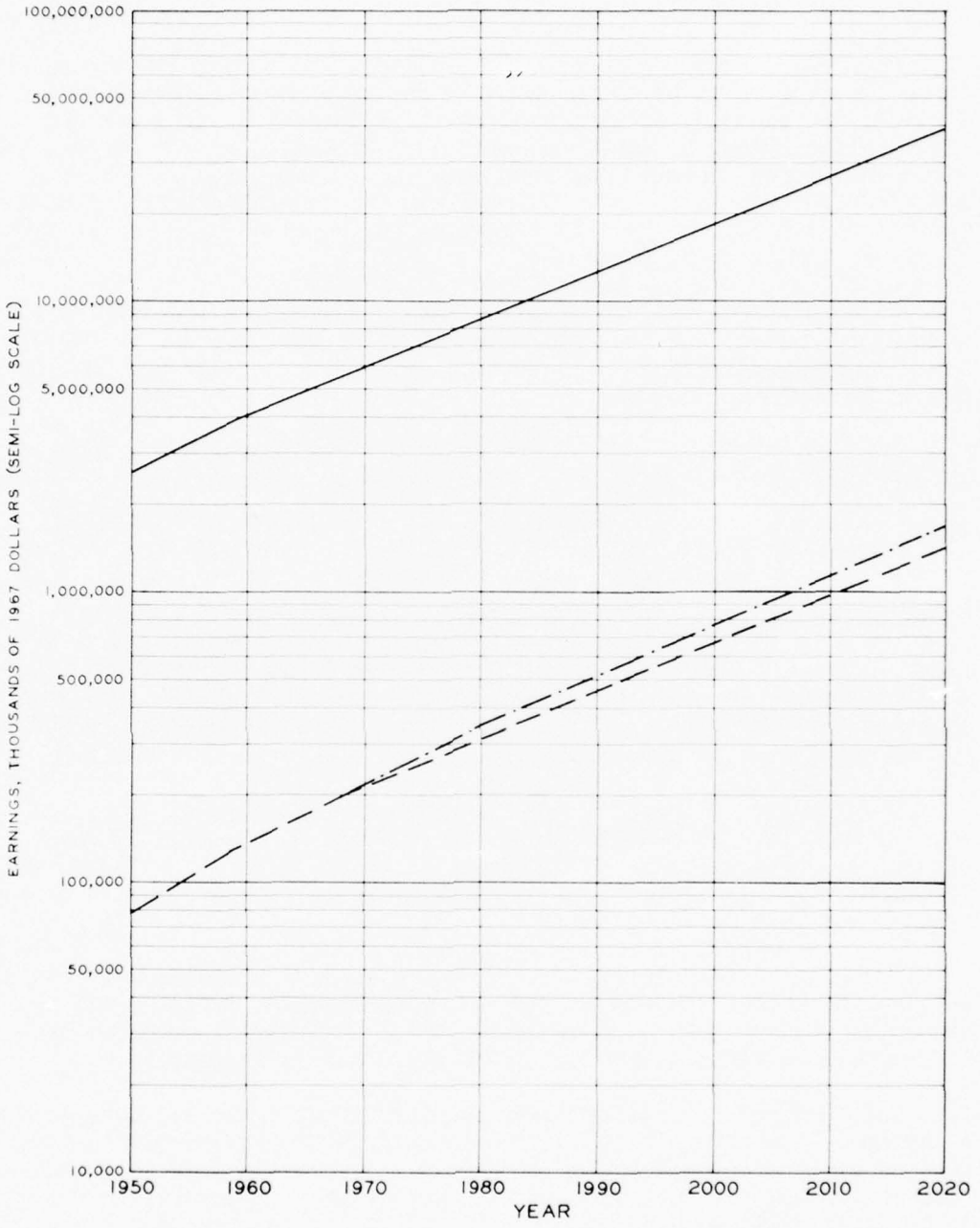
As concerns the future growth of this industry in the Lower Mississippi Region, pulp and paper are firmly established in the United States as one of the leading industries. Paper is being utilized for jobs for which formerly only wood, glass, leather, and cotton were used. The increasing popularity of throwaway articles has been one factor that has contributed to the demand. With an increasing affluency in the United States and a resulting expanding use of articles and their packaging in paper and paper cartons, and with a continued utilization of present uses of paper and new developments concerning additional areas, it seems certain that pulp and paper manufacturing will continue to fulfill its role as one of the primary industries.

Chemicals. In 1968, the chemical industry accounted for approximately 12 percent of total manufacturing earnings in the Lower Mississippi Region. Most of these chemical earnings (71 percent) were realized in Louisiana WRPA's 8, 9, and 10. This development of the chemical industry in Louisiana can be traced to a number of factors: (1) a great abundance of petroleum and natural gas; (2) an available supply of basic chemical raw materials such as sulfur, salt, and limestone; (3) plenty of water for cooling and processing; and (4) availability of transportation facilities of all types for national and international movement of raw materials and finished products.

Most of the chemicals produced in Louisiana are classified as basic chemicals, i.e., acids, alkalies, salts, or organic chemicals. Plastic materials and synthetics, carbon black, and agricultural chemicals are other groupings of great importance.

The only WRPA outside Louisiana with a significant share of the region's chemical earnings is WRPA 3 (14 percent). Major chemical products manufactured include industrial chemicals and soaps and cleaners. Pharmaceutical preparations for support of the vast Memphis Medical Complex are also of importance.

Total chemical earnings for the region are expected to increase from 3 percent of the United States total in 1968 to 4 percent in 2020. Following historical trends, most of these earnings are expected to be realized in WRPA's 3, 8, 9, and 10, with respective percentages of 17, 43, 11, and 20.




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LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

HISTORICAL AND PROJECTED
PAPER AND ALLIED PRODUCTS
INDUSTRY EARNINGS IN
LOWER MISSISSIPPI REGION
AND UNITED STATES



FIGURE 5

Food and kindred products. The food and kindred products industry is an important part of the economy in the Lower Mississippi Region. In 1968, for example, it accounted for 13.5 percent of regional GPO from manufacturing, as shown in table 29. Projected growth in this and other industries, however, is such that the contribution of the food and kindred products industry to regional GPO from manufacturing will decline to 4.8 percent by 2020. Most of the decrease will result from losses in WRPA's 2, 3, 9, and 10.

In WRPA 10 in 1968, the food and kindred products industry accounted for almost one-fourth of manufacturing GPO, highest in the Lower Mississippi Region. The smallest contribution, 5.1 percent, occurred in WRPA 6.

In 1968, WRPA's 3 and 10 were responsible for over 60 percent of regional GPO from the food and kindred products industry. Other areas obviously contributed substantially less. WRPA 6 accounted for the least with only 0.5 percent (table 30).

The food and kindred products industry is the major manufacturing industry in the region relative to total manufacturing earnings. In 1968, it accounted for approximately 12.5 percent of the regional total. Although continued growth is anticipated in the industry, the projected rate of growth is below that for other industries. By 2020, food and kindred product earnings will decline to 4.5 percent of regional manufacturing earnings.

The industry is particularly significant in WRPA's 2, 3, 9, and 10. In WRPA 10, for example, earnings from the manufacture of food and kindred products represented 18.9 percent of the area's total manufacturing earnings in 1968. This compares with 4.7 percent, lowest in the region, for WRPA 6.

The contribution to regional food and kindred products earnings varies substantially among the WRPA's. For example, WRPA's 3 and 10 accounted for about 60 percent of the total in 1968, as compared with 0.5 and 1.3 percent contributed by WRPA's 6 and 7, respectively.

The food and kindred products industry is also the region's major employment industry. In 1960, it accounted for approximately 16.4 percent of regional manufacturing employment. Projected growth is such that the industry's contribution to manufacturing employment in the region will decline to 5.4 percent in 2020. The greatest decreases will occur in WRPA's 2, 3, 9, and 10.

As was true for the other economic parameters, employment in the food and kindred products industry varies substantially by WRPA. In 1968, over 60 percent of the regional employment for the industry was

Table 29 - Percentage of Manufacturing Gross Product Originating, Earnings, and Employment Attributable to the Food and Kindred Products Industry for Each WRPA and the Lower Mississippi Region in Indicated Years

| Area | Gross Product Originating | | Earnings | | Employment | |
|---|---|---|---|---|---|---|
| | 1968 | 2020 | 1968 | 2020 | 1960 | 2020 |
| Lower Mississippi Region | 13.5 | 4.8 | 12.5 | 4.5 | 16.4 | 5.4 |
| WRPA: 2 | 12.2 | 3.3 | 11.6 | 3.5 | 14.8 | 3.8 |
| 3 | 13.4 | 4.5 | 13.1 | 4.8 | 15.8 | 5.3 |
| 4 | 9.3 | 3.9 | 8.4 | 3.7 | 13.7 | 4.8 |
| 5 | 6.7 | 2.4 | 6.0 | 2.3 | 7.9 | 2.7 |
| 6 | 5.1 | 2.0 | 4.7 | 1.9 | 7.6 | 2.1 |
| 7 | 5.7 | 2.9 | 5.2 | 2.8 | 7.6 | 3.3 |
| 8 | 7.3 | 2.8 | 8.6 | 3.9 | 11.0 | 4.4 |
| 9 | 15.9 | 5.4 | 17.9 | 6.6 | 20.2 | 7.6 |
| 10 | 23.4 | 9.2 | 18.9 | 6.1 | 28.8 | 8.8 |

Table 30 - Percentage Contribution of Each WRPA to Regional Gross Product Originating, Earnings, and Employment for the Food and Kindred Products Industry in Indicated Years

| WRPA | Gross Product Originating | | Earnings | | Employment | |
|---|---|---|---|---|---|---|
| | 1968 | 2020 | 1968 | 2020 | 1960 | 2020 |
| 2 | 6.9 | 6.1 | 6.9 | 6.6 | 8.7 | 6.0 |
| 3 | 28.9 | 30.0 | 29.0 | 32.1 | 23.8 | 30.2 |
| 4 | 5.4 | 7.6 | 5.4 | 8.0 | 6.8 | 9.1 |
| 5 | 6.5 | 5.8 | 6.5 | 6.2 | 7.9 | 6.3 |
| 6 | 0.5 | 0.5 | 0.5 | 0.6 | 0.9 | 0.6 |
| 7 | 1.3 | 1.9 | 1.3 | 2.0 | 1.6 | 2.0 |
| 8 | 6.9 | 8.0 | 6.9 | 8.6 | 5.6 | 7.4 |
| 9 | 10.4 | 8.5 | 10.4 | 9.0 | 10.9 | 8.8 |
| 10 | 31.7 | 30.8 | 33.0 | 27.1 | 34.6 | 30.2 |

in two areas, WRPA's 3 and 10, as compared with less than 1 percent in WRPA 6.

Primary metals. Although the primary metals industry contributes substantially to some local economies, it represents a relatively small segment of the economy in the Lower Mississippi Region. In 1968, it accounted for less than 3 percent of the region's manufacturing earnings, employment, and GPO (see table 31). By 2020, this is projected to decline to 1.5 percent or less.

Table 31 - Percentage of Manufacturing Gross Product Originating, Earnings, and Employment Attributable to the Primary Metals Industry for Each WRPA and the Lower Mississippi Region in Indicated Years

| Area | Gross Product Originating | | Earnings | | Employment | |
|---|---|---|---|---|---|---|
| | 1968 | 2020 | 1968 | 2020 | 1960 | 2020 |
| Lower Mississippi Region | 2.6 | 1.2 | 2.9 | 1.5 | 2.2 | 1.5 |
| WRPA: 2 | 2.4 | 1.3 | 2.7 | 1.7 | 0.7 | 1.6 |
| 3 | 1.7 | 0.9 | 2.0 | 1.2 | 1.5 | 1.1 |
| 4 | 1.2 | 0.5 | 1.3 | 0.6 | 0.3 | 0.7 |
| 5 | 5.3 | 2.4 | 5.7 | 2.8 | 3.2 | 3.6 |
| 6 | NA 1/ | NA | NA | NA | 0.1 | NA |
| 7 | NA | NA | NA | NA | 0.3 | NA |
| 8 | 1.6 | 0.8 | 2.2 | 1.3 | 2.1 | 1.4 |
| 9 | NA | NA | NA | NA | NA | NA |
| 10 | 5.3 | 2.2 | 4.9 | 2.2 | 4.9 | 2.3 |

1/ NA—Not applicable because primary metals industry is relatively insignificant in these areas.

In 1968, the greatest contribution by the primary metals industry to the manufacturing segment of an area's economy occurred in WRPA 5. In this area, it accounted for 5.3, 5.7, and 3.2 percent of GPO, manufacturing earnings, and employment, respectively. However, the relative importance of WRPA 5's primary metals industry will decline substantially by 2020.

The industry's influence in WRPA 10 approached that existing in WRPA 5. This is in sharp contrast to the situation in WRPA's 6, 7, and 9, where the primary metals industry is relatively insignificant.

As indicated in the discussion above, the primary metals industry

is a relatively small part of the regional economy. Also, it is limited to certain areas. This is indicated by the fact that three areas, WRPA's 3, 5, and 10, account for 80 to 85 percent of primary metals industry earnings, employment, and GPO in the region (see table 32). These three areas will retain their overall dominant position through 2020, although the influence of WRPA 3 will increase and that of WRPA 10 will decrease.

Table 32 - Percentage Contribution of Each WRPA to Regional Gross Product Originating, Earnings, and Employment for the Primary Metals Industry in Indicated Years

| WRPA | Gross Product Originating | | Earnings | | Employment | |
|---|---|---|---|---|---|---|
| | 1968 | 2020 | 1968 | 2020 | 1960 | 2020 |
| 2 | 6.9 | 9.7 | 7.0 | 9.7 | 3.0 | 9.2 |
| 3 | 18.6 | 25.2 | 18.7 | 25.2 | 16.8 | 23.3 |
| 4 | 3.6 | 3.8 | 3.6 | 3.7 | 1.1 | 4.4 |
| 5 | 26.5 | 23.0 | 26.2 | 23.1 | 24.1 | 30.0 |
| 6 | NA 1/ | NA | NA | NA | NA | NA |
| 7 | NA | NA | NA | NA | 0.4 | NA |
| 8 | 7.5 | 8.8 | 7.5 | 8.8 | 8.3 | 8.3 |
| 9 | NA | NA | NA | NA | NA | NA |
| 10 | 36.7 | 29.9 | 36.7 | 29.9 | 44.9 | 28.3 |

1/ NA—Not applicable because primary metals industry is relatively insignificant in these areas.

Textiles. Textile mill products are classified under SIC 22, which includes establishments engaged in performing any of the following operations: (1) preparation of fiber and subsequent manufacturing of yarn, thread, braids, twine, and cordage; (2) manufacturing broad woven fabric, narrow woven fabric, knit fabric, and carpets and rugs from yarn; (3) dyeing and finishing fiber, yarn, fabric, and knit apparel; (4) coating, waterproofing, or otherwise treating fabric; (5) the integrated manufacture of knit apparel and other finished articles from yarn; and (6) the manufacture of felt goods, lace goods, bonded-fiber fabrics, and miscellaneous textiles.

In the Lower Mississippi Region, this industry is limited primarily to plants that receive the textiles manufactured mainly in the Carolinas and Georgia; after receipt, finishing is accomplished. Finishing usually consists of various processes, such as dyeing, waterproofing, imprinting of designs, and making permanently pressed fabrics. In addition to the finishing plants, there are several comparatively small plants that are engaged in some type of textile

manufacture. However, in general the main textile manufacturing industries are located outside this region.

In manufacturing in 1968 in the Lower Mississippi Region, textile mill products ranked lowest in earnings of the six heavy water-using industries. In 1950, 1959, and 1968, the Lower Mississippi Region had earnings in textile mill products that represented only 1 percent of total United States earnings in this classification. By 2020, under both Programs A and B, the national share of textile mill products earnings in this region is projected to increase to 2 percent.

Earnings for both Programs A and B and for the United States are shown in figure 6 on a semilogarithmic scale, which facilitates comparison of growth rates since equal rates of gain have parallel slopes.

As concerns future growth, the projections prepared by the Bureau of Economic Analysis, United States Department of Commerce, indicate that the Lower Mississippi Region will double its share of total United States production from 1968 to 2020. More revealing is that earnings from textile mill products will increase from $49,121,000 (in 1967 dollars) in 1968 to $409,000,000 (in 1967 dollars) in 2020. This is an increase of more than 700 percent, compared to a population increase under Program B of approximately 100 percent (from 6,293,977 to 11,655,000).

Recreation

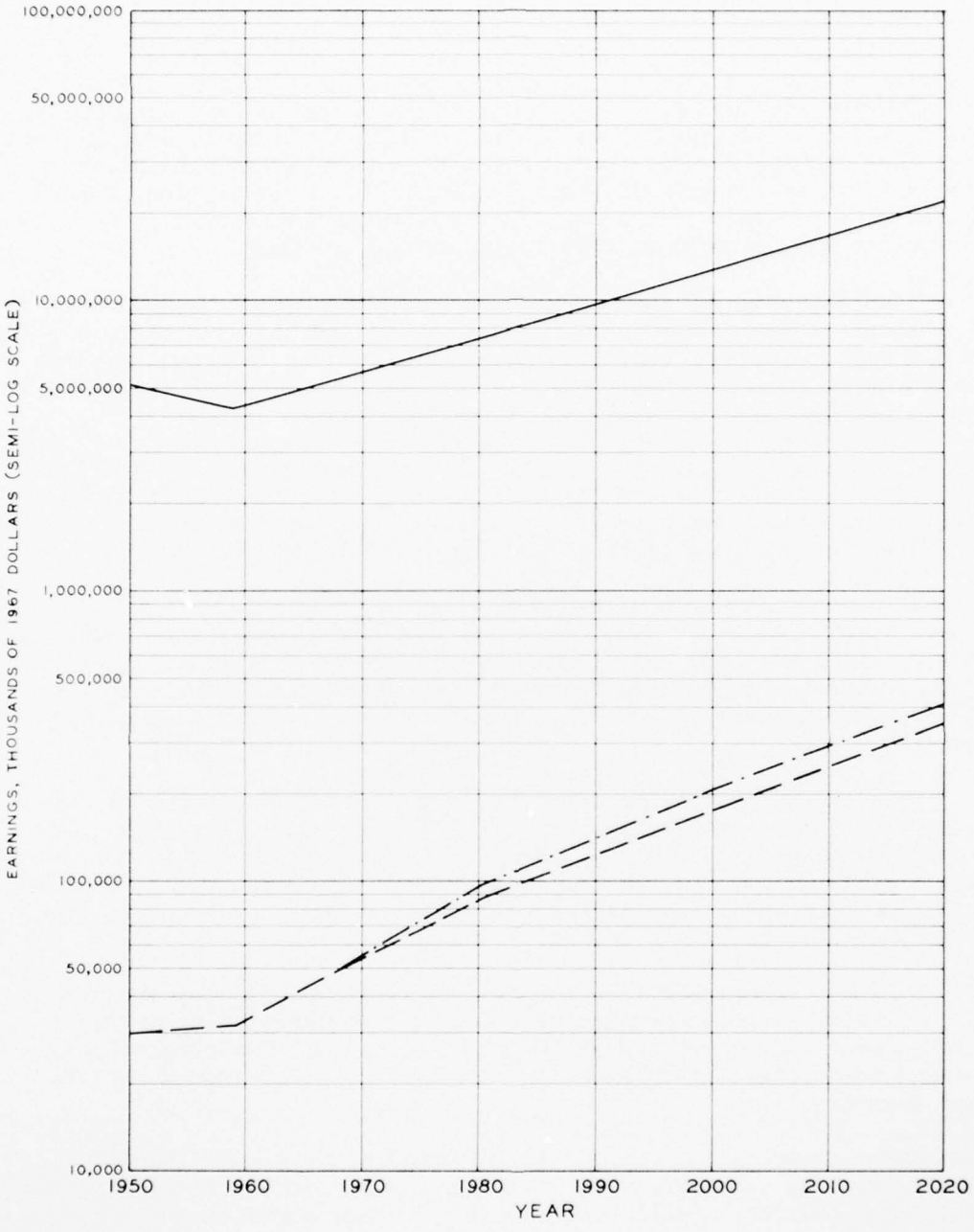
Detailed descriptions of the recreation industry in the Lower Mississippi Region are presented in Appendix N, "Recreation," and in Appendix Q, "Fish and Wildlife." A brief summary is presented in the paragraphs below. 1/

Recreation is presently a major industry in virtually all areas of the country. Total recreation expenditures in 1966 were over $28 billion. This is a 10 percent yearly increase from 1950 to 1966. While this trend may level out some time in the far distant future, the present trend should continue and perhaps increase into the next century.

A report by the Outdoor Recreation Resources Review Commission published in 1962 listed 1960 leisure time related expenditures at $40 billion, outdoor recreation expenditures at $20 billion, and expenditures for vacations, trips, and outings at $10 billion, or 3 percent of consumption expenditures by persons over 12 years old.

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1/ A detailed section, "Economic Impact of Outdoor Recreation," by the Bureau of Outdoor Recreation, can be obtained from the Mississippi River Commission, Vicksburg, Miss.




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LOWER MISSISSIPPI REGION
*COMPREHENSIVE STUDY*

HISTORICAL AND PROJECTED TEXTILE MILL PRODUCTS INDUSTRY EARNINGS IN LOWER MISSISSIPPI REGION AND UNITED STATES

FIGURE 6

As income increases, there is an increased participation in those activities with the greatest economic impact, especially from a capital expenditures standpoint. These include things such as swimming pools, boats, vacation cottages, dune buggies, etc. For example, expenditures for "wheel goods, durable toys, sports equipment, boats, and pleasure aircraft" increased from $0.9 billion in 1950 to $3.4 billion in 1966 (17 percent per year increase). This is a jump from 8 percent of total recreation expenditures in 1950 to 12 percent in 1966.

Vacations have by far the greatest economic impact, accounting for 69 percent of all expenditures, 60 percent of the distance traveled, and 44 percent of the time away from home. In 1960, the average vacation lasted about 10 days, covered over 1,200 person miles, and cost from $8 to $15 per person day. Vacations take place most often during the summer, and to a lesser extent in the fall. As income increases the rate of vacations increases. Thus, families with incomes exceeding $15,000 per year vacationed one and one-half times the average summer rate, and two to three times the average rate for the rest of the year. Distance traveled also increases with income, age, and degree of urbanization.

It is significant that the percentage of people incurring expenses varies greatly with family income. The following comparisons are made between the lowest ($1,500-) and highest ($15,000+) groups: lodging 16-62 percent, food 35-73 percent, outdoor recreation (fees, etc.) 12-55 percent, other recreation 6-30 percent, and miscellaneous 23-48 percent.

Trips account for 13 percent of expenditures, 25 percent of distance traveled, and 42 percent of the time spent away from home. The average trip covers 225 miles, takes 2-1/2 days, and costs $5 per person day. About one-half of all trips (in terms of dollars, miles, and days) occur in the summer. Families with incomes of over $15,000 take comparatively more trips in the winter and spring.

Outings account for 17 percent of expenditures, 25 percent of distance traveled, and 42 percent of time. The average outing is about 8 hours long, and covers about 50 passenger miles. The proportion of participants incurring expenses is closely related to income for all type expenses.

Major purposes for outings in the south (June-August 1960) included swimming (26 percent); picnicking (24 percent); fishing (21 percent); and boating, sightseeing, playing outdoor games, and sports (4 percent).

In comparing families with incomes of over $15,000 with families with incomes of less than $1,500, the wealthier families spent 24 times as much money, traveled nine times as far, and stayed away from home four times as long. Both groups engage in one-third of their activity

in the summer and the other two-thirds throughout the year. Intermediate groups, on the other hand, participate primarily during the summer.

Tourist expenditures go into three sectors: (1) into services such as hotels and entertainment, (2) into the trade sector through the purchase of goods, and (3) to some extent into land and buildings in the form of capital investment. Within each sector, the effect on the economy differs. The most direct employment effect is felt in the service industries insofar as the services are locally provided. These are the labor-intensive recreation establishments, such as motels, restaurants, entertainment, and sports events. It is important to realize that all of these facilities are complementary; they offer additional recreation activities which tend to lengthen the stay of visitors and increase their spending.

Visitor expenditures also go directly and indirectly to the purchase of goods, thus affecting both retail and wholesale trade. The extent to which the trade sector locally manages to supply the goods will determine further employment effect. Depending on the nature of the local economy, the supply of wholesale goods may also be partially satisfied from local manufacturing establishments, again offering further job opportunities.

The Lower Mississippi Region is projected to share in the general increase in recreation participation evident throughout the country. The increase should follow national trends as indicated in Table 33.

Table 33 - Visitation Rates at Publicly Owned Recreation Areas

| Facility | 1960 Visits per 1,000 Total Population | Yearly Percent Increase in Recent Years |
|---|---|---|
| National Forest | 457 | 12 |
| National Park | 405 | 9 |
| Federal Wildlife Refuge | 56 | 12 |
| COE Reservoirs | 611 | 23 |
| TVA Reservoirs | 296 | 12 |
| State Parks | 1,514 | 8 |
| Municipal and County Parks | 5,500 | 5 |

Noncommodity Industries

Two important changes in the Lower Mississippi Region took place during the decades of the 50's and 60's which vitally affected the

composition and size of the noncommodity sector of its economy. First, there was a sizeable decline in employment in the agricultural sector which caused a large shift of population from the rural to the urban areas. Second, over the period 1950-1968, per capita income in the Lower Mississippi Region increased at a higher rate than nationally—87 percent compared with 60 percent. These changes gave rise to an expansion of both employment and earnings in the noncommodity sector. By 1960, 65 percent of employment in the Lower Mississippi Region was in the noncommodity sector (the same percentage as in the United States). Between 1950 and 1968, earnings in the noncommodity sector in the Lower Mississippi Region increased 2.3 times, thereby equaling the national rate of increase. Thus, the overall growth of the noncommodity sector reflected the new and growing demands for construction, business services, public utilities, and other social goods and services brought on by the growth in urban population and per capita incomes. These factors were reflected in the industrial composition of the noncommodity sector over the time period 1950-1968. Table 34 compares the relative importance of the various noncommodity producing industries to that of the United States in terms of earnings.

Contract construction became relatively more important, in terms of industry earnings, among the noncommodity producing industries over the period 1950-1968 while, nationally, the industry was experiencing

Table 34 - Relative Importance of Noncommodity Producing Industries 1/

| Industry | Earnings of Noncommodity Producing Industries for Indicated Years, percent | | | | | |
|---|---|---|---|---|---|---|
| | 1950 | | 1968 | | 2020 2/ | |
| | Lower Mississippi Region | United States | Lower Mississippi Region | United States | Lower Mississippi Region | United States |
| Contract Construction | 11.1 3/ | 10.0 | 12.8 3/ | 9.0 | 8.4 3/ | 7.3 |
| Transportation, Communication, and Public Utilities | 16.7 3/ | 13.6 | 12.7 3/ | 10.4 | 9.9 | 7.4 |
| Wholesale and Retail Trade | 26.1 4/ | 31.5 | 20.1 4/ | 24.9 | 19.7 4/ | 23.0 |
| Finance, Insurance, and Real Estate | 5.2 5/ | 7.1 | 6.0 5/ | 7.9 | 5.5 5/ | 6.5 |
| Services 6/ | 20.2 | 18.6 | 21.1 | 22.1 | 25.2 | 27.0 |
| Government | 20.7 | 19.2 | 27.3 | 25.7 | 31.3 | 28.7 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

1/ Data are based on information provided by the U. S. Department of Commerce, Bureau of Economic Analysis.
2/ Projected, Program A.
3/ Excludes WRPA 7.
4/ Excludes WRPA 10.
5/ Excludes WRPA's 6 and 8.
6/ Services include hotels, lodgings, business and repair services, entertainment and recreation centers, medical and professional services, and private household services.

a relative decline. The relatively faster rate of growth in the Lower Mississippi Region reflected an increased demand for construction brought on by increased urbanization in the region during the period. The transportation, communication, and public utilities industries also remained relatively more important in the Lower Mississippi Region than in the Nation over the period. The Lower Mississippi Region, however, followed the national trend with a drop in its relative importance among all noncommodity industries reflecting, in part, technological advances in communication and public utilities offset by declines in the railroad industry.

Earnings of wholesale and retail trade declined as a percentage of all noncommodity industries both in the United States and the Lower Mississippi Region. In both the 50's and 60's, however, trade made a relatively smaller contribution to total noncommodity earnings in the Lower Mississippi Region than it did nationally.

Finance, insurance, and real estate in the Lower Mississippi Region followed the national trend over the two decades, with increasing shares of total noncommodity industry earnings, although below the nationwide proportion of these industries in 1968.

Services in the Lower Mississippi Region generated 20.2 percent of noncommodity earnings, as compared with 18.6 percent nationally in 1950. A large portion of the earnings in these industries was generated by the relatively large, although declining, segment made up of private household services. By 1968, the declines in earnings in private household services were only slightly offset by gains in professional and business services so that the Lower Mississippi Region fell behind the United States in the percentage contribution of services to total noncommodity earnings.

Growth in the government sector over the two decades was generated primarily by the military segment. In 1950, the Lower Mississippi Region had a location quotient for armed forces of 0.78; by 1968, it had increased to 0.96 (see table 35).

It is expected that if the region continues to grow at the rate experienced during the period 1950-1968, the population will nearly double its 1950 level, with per capita income rising ten times by 2020. Growth of both population and income over the next several decades may exceed that projected in Program A if advantage is taken of the region's economic potential. Under the projections of both Programs A and B, by 2020, 75 percent of jobs and industry dollars earned in the Lower Mississippi Region will originate in the noncommodity producing sector (the same as for the United States).

The continuation of trends established in the Lower Mississippi

Table 35 - Location Quotients for Selected Noncommodity Industries

| Industry | Location Quotient for Indicated Areas | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Lower Mississippi Region | WRPA | | | | | | | | |
| | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Wholesale and Retail Trade | | | | | | | | | | |
| 1950 | NA 1/ | 0.81 | 1.13 | 0.87 | 0.95 | 0.75 | 0.97 | 0.91 | 0.96 | NA |
| 2020 2/ | NA | 1.09 | 1.20 | 0.79 | 0.93 | 0.99 | 0.72 | 1.12 | 0.93 | NA |
| Services 3/ | | | | | | | | | | |
| 1950 | 0.97 | 0.59 | 1.06 | 0.73 | 1.04 | 0.67 | 0.86 | 0.97 | 0.97 | 1.20 |
| 2020 2/ | 0.87 | 0.68 | 0.93 | 0.69 | 0.78 | 0.60 | 0.65 | 0.79 | 0.75 | 1.05 |
| Public Administration | | | | | | | | | | |
| 1950 | 1.00 | 0.64 | 1.03 | 0.97 | 1.12 | 0.93 | 0.97 | 1.25 | 0.94 | 1.08 |
| 2020 2/ | 1.00 | 0.97 | 0.92 | 1.14 | 1.29 | 1.48 | 1.12 | 1.09 | 0.95 | 0.89 |
| Armed Forces | | | | | | | | | | |
| 1950 | 0.78 | 0.47 | 1.06 | 0.40 | 1.06 | 0.37 | 0.38 | 0.29 | 0.30 | 1.14 |
| 2020 2/ | 1.07 | 1.03 | 1.02 | 0.26 | 0.69 | 0.27 | 0.24 | 0.21 | 6.13 | 0.26 |

1/ NA—Not available.
2/ Projected, Program A.
3/ Services include hotels, lodgings, business and repair services, entertainment and recreation centers, medical and professional services, and private household services.

Region during the period 1950-1968 will determine growth of the noncommodity producing sector in the area by 2020. It is also expected that "catch-up" behavior of industries in which the Lower Mississippi Region is underrepresented, relative to the Nation, will play an important role in the growth of this sector over the period 1968-2020.

Shifts in the distribution of industries within the noncommodity sector in the Lower Mississippi Region by 2020 will reflect endogenous factors such as population and income growth and will, for the most part, follow national trends in the shares of noncommodity producing industries' income (see table 34).

Contract construction earnings as a percentage of total noncommodity earnings will decrease but are expected to continue to represent a greater proportion of the total compared to construction nationally. The same situation is expected to hold true for transportation, communication, and public utilities, as "catch-up" behavior on the part of the regional economy is projected to continue in these two industries in the Lower Mississippi Region.

The services group in the Lower Mississippi Region did not grow at a rate equal to these industries' growth rates in the United States during the years 1950-1968. Disproportionately large regional representation of the private household sector, which declined over this period, caused the location quotient to fall for the whole services

group from 0.97 in 1950 to 0.87 in 1968. However, for the period 1968-1980, the location quotient is expected to stabilize at about 0.86 as new growth in professional services, business and repair services, and amusement and recreation services is expected to offset continued declines in private household services.

Government and armed services income growth by 2020 will leave the Lower Mississippi Region with a higher contribution to total noncommodity earnings than nationally. Most segments within government are expected to increase to or near their national averages over the period, with greater regional concentrations in the military segment.

The Lower Mississippi Region as a whole is expected to expand to account for approximately 1.6 percent of national noncommodity industry earnings under Program A as compared with 1.35 percent in 1950. Under Program B, the Lower Mississippi Region's share of national noncommodity industry earnings could rise to 1.9 percent. (The relative share of total Lower Mississippi Region noncommodity industry earnings generated in each of the WRPA's is presented in table 36.) All WRPA's,

Table 36 - Noncommodity Producing Industry Earnings Distribution 1/

| Area | Noncommodity Producing Industry Earnings for Indicated Years, thousands of 1967 dollars | | |
|---|---|---|---|
| | 1950 | 1968 | 2020 2/ |
| United States | 258,723,194 | 529,213,684 | 4,346,936,896 |
| Lower Mississippi Region | 3,495,080 | 8,027,375 | 69,975,000 |
| Percent of United States | 1.35 | 1.52 | 1.61 |
| WRPA 2 | 273,595 | 520,814 | 4,836,000 |
| Percent of Lower Mississippi Region | 7.83 | 6.49 | 6.91 |
| WRPA 3 | 832,980 | 1,806,830 | 18,582,000 |
| Percent of Lower Mississippi Region | 23.83 | 22.51 | 26.56 |
| WRPA 4 | 269,976 | 504,073 | 4,096,000 |
| Percent of Lower Mississippi Region | 7.72 | 6.28 | 5.85 |
| WRPA 5 | 438,535 | 908,320 | 7,345,000 |
| Percent of Lower Mississippi Region | 12.55 | 11.32 | 10.50 |
| WRPA 6 | 75,708 | 151,779 | 1,163,000 |
| Percent of Lower Mississippi Region | 2.17 | 1.89 | 1.66 |
| WRPA 7 | 60,366 | 121,202 | 1,034,000 |
| Percent of Lower Mississippi Region | 1.73 | 1.51 | 1.48 |
| WRPA 8 | 234,807 | 794,806 | 7,485,789 |
| Percent of Lower Mississippi Region | 6.72 | 9.90 | 10.70 |
| WRPA 9 | 271,595 | 928,055 | 6,308,219 |
| Percent of Lower Mississippi Region | 7.77 | 11.56 | 9.01 |
| WRPA 10 | 1,048,765 | 2,324,515 | 19,255,772 |
| Percent of Lower Mississippi Region | 30.01 | 28.96 | 27.52 |

1/ Data are based on information provided by the U. S. Department of Commerce, Bureau of Economic Analysis.
2/ Projected, Program A.

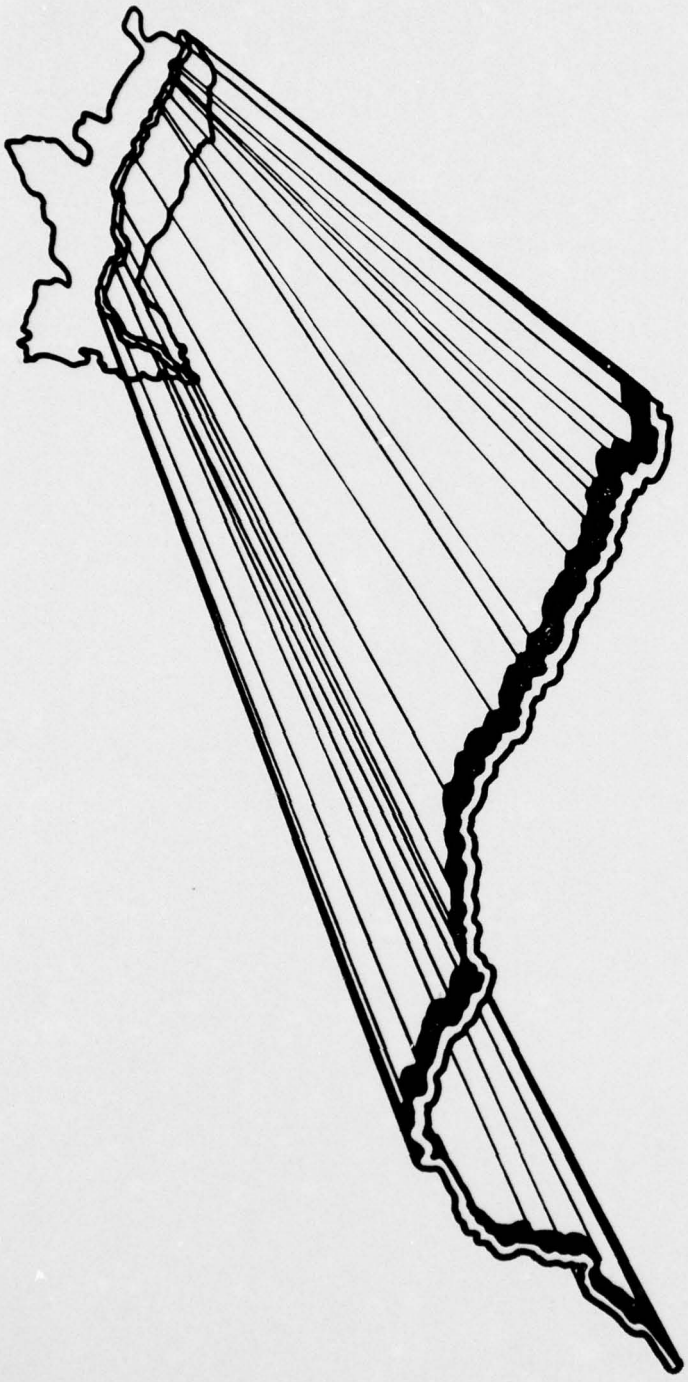
however, will not share equally in this growth. Those WRPA's having the largest population concentrations will generate the largest shares of the region's noncommodity earnings up to 2020. WRPA 10, which includes New Orleans, the largest metropolitan area in the Lower Mississippi Region, is expected to generate nearly 28 percent of regional noncommodity industry earnings. In WRPA 3, Memphis, the second largest metropolitan area in the Lower Mississippi Region, is expected to increase its regional share of noncommodity earnings to nearly 27 percent of the region's total. Baton Rouge, the third largest metropolitan area (WRPA 8), and Pine Bluff and Monroe (WRPA 5) rank third and fourth, respectively, in both population and expected share of regional noncommodity industry earnings in 2020. WRPA 9, which includes the metropolitan areas of Lafayette and Lake Charles, will generate approximately 9 percent of total regional noncommodity earnings. Together, these five WRPA's are expected to account for over 86 percent of noncommodity earnings generated in the Lower Mississippi Region in 2020.

## WRPA ECONOMIC PROFILES

In the following sections, the Lower Mississippi Region is discussed in detail by WRPA's. For the reader's convenience, a flysheet containing a drawing that shows the pertinent WRPA's physical position in the region as well as an expanded view of the WRPA itself has been inserted before the discussion of each.

WRPA Economic Profiles, as previously stipulated (page 6), are based on county boundaries, and are therefore county approximations of the hydrologically defined water resources planning areas as measured in other appendixes. Slight differences in geographic size therefore will on occasion be noted. 2/

2/ For exact hydrologic definitions and areas, see Appendix T, Plan Formulation.



# WRPA 1

# WRPA 1, LAND BETWEEN THE LEVEES

Statistical and economic data for this WRPA, comprising the narrow main stem of the Mississippi River below the mouth of the Ohio River extending to and including the main stem levees or to the top bank of the stream where levees do not exist, are included in data for other contiguous WRPA's.

The Mississippi River rises near Lake Itasca in Minnesota and flows southward about 2,500 miles to the Gulf of Mexico. Its drainage basin includes parts of two Canadian provinces and all or parts of 31 States and covers about 41 percent of the total area of the continental United States. WRPA 1 extends from Cape Girardeau, Mo., to the Head of Passes, 20 miles from the Gulf of Mexico via Southwest Pass. The main stem levees on the west bank of the Mississippi River begin just south of Cape Girardeau, Mo., and, except for gaps at points where tributaries enter the Mississippi River, extend continuously to Venice, La., just above the Head of Passes. On the east bank, the levees are not continuous because of high bluff lines near the riverbank which obviate their need.

Levees extend intermittently from the vicinity of Hickman, Ky., to a point above Vicksburg, Miss. Starting again at Baton Rouge, La., the east bank levee extends continuously to Bohemia, La., approximately 45 miles above the Head of Passes. The flow of the Mississippi River divides between two outlets to the Gulf of Mexico at the mouth of Old River. Under normal conditions, the major portion of this flow traverses the main channel of the Mississippi past New Orleans, and the remainder flows through the Atchafalaya River channel and floodways past Morgan City, La.

In recent years, agriculture, originally the principal activity in the area below Baton Rouge, has given way to industrial development based on abundant nearby resources of petroleum, salt, sulfur, and fresh water and seagoing and inland barge navigation facilities on the Mississippi River. Due to increased industrial investment along both banks of the river, large batture acreages have been developed as loading facilities for these industrial sites. This industrial usage of the batture is expected to increase in the future. Other important industrial developments extend along the Memphis Industrial Harbor.

Those lands between the levees of the main river channel and not now susceptible to flood protection offer secure habitats for wildlife. This narrow band of land, confined by levees and bluffs, holds a unique position with regard to fish and wildlife use. The once vast high-grade habitat for fish and wildlife has been concentrated into a comparatively narrow, north-south strip through the valley.

Timber production and grazing constitute the major uses made of this land between the levees. Some of the higher alluvial lands have been in cultivation for many decades; very little land clearing has been undertaken in recent years.

With minor exceptions, levees and rights-of-way are owned by levee districts, while most of the lands between the levees are in private ownership, with timber interests predominating. Lease of hunting and fishing rights to individuals and club units is progressing into an enveloping condition. Therefore, there is a conversion to restrictive and, in some instances, managed types of hunting and fishing areas. Some of the best deer, turkey, squirrel, and waterfowl hunting within each State bordering the main channel is found in this habitat remnant.

In addition to hunting, good fishing is provided within the channel overflow area. Important permanent-water sport fishing areas include the cutoff and meander lakes and the borrow pits along the levees. Commercial fish catches of local economic importance are taken from the river, lakes, and especially from the floodplain when the river exceeds bank-full stages.

Although there is substantial industrial and agricultural activity within the levees, economic parameters for WRPA I are included in the adjoining WRPA's. These indexes cannot be disaggregated at this time.

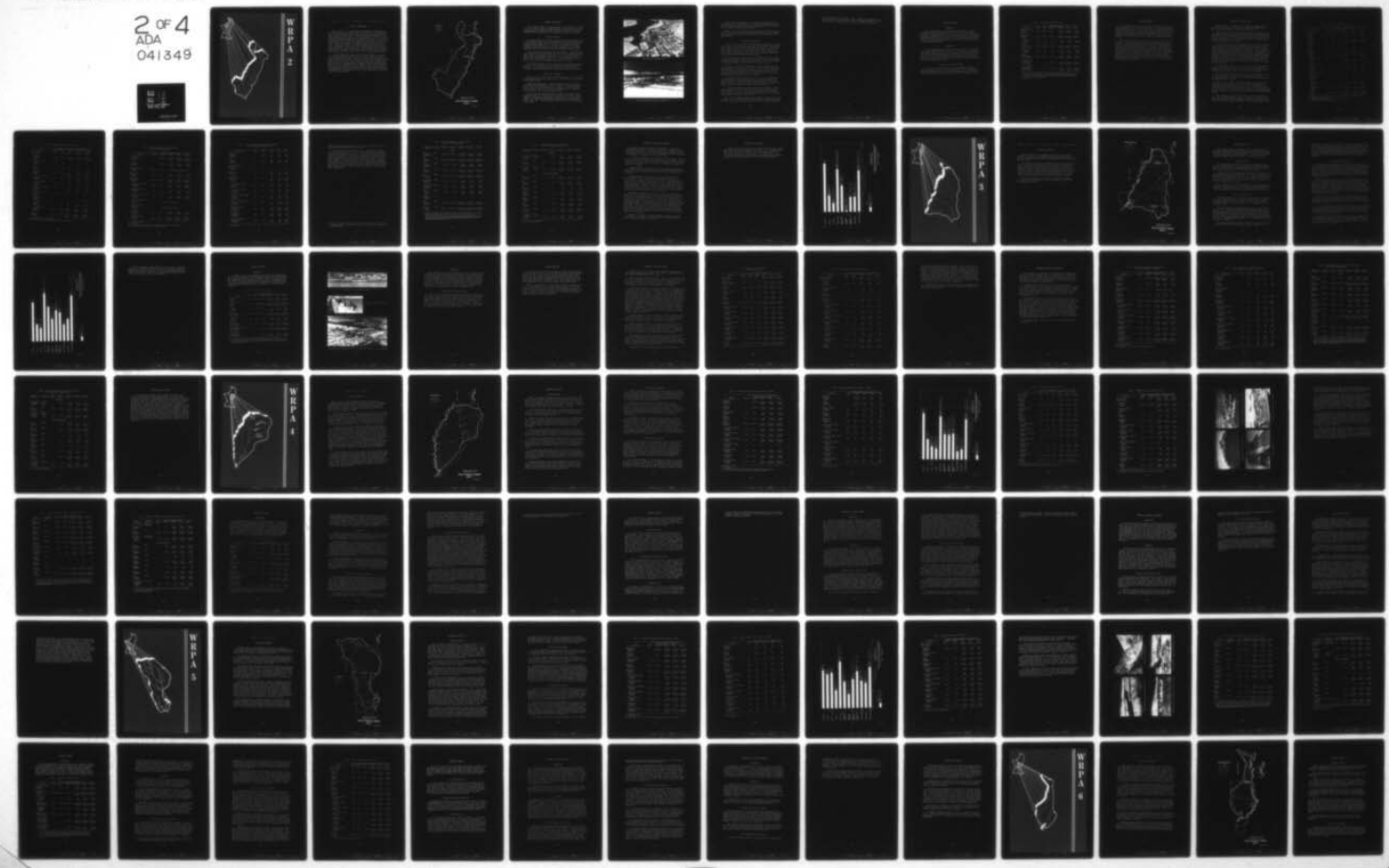


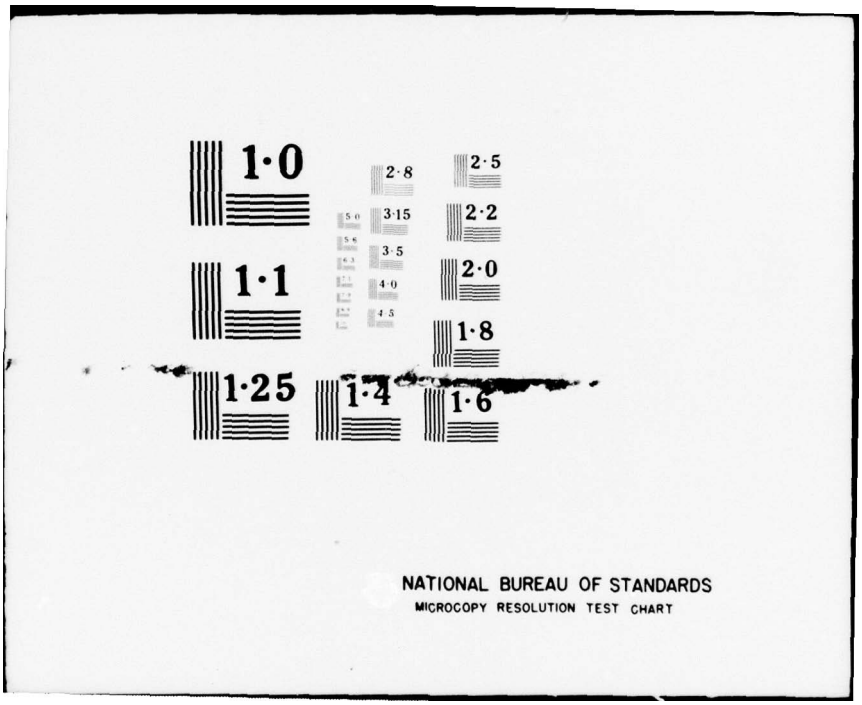
Barges in tow on Mississippi River near Memphis, Tenn.

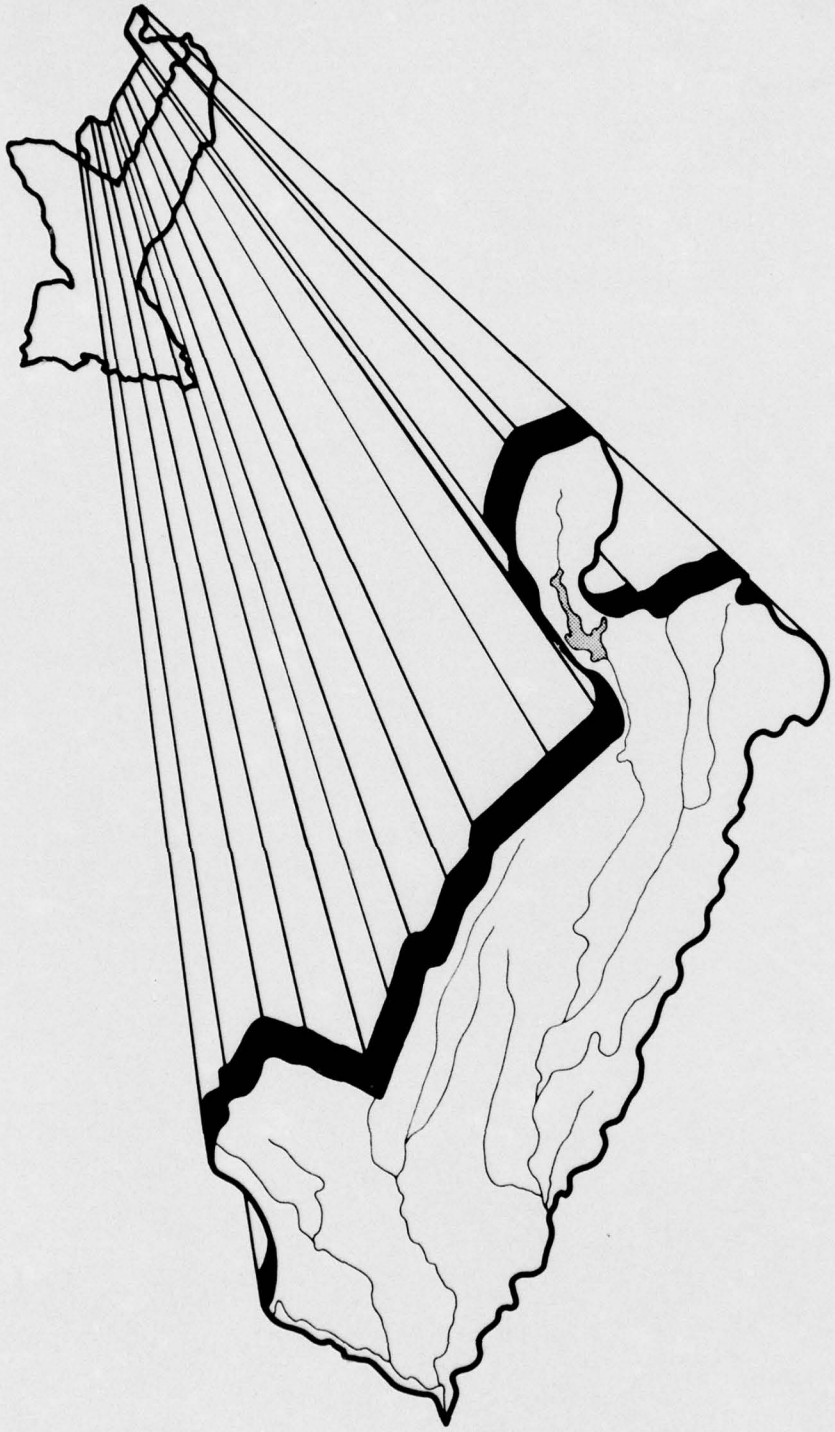
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# WRPA 2

# WRPA 2, ST. FRANCIS - LOWER WHITE

## PHYSICAL DESCRIPTION

WRPA 2 (figure 7) is based upon county boundaries approximating the hydrological area drained by the St. Francis River in Arkansas and Missouri, the White River below Newport, Ark,, and Bayou Meto, which drains into the Arkansas River. The area includes 16 counties in northeastern Arkansas and 10 counties in southeastern Missouri. The eastern portion of the WRPA borders the Mississippi River and has physical features characteristic of the Mississippi alluvial valley. The area is low and flat and streamflows are sluggish, draining generally north to south. During major floods, drainage boundaries are largely nonexistent. The alluvial valley is bisected by Crowley's Ridge which runs in a northeasterly arc from Helena, Ark., to above Malden, Mo. The basin floor rises to a height of about 750 ft above sea level in the Missouri Ozark Highland and drops to about 200 to 400 ft along Crowley's Ridge.

The lower White River region in the alluvial valley is, in general, a gently undulating plain about 150 ft above mean sea level at its southern extremity. This area rises to the north and northwest at a slope of about 2/3 ft/mile. Tributary streams flow sluggishly through broad, shallow valleys in sinuous channels along courses parallel to the main stream. The bottomlands are characterized by numerous swamps, bayous, lakes, and abandoned stream channels. Significant features of the basin include portions of Crowley's Ridge, which extends along the east boundary in Arkansas from the vicinity of the Missouri State line to Jonesboro and from Marianna to Helena. These uplands have crests up to 200 ft above the plain.




LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

**WATER RESOURCE PLANNING**
**AREA 2**

FIGURE 7

## ECONOMIC DESCRIPTION

The economy of WRPA 2 is based primarily on agriculture. In 1968, 29 percent of the total agricultural earnings of the Lower Mississippi Region originated in WRPA 2. Water resource development has played a prominent role in enhancing the agricultural potential of this WRPA.

### Natural Resources

The natural resources of this area are the rich agricultural lands of the alluvial valley, the river transportation system, and the abundant underground supply of water suitable for personal consumption, irrigation, and industrial use. The rich agricultural lands are of particular importance because of the ample rainfall well distributed throughout the year, the mild climate, and the long growing season.

Commercial forest land within the area amounts to 2,746,900 acres, almost 24 percent of the planning area. This area of commercial forest land includes an aggregate of 2,297,300 acres of privately-owned, and 449,600 acres of government-owned forests. National Forest System lands on the Clark and the Ozark and St. Francis National Forests comprise 54 percent of all the public commercial forest land.

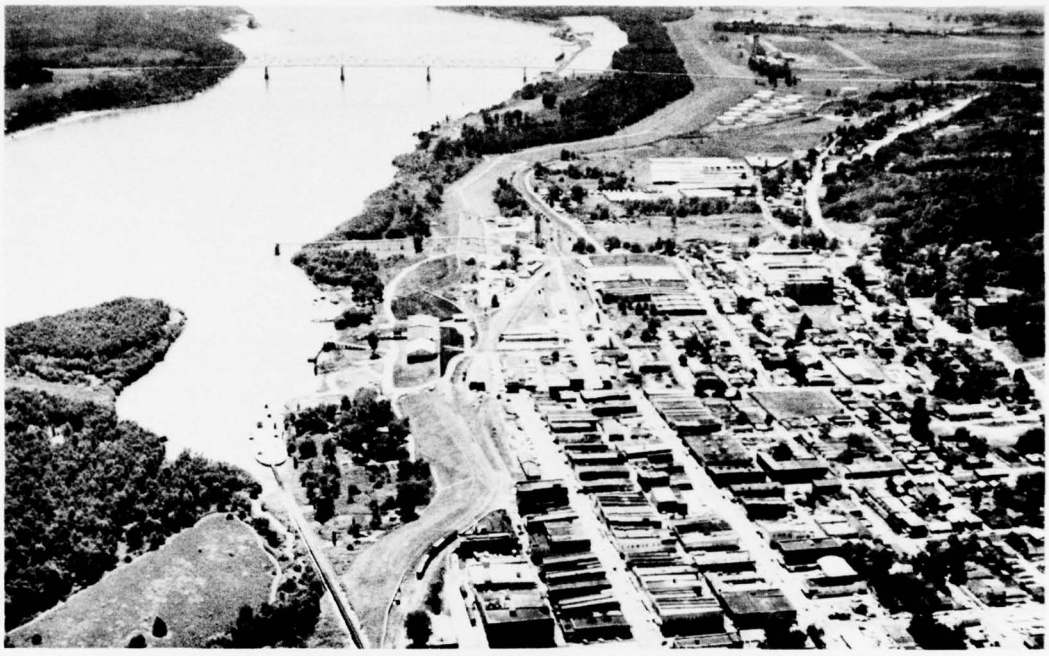
The forests of WRPA 2 have been typed into six major forest classifications which represent a broad spectrum of softwood and hardwood resources. The most common types are oak-hickory which occupies 38 percent and oak-gum-cypress which occupies 35 percent of the area.

### Industrial Development

WRPA 2 is in the early stages of industrialization. Sixty percent of the population is classified as rural. The largest city has a population under 30,000.

Industrial development is centered in the Missouri cities of Charleston (1970 population, 5,131), New Madrid (2,719), and Caruthersville (7,350) and the Arkansas cities of Jonesboro (27,050), Blytheville (24,752), Forrest City (12,521), Paragould (10,639), Stuttgart (10,477), Helena (10,415), and Marianna (6,196).

Much of the industrial development in WRPA 2 is related to agriculture and forestry. Relative to the importance they occupy in the industrial composition of the Nation as a whole, the food and kindred products and lumber and wood products industries are of major importance in this area. Shoe and apparel industries are also concentrated in this WRPA.



Riverfront at Helena, Ark.



St. Jude Industrial Park, New Madrid, Mo.

Primary metal manufacturing is of increasing importance in the northeastern part of this WRPA. Recent industrial development related to the refining of aluminum accounts for approximately 1.5 percent of the total WRPA 2 manufacturing employment.

Mining is also of significance in the extreme northern portion of the WRPA. Production of iron ore at Pilot Knob, Mo., exceeds 1 million tons annually and accounts for about half of the total mining employment in WRPA 2.

## Agricultural Development

Most of the farms in WRPA 2 are commercial and produce a wide variety of crops. A larger share of food and fiber accrues from this WRPA than from any other WRPA in the Lower Mississippi Region. The average size of farms in the area is greater than that in the other WRPA's. Also, there are more farms in the larger size groups. Prior to 1964, tenant farmers outnumbered other tenure groups; however, beginning in 1964, full owners outnumbered all other groups.

There were 80,549 farms in the area in 1949 and 23,340 in 1970, a decline of 71 percent. During the same period, land in farms remained essentially unchanged at approximately 8 million acres. Average farm size increased from 102 acres in 1949 to 351 acres in 1970.

In 1970, the major crops produced in terms of acreage were soybeans, cotton, rice, wheat, corn, and hay. These six crops accounted for 99 percent of total harvested acreage. Practically all the rye in the Lower Mississippi Region is grown in WRPA 2, more than half the barley and wheat, almost half the rice, about one-third of the corn, and slightly less than one-third of the cotton.

Livestock and poultry enterprises are not nearly so important as crop enterprises. However, in 1970 there were approximately 2,116 farms classified as livestock, dairy, and poultry farms. During the period 1959-1970, there was an upward trend in the sale of cattle and calves, chickens, turkeys, broilers, eggs, and whole milk.

In 1970, farm marketing receipts totaled $680.0 million. Field crops accounted for 92 percent of the total, and livestock and livestock products 8 percent. Total gross farm income was approximately $790.7 million, realized net farm income approximately $237.2 million, and derived net income per farm $10,163.

WRPA 2 has not depended heavily upon forestry to support its total economy. Forestry, fishery, lumber, and furniture earnings represented less than 3.0 percent of total earnings in 1950, 2.2 percent in 1962,

and 3.0 percent in 1967 and 1968. These earnings are projected to continue to decline to 3.0 percent in 1980, 2.9 percent in 1990, 2.7 percent in 2000, 2.5 percent in 2010, and only 2.3 percent in 2020.

## HISTORICAL TRENDS

### Population

Between 1950 and 1970, the population declined from 777,234 to 626,690, a decline of 19 percent. In line with the general trend throughout the United States, there was a decrease in the rural population, with a concomitant increase in the urban population. This decline in population was caused principally by the loss of employment opportunities in the agricultural sector, which forced agricultural laborers to seek employment elsewhere.

### Employment

The total employment declined from 234,608 in 1950 to 201,680 in 1960 and to 214,400 in 1968. An analysis of the changes in the employment pattern shows that agriculture, employing 118,684 persons in 1950 (51 percent of the total work force), employed only 64,898 persons in 1960 (32 percent of the total work force). During the same period, manufacturing employment increased from 22,468 to 31,106, or 15 percent of the total work force in 1960.

### Personal and Per Capita Income

Low per capita income is one of the main problems in WRPA 2. Table 37, however, shows that the per capita income has been rising toward the national level in the past two decades, i.e., from 52 percent of the national per capita income in 1950 to 66 percent in 1968.

Table 37 - Economic Profile Summary for WRPA 2

| Parameter | Data for Indicated Years | | | | | |
|---|---|---|---|---|---|---|
| | 1950 | 1959 | 1968 | 1980 | 2000 | 2020 |
| Population (1 July) 1/ | | | | | | |
| Program A | 777,234 | 664,597 | 640,402 | 625,000 | 684,000 | 795,000 |
| Program B | -- | -- | -- | 671,000 | 766,000 | 925,000 |
| Personal Income 2/ | | | | | | |
| Program A | 841,084 | 961,105 | 1,384,020 | 2,011,000 | 4,327,000 | 9,498,000 |
| Program B | -- | -- | -- | 2,205,000 | 5,004,000 | 11,200,000 |
| Per Capita 2/ | | | | | | |
| Program A | 1,082 | 1,446 | 2,161 | 3,200 | 6,300 | 11,900 |
| Program B | -- | -- | -- | 3,300 | 6,500 | 12,100 |
| Earnings 2/ | | | | | | |
| Total, Program A | 702,719 | 801,783 | 1,074,208 | 1,523,000 | 3,241,000 | 7,215,000 |
| Total, Program B | -- | -- | -- | 1,670,000 | 3,748,000 | 8,510,000 |
| Per Worker 2/ | | | | | | |
| Program A | 2,995 | 3,976 | 5,010 | 7,118 | 12,853 | 22,956 |
| Program B | -- | -- | -- | 7,118 | 12,853 | 22,956 |
| Employment | | | | | | |
| Total, Program A | 234,608 | 201,680 | 214,400 | 214,000 | 252,000 | 314,000 |
| Total, Program B | -- | -- | -- | 235,000 | 292,000 | 371,000 |
| Gross Manufacturing Product 2/ | | | | | | |
| Total, Program A | -- | -- | 320,280 | 554,000 | 1,407,000 | 3,352,000 |
| Total, Program B | -- | -- | -- | 608,000 | 1,628,000 | 3,954,000 |
| Gross Farm Marketing Receipts 2/ | | | | | | |
| Total, Program A | -- | -- | 679,965 3/ | 761,000 | 895,000 | 1,026,000 |
| Total, Program B | -- | -- | -- | 761,000 | 963,000 | 1,100,000 |

1/ U. S. Bureau of Census figures show the 1970 population of WRPA 2 as 626,690.
2/ Personal income, total earnings, gross manufacturing product, and gross farm marketing receipt data are given in thousands of 1967 dollars; per capita income and per worker earnings are given in 1967 dollars.
3/ 1970 data.

## ECONOMIC PROBLEMS

As of January 1972, 18 of the 26 counties in WRPA 2 were designated as eligible for assistance under Title IV of the Public Works and Economic Development Act of 1965. Under this act, qualified areas can obtain public work grants and loans and business development loans designed to create new jobs and stimulate economic growth. Criteria for an eligibility designation includes persistently high rates of unemployment, substantial population loss, and/or low median family income levels.

Most counties in WRPA 2 display all of these symptoms of economic ill-health. Per capita incomes are only 65 percent of the national average. High rates of unemployment reflect loss of employment opportunities in the agricultural sector of the economy coupled with the failure of the fabricative and service sectors to provide sufficient job opportunities to absorb displaced farm workers. High unemployment over extended periods encourages emigration. High rates of emigration in WRPA 2 over the period 1950-1970 made it the leader in terms of population loss among all WRPA's in the Lower Mississippi Region. The WRPA had 151,000 fewer people in 1970 than it had 20 years earlier. Population loss of this magnitude seriously impairs the orderly growth and development of any area.

## PROGRAM A, NATIONAL INCOME

Under Program A it is forecast that population, employment, personal income, and earnings will grow at a decidedly slower rate in WRPA 2 than in the region or the Nation (tables 37-39).

Table 37 indicates that between 1980 and 2000, the downward trend in population will be reversed. From 1968 to 2020, the area population will increase at an annual growth rate of 0.42 percent, for an overall increase of 24 percent. In comparison, the United States population for the same period will grow at an annual rate of 1.3 percent, with an overall total increase of 100 percent.

Between 1960 and 1980, total employment will reverse its downward trend. From 1980 to 2020, area employment will increase about 1 percent per year, for a total increase of 47 percent. During the same period, employment in the United States will increase at an annual rate of 1.4 percent, for a total increase of 74 percent. An analysis of the trends in area employment from 1960 to 2020 reveals agricultural employment decreasing 61 percent and manufacturing employment increasing 221 percent. During the same period in the United States, agricultural employment will decline 59 percent, and manufacturing employment will increase 215 percent. The largest segments of manufacturing will be the food and kindred products, primary metals, and chemical and allied products industries.

Total personal income is forecast to increase from $1.4 billion in 1968 to $9.5 billion in 2020. This is an increase of 686 percent, as measured in 1967 constant dollars. The increase for the whole of the United States over this period is forecast to be 863 percent.

Income per person in the WRPA will increase from $2,161 in 1968 to $11,900 (1967 dollars) in 2020. This represents an increase of 551 percent in WRPA 2, as compared with an increase of 432 percent for the United States as a whole.

WRPA 2 had a per capita income level that was 66 percent of the United States level in 1968, but this is expected to increase to 84 percent of the United States average by 2020. WRPA 2 had a per capita income that was 88 percent of the Lower Mississippi Region average in 1968, but by 2020 it will reach 99 percent. It is predicted that per capita incomes of all WRPA's will rise toward national and regional levels.

Total earnings (table 38) are forecast to increase 474 percent from 1980 to 2020; per worker earnings, 323 percent. During the same period, United States total earnings are expected to increase 493 percent and per worker earnings 283 percent. After 1980, earnings in the

Table 38 - Earnings by Major Industries in WRPA 2

| Industry | Earnings for Indicated Years 1/ | | | | | |
|---|---|---|---|---|---|---|
| | 1950 | 1959 | 1968 | 1980 | 2000 | 2020 |
| Total, Program A | 702,719 | 801,783 | 1,074,208 | 1,523,000 | 3,241,000 | 7,215,000 |
| Total, Program B | -- | -- | -- | 1,670,000 | 3,748,000 | 8,510,000 |
| Per Worker | | | | | | |
| Program A | 2,995 | 3,976 | 5,010 | 7,118 | 12,853 | 22,956 |
| Program B | -- | -- | -- | 7,118 | 12,853 | 22,956 |
| Agriculture | | | | | | |
| Program A | 369,357 | 360,480 | 355,402 | 313,000 2/ | 395,000 2/ | 684,000 2/ |
| Program B | -- | -- | -- | 343,000 2/ | 457,000 2/ | 807,000 2/ |
| Forestry & Fisheries | | | | | | |
| Program A | 2,527 | 1,447 | 416 | -- | -- | -- |
| Program B | -- | -- | -- | -- | -- | -- |
| Mining | | | | | | |
| Program A | 6,593 | 8,346 | 8,991 | 8,000 | 10,000 | 15,000 |
| Program B | -- | -- | -- | 9,000 | 12,000 | 17,000 |
| Manufacturing | | | | | | |
| Program A | 50,645 | 81,869 | 188,586 | 311,000 | 737,000 | 1,680,000 |
| Program B | -- | -- | -- | 340,000 | 852,000 | 1,982,000 |
| Food & Kindred Products | | | | | | |
| Program A | 11,679 | 14,580 | 21,966 | 24,000 | 37,000 | 59,000 |
| Program B | -- | -- | -- | 26,000 | 42,000 | 69,000 |
| Textile Mill Products | | | | | | |
| Program A | 74 | 959 | 882 | 1,500 | 2,500 | 4,200 |
| Program B | -- | -- | -- | 1,700 | 2,900 | 5,000 |
| Chemical & Allied Products | | | | | | |
| Program A | 1,182 | 372 | 3,194 | 2,900 | 6,800 | 15,100 |
| Program B | -- | -- | -- | 3,200 | 7,800 | 17,800 |
| Paper & Allied Products | | | | | | |
| Program A | W 3/ | W | W | W | W | W |
| Program B | -- | -- | -- | W | W | W |
| Petroleum Refining | | | | | | |
| Program A | W | W | W | W | W | W |
| Program B | -- | -- | -- | W | W | W |
| Primary Metals | | | | | | |
| Program A | 0 | 1,107 | 5,170 | 7,800 | 15,400 | 28,500 |
| Program B | -- | -- | -- | 8,500 | 17,800 | 33,600 |
| Other Manufacturing | | | | | | |
| Program A | 37,710 | 64,851 | 157,374 | 275,000 | 675,000 | 1,574,000 |
| Program B | -- | -- | -- | 301,000 | 781,000 | 1,856,000 |
| All Other | | | | | | |
| Program A | 273,595 | 349,639 | 520,814 | 891,000 | 2,099,000 | 4,836,000 |
| Program B | -- | -- | -- | 978,000 | 2,427,000 | 5,704,000 |

1/ All earnings except per worker earnings are given in thousands of 1967 dollars; per worker earnings are given in 1967 dollars.
2/ Includes forestry & fisheries data.
3/ W—Withheld to avoid disclosing company confidential information.

Table 39 - Employment by Major Industries in WRPA 2

| Industry | Number of People Employed in Indicated Years | | | | |
|---|---|---|---|---|---|
| | 1950 | 1960 | 1980 | 2000 | 2020 |
| Total, Program A | 234,608 | 201,680 | 214,000 | 252,000 | 314,000 |
| Total, Program B | -- | -- | | 292,000 | 371,000 |
| Agriculture | | | | | |
| Program A | 118,684 | 64,898 | 32,000 1/ | 25,000 1/ | 25,000 1/ |
| Program B | -- | -- | 32,000 1/ | 27,000 1/ | 27,000 1/ |
| Forestry & Fisheries | | | | | |
| Program A | 3,648 | 2,116 | -- | -- | -- |
| Program B | -- | -- | -- | -- | -- |
| Mining | | | | | |
| Program A | 812 | 857 | 820 | 610 | 520 |
| Program B | -- | -- | 900 | 710 | 610 |
| Manufacturing | | | | | |
| Program A | 22,468 | 31,106 | 39,000 | 53,000 | 69,000 |
| Program B | -- | -- | 43,000 | 61,000 | 81,000 |
| Food & Kindred Products | | | | | |
| Program A | 3,196 | 4,609 | 2,900 | 2,700 | 2,600 |
| Program B | -- | -- | 3,170 | 3,100 | 3,000 |
| Textile Mill Products | | | | | |
| Program A | 163 | 356 | 220 | 210 | 190 |
| Program B | -- | -- | 240 | 240 | 220 |
| Chemical & Allied Products | | | | | |
| Program A | 980 | 398 | 360 | 480 | 610 |
| Program B | -- | -- | 390 | 560 | 720 |
| Paper & Allied Products | | | | | |
| Program A | W 2/ | W | W | W | W |
| Program B | -- | -- | W | W | W |
| Petroleum Refining | | | | | |
| Program A | W | W | W | W | W |
| Program B | -- | -- | W | W | W |
| Primary Metals | | | | | |
| Program A | 0 | 214 | 830 | 1,000 | 1,100 |
| Program B | -- | -- | 910 | 1,200 | 1,300 |
| Other Manufacturing | | | | | |
| Program A | 18,038 | 25,320 | 35,000 | 48,000 | 64,000 |
| Program B | -- | -- | 38,000 | 56,000 | 76,000 |
| All Other | | | | | |
| Program A | 88,996 | 102,703 | 142,000 | 173,000 | 219,000 |
| Program B | -- | -- | 159,000 | 203,000 | 262,000 |

1/ Includes forestry & fisheries data.
2/ W—Withheld to avoid disclosing company confidential information.

Table 40 - Gross Product Originating by Major Industries
WRPA 2, St. Francis-Lower White

| Industry | Thousands of 1967 Dollars | | | | |
|---|---|---|---|---|---|
| | 1967 | 1968 | 1980 | 2000 | 2020 |
| Agriculture 1/ | | | | | |
| Program A | -- | 679,965 2/ | 761,000 | 895,000 | 1,026,000 |
| Program B | -- | -- | 761,000 | 963,000 | 1,100,000 |
| Forestry 3/ | | | | | |
| Program A | -- | 9,100 2/ | 15,000 | 20,000 | 22,000 |
| Program B | -- | -- | 19,000 | 27,000 | 37,000 |
| Mining, Petroleum | | | | | |
| Program A | D 4/ | D 4/ | (Included in higher totals.) | | |
| Program B | | | | | |
| Quarrying | | | | | |
| Program A | 3,140 | 3,328 | 5,200 | 9,600 | 18,000 |
| Program B | -- | -- | 5,600 | 11,100 | 22,000 |
| Manufacturing | | | | | |
| Program A | 299,327 | 320,280 | 554,000 | 1,407,000 | 3,352,000 |
| Program B | -- | -- | 608,000 | 1,628,000 | 3,954,000 |
| Food & Kindred Products | | | | | |
| Program A | 37,692 | 39,200 | 44,000 | 69,000 | 111,000 |
| Program B | -- | -- | 48,000 | 79,000 | 131,000 |
| Textile Mill Products | | | | | |
| Program A | 1,452 | 1,220 | 2,100 | 3,500 | 5,900 |
| Program B | -- | -- | 2,300 | 4,100 | 7,000 |
| Chemical & Allied Products | | | | | |
| Program A | 6,872 | 7,353 | 7,200 | 19,000 | 45,000 |
| Program B | -- | -- | 7,900 | 22,000 | 53,000 |
| Paper & Allied Products | | | | | |
| Program A | (Included in higher totals.) | | | | |
| Program B | | | | | |
| Petroleum Refining | | | | | |
| Program A | (Included in higher totals.) | | | | |
| Program B | | | | | |
| Primary Metals | | | | | |
| Program A | 6,609 | 7,666 | 12,000 | 24,000 | 44,000 |
| Program B | -- | -- | 13,000 | 27,000 | 52,000 |
| Other Manufacturing | | | | | |
| Program A | 246,702 | 264,841 | 489,000 | 1,292,000 | 3,146,000 |
| Program B | -- | -- | 537,000 | 1,496,000 | 3,711,000 |

1/ Marketing receipts.
2/ 1970 data.
3/ Value at local point of delivery including stumpage, cutting, and hauling.
4/ D—Deleted to avoid disclosure of confidential data.

Table 41 - Index of Output by Major Industries, WRPA 2
St. Francis-Lower White (1967 = 100)

| Industry | 1967 | 1968 | 1980 | 2000 | 2020 |
|---|---|---|---|---|---|
| Agriculture | | | | | |
| Program A | -- | 100 1/ | 112 | 132 | 151 |
| Program B | -- | -- | 112 | 142 | 162 |
| Forestry | | | | | |
| Program A | -- | 100 1/ | 168 | 214 | 240 |
| Program B | -- | -- | 210 | 298 | 407 |
| Mining, Petroleum | | | | | |
| Program A | -- | -- | -- | -- | -- |
| Program B | -- | -- | -- | -- | -- |
| Quarrying | | | | | |
| Program A | 100 | 106 | 164 | 307 | 582 |
| Program B | -- | -- | 180 | 355 | 686 |
| Manufacturing | | | | | |
| Program A | 100 | 107 | 185 | 470 | 1,120 |
| Program B | -- | -- | 203 | 544 | 1,321 |
| Food & Kindred Products | | | | | |
| Program A | 100 | 104 | 117 | 182 | 295 |
| Program B | -- | -- | 128 | 210 | 348 |
| Textile Mill Products | | | | | |
| Program A | 100 | 84 | 145 | 243 | 408 |
| Program B | -- | -- | 159 | 281 | 481 |
| Chemical & Allied Products | | | | | |
| Program A | 100 | 107 | 105 | 271 | 658 |
| Program B | -- | -- | 115 | 313 | 776 |
| Paper & Allied Products | | | | | |
| Program A | 100 | 105 | 173 | 386 | 857 |
| Program B | -- | -- | 190 | 446 | 1,011 |
| Petroleum Refining | | | | | |
| Program A | 100 | 296 | 501 | 1,066 | 2,073 |
| Program B | -- | -- | 549 | 1,233 | 2,445 |
| Primary Metals | | | | | |
| Program A | 100 | 116 | 181 | 359 | 663 |
| Program B | -- | -- | 198 | 415 | 782 |
| Other Manufacturing | | | | | |
| Program A | 100 | 107 | 198 | 524 | 1,275 |
| Program B | -- | -- | 218 | 606 | 1,504 |

1/ 1970 = 100.

manufacturing sector will surpass those of the agricultural sector as the primary source of earnings in the area.

Production of most agricultural crops is projected to increase between 1970 and 2020 (table 42). Of the major crops, large increases are projected for wheat and soybeans. Livestock numbers and livestock products are projected to increase in all categories. Certain expenditures will have to be made by farm proprietors in WRPA 2 to achieve this production, and these expenditures will in themselves generate added economy. It is projected that by 2020, WRPA 2 farm proprietors will spend $835 million on production items, approximately $282 million more than in 1970. The money spent on these items will have a great impact on the economy of WRPA 2 by generating trade in both small and large communities. 1/

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1/ Proposed resource development measures are presented in Appendix F, Land Resources.

Table 42 - Agricultural Production, Crop and Livestock
WRPA 2, St. Francis-Lower White

| Industry | Unit | 1959 | 1970 | 1980 | 2000 | 2020 |
|---|---|---|---|---|---|---|
| | | | Crop | | | |
| Cotton | Bales | | | | | |
| Program A 1/ | | 1,466,220 | 1,264,020 | 1,371,000 | 1,490,000 | 1,609,000 |
| Program B 1/ | | -- | -- | 1,371,000 | 1,600,000 | 1,728,000 |
| Corn | Bushels | | | | | |
| Program A | | 19,502,559 | 14,000,000 | 9,261,000 | 12,801,000 | 15,312,000 |
| Program B | | -- | -- | 9,261,000 | 13,751,000 | 16,443,000 |
| Sorghum | Bushels | | | | | |
| Program A | | 590,270 | 127,500 | 237,000 | 305,000 | 422,000 |
| Program B | | -- | -- | 237,000 | 328,000 | 454,000 |
| Oats | Bushels | | | | | |
| Program A | | 3,854,825 | 1,760,000 | 1,911,000 | 1,973,000 | 2,046,000 |
| Program B | | -- | -- | 1,911,000 | 2,120,000 | 2,197,000 |
| Rice | Bushels | | | | | |
| Program A | | 23,206,345 | 36,471,732 | 38,710,000 | 45,648,000 | 54,321,000 |
| Program B | | -- | -- | 38,710,000 | 49,037,000 | 58,334,000 |
| Irish Potatoes | Bushels | | | | | |
| Program A | | 190,721 | 52,500 | 32,000 | 42,000 | 54,000 |
| Program B | | -- | -- | 32,000 | 45,000 | 58,000 |
| Sweet Potatoes | Bushels | | | | | |
| Program A | | 194,656 | 60,000 | 42,000 | 44,000 | 55,000 |
| Program B | | -- | -- | 42,000 | 47,000 | 59,000 |
| Tobacco | Pounds | | | | | |
| Program A | | 1,554 | 4,900 | 24,000 | 27,000 | 31,000 |
| Program B | | -- | -- | 24,000 | 29,000 | 33,000 |
| Sugarcane | Tons | | | | | |
| Program A | | 0 | 0 | 0 | 0 | 0 |
| Program B | | -- | -- | 0 | 0 | 0 |
| Wheat | Bushels | | | | | |
| Program A | | 6,342,029 | 6,943,200 | 22,991,000 | 27,508,000 | 30,516,000 |
| Program B | | -- | -- | 22,991,000 | 29,550,000 | 32,766,000 |
| Soybeans | Bushels | | | | | |
| Program A | | 38,189,407 | 80,500,000 | 117,517,000 | 141,940,000 | 161,600,000 |
| Program B | | -- | -- | 117,517,000 | 152,480,000 | 173,500,000 |

1/ Program A incorporates 1970 production estimates. Program B reflects the projected national growth-rate shown in Table II-3, Selected Agricultural Products, Pages II-18 through II-22, Volume 1, Economic Activity in the United States by Water Resource Regions and Subareas, Historical and Projected, 1929-2020, United States Water Resources Council, April 1971.

Table 42 - Agricultural Production, Crop and Livestock
WRPA 2, St. Francis-Lower White (Con.)

| Industry | Unit | 1959 | 1970 | 1980 | 2000 | 2020 |
|---|---|---|---|---|---|---|
| | | | Crop (Con.) | | | |
| Forest Products | Thousand | | | | | |
| Program A | Cubic | -- | 43,200 | 73,000 | 93,000 | 104,000 |
| Program B | Feet | -- | -- | 91,000 | 129,000 | 176,000 |
| Hay | Tons | | | | | |
| Program A | | 232,055 | 237,670 | 317,000 | 391,000 | 483,000 |
| Program B | | -- | -- | 317,000 | 420,000 | 519,000 |
| Gross Value of Crops | Thousand 1967 | | | | | |
| Program A | Dollars | 435,000 | 627,608 | 686,000 | 796,000 | 895,000 |
| Program B | | -- | -- | 686,000 | 857,000 | 966,000 |
| | | | Livestock Thousands 2/ | | | |
| Beef | Pounds | | | | | |
| Program A | | -- | 126,682 | 161,361 | 217,202 | 291,698 |
| Program B | | -- | -- | 161,361 | 233,327 | 315,249 |
| Pork | Pounds | | | | | |
| Program A | | -- | 76,897 | 87,749 | 114,617 | 148,782 |
| Program B | | -- | -- | 87,749 | 123,126 | 159,775 |
| Lamb | Pounds | | | | | |
| Program A | | -- | 137 | 105 | 124 | 152 |
| Program B | | -- | -- | 105 | 133 | 163 |
| Chickens | Pounds | | | | | |
| Program A | | -- | 16,789 | 23,431 | 32,717 | 43,924 |
| Program B | | -- | -- | 23,431 | 35,146 | 47,169 |
| Turkeys | Pounds | | | | | |
| Program A | | -- | 1,567 | 2,095 | 2,942 | 3,973 |
| Program B | | -- | -- | 2,095 | 3,160 | 4,267 |
| Eggs | Dozen | | | | | |
| Program A | | -- | 35,609 | 39,127 | 50,085 | 63,440 |
| Program B | | -- | -- | 39,127 | 53,803 | 68,127 |
| Milk | Pounds | | | | | |
| Program A | | -- | 104,365 | 95,893 | 118,356 | 144,545 |
| Program B | | -- | -- | 95,893 | 127,144 | 155,224 |
| Gross Value of Livestock | 1967 Dollars | | | | | |
| Program A | | 40,468 | 52,357 | 75,433 | 99,317 | 130,198 |
| Program B | | -- | -- | 75,433 | 106,691 | 139,819 |

2/ Net liveweight production.

## PROGRAM B, REGIONAL DEVELOPMENT

Program B, accelerated regional development, is based on the assumption that the WRPA can achieve a higher rate of growth than projected under Program A. The significant feature of Program B is that the population decline which has been experienced over recent decennial census periods is forecast to be reversed by 1980.

By 1980, both population and employment will turn upward. Population is forecast to increase at an annual rate of 0.71 percent over the period 1968-2020, for a total increase of 44 percent. Employment will increase at an annual rate of 1.1 percent, a total increase over the period of 73 percent.

As under Program A, only two of the major water-using industries show employment gains over the period. The chemical industry will gain moderately, and the primary metals industry will gain substantially (table 39).

Personal income will increase from $1.4 billion in 1968 to $11.2 billion in 2020. This represents an annual growth rate of 4.1 percent and a total increase of 709 percent. Per capita income will increase to $12,000 (1967 dollars) by 2020. Under Program B, the area's per capita personal income will rise more rapidly toward the national average. In 1968, per capita income in WRPA 2 was 66 percent of the United States average; in 1980, it will be 78 percent as great, and in 2020, 85 percent as great. These percentages are approximately two points higher than under Program A forecasts.

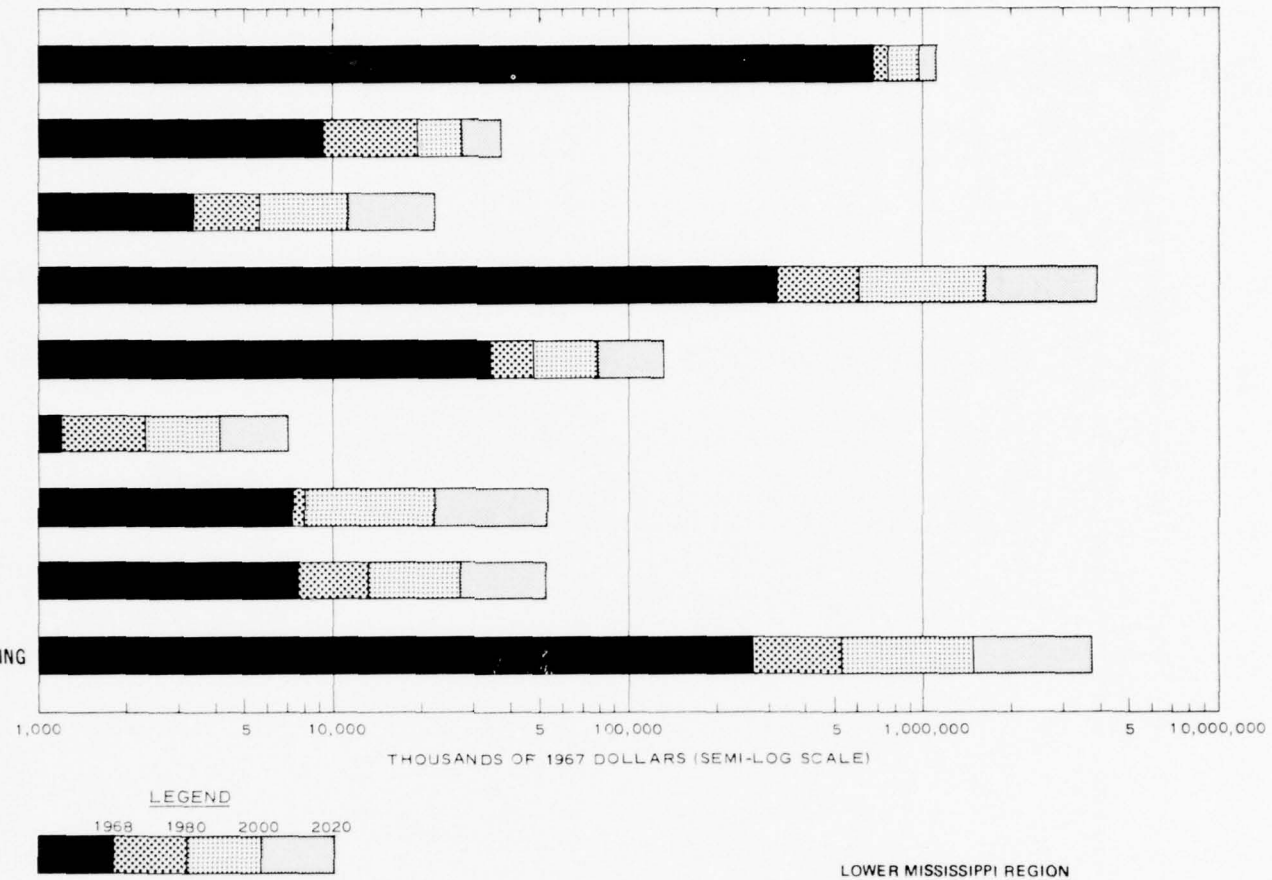
Agricultural production is projected to increase 63 percent between 1970 and 2020, approximately 12 percent more than for Program A. The levels of agricultural output are the same for Programs A and B in the year 1980. However, for the years 2000 and 2020, the level of agricultural output will increase as a result of the assumptions made regarding Program B. Certain expenditures will have to be made by farm proprietors in WRPA 2 to achieve the projected level of production. By 2020, WRPA 2 farm proprietors are projected to spend $900 million on production items, some $347 million more than in 1970 and 8 percent more than for Program A in 2020. The money spent on these production items will have a great impact on the economy of WRPA 2 by generating trade in area communities.

Earnings in forestry as a percent of total earnings in the area are the same as in Program A. Forest production is projected to increase 197 percent between 1970 and 2020.

## OUTLOOK FOR THE FUTURE

Figure 8 is a chart showing historical and projected gross product originating data by major industries for WRPA 2. It is expected that WRPA 2 will continue its transition from an extractive-based to a fabricative- and services-based economy. Agriculture will lose its role as the major basic or export industry to manufacturing. Manufacturing will be mainly represented by food and kindred products.

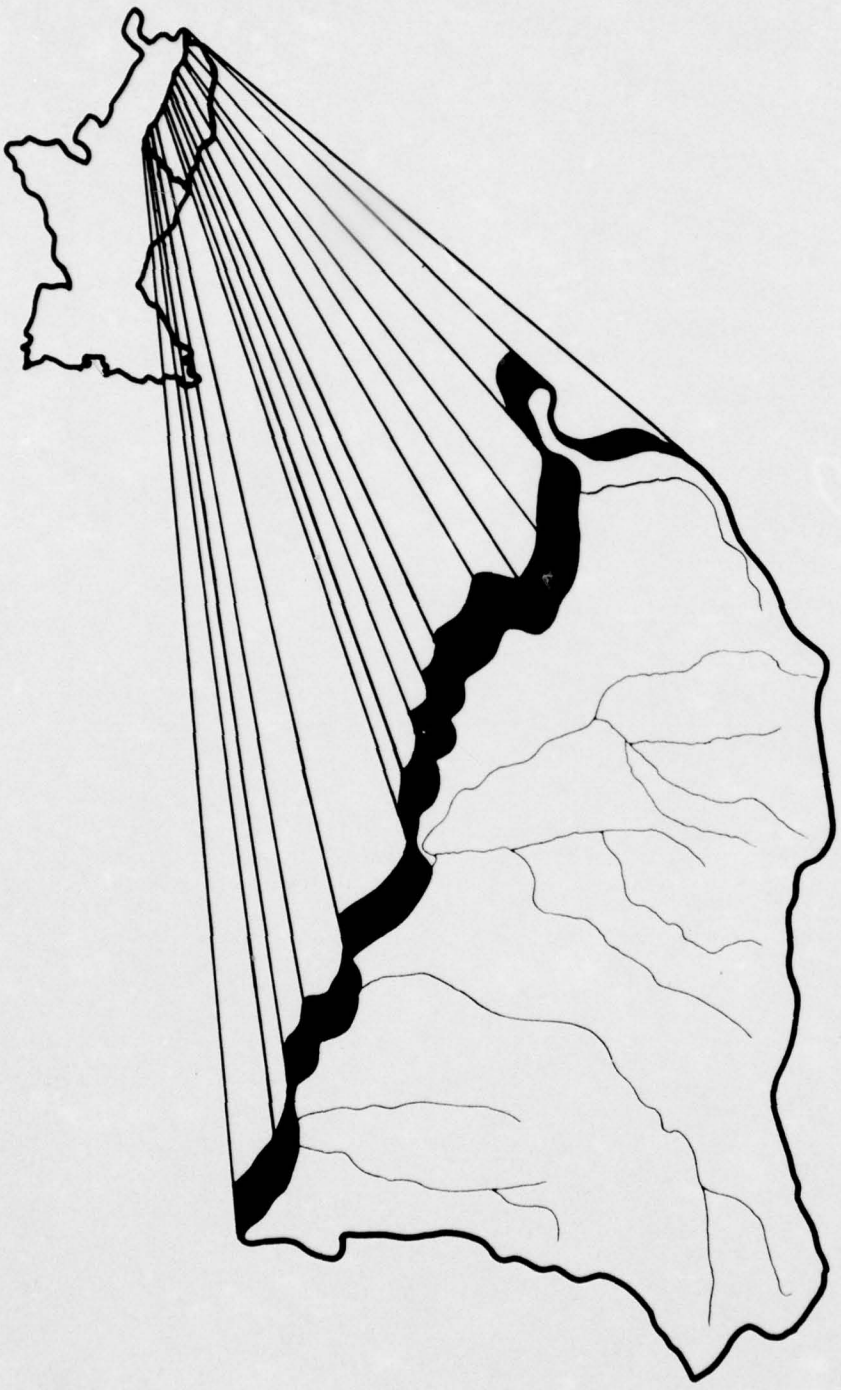
FIGURE 8




LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

HISTORICAL AND PROJECTED GROSS PRODUCT
ORIGINATING BY MAJOR INDUSTRIES

WRPA 2 PROGRAM B



# WRPA 3

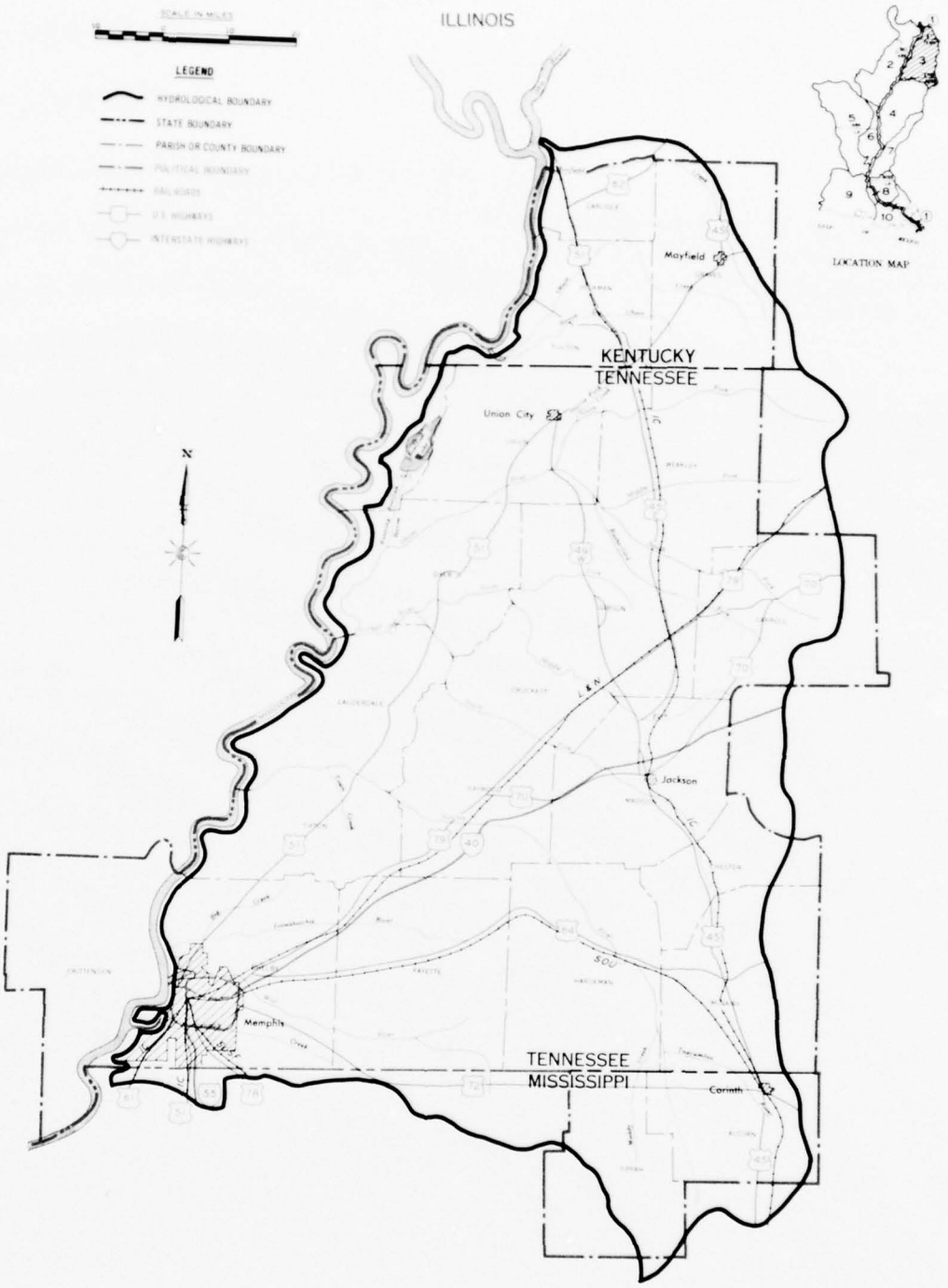
# WRPA 3, WEST KENTUCKY-WEST TENNESSEE

## PHYSICAL DESCRIPTION

WRPA 3 (figure 9) is based upon a hydrological area drained by Mayfield and Obion Creeks in Kentucky and the Obion, Forked Deer, Hatchie, Loosahatchie, and Wolf Rivers and Nonconnah Creek in Tennessee and Mississippi.

The western side of the area borders the Mississippi River, where there is a narrow band of alluvium. The remainder of the area is covered with loess or windblown origin soil. Except for the narrow band next to the Mississippi River, the topography is rolling. The elevation increases eastward from the Mississippi River. At the lower elevations, clearing has been generally accomplished, while at the higher elevations, clearing has not progressed as far. The highest elevations are characterized by a considerable amount of slope.

This WRPA is composed of 4 counties in southwestern Kentucky, 16 counties in western Tennessee, 1 in eastern Arkansas, and 2 in northeastern Mississippi.




LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

**WATER RESOURCE PLANNING**
**AREA 3**

FIGURE 9

## ECONOMIC DESCRIPTION

The economy of WRPA 3 is dominated by the economic structure of the Memphis Standard Metropolitian Statistical Area (SMSA) which functions as a well-diversified manufacturing center and a major distribution center for wholesale and retail trade. By definition the SMSA includes Crittenden County, Ark., which is included in the WRPA.

### Natural Resources

The natural resources of this area are the agricultural lands, which are well adapted to food crop production, the abundant rainfall, which is well distributed throughout the year, the mild climate, the long growing season, and the river transportation system.

Commercial forest land within the area amounts to 2,145,000 acres, almost 30 percent of the planning area. This area of commercial forest land includes an aggregate of 2,032,000 acres of privately-owned, and 113,000 acres of government-owned forests. National Forest System lands on the National Forests in Mississippi comprise 6 percent of all the public commercial forest land.

The forests of WRPA 3 have been typed into six major forest classifications which represent a broad spectrum of softwood and hardwood resources. The most common types are oak-hickory which occupies 47 percent and oak-gum-cypress which occupies 23 percent of the area.

### Industrial Development

Industrial development of this WRPA is centered within the Memphis SMSA (1970 population, 770,120). Other important centers of industrial development include the Tennessee cities of Jackson (39,996), Dyersburg (14,523), and Union City (11,925), and the Kentucky city of Mayfield (10,724).

Industries located in the Memphis SMSA are of a well-diversified nature. Many of the newer plants produce semifinished goods and materials, parts, and subassemblies that are shipped to final finishing and assembly plants in heavily industrialized regions of the Nation. The four smaller cities do not have the diversification of the Memphis SMSA, but each has evidenced the clustering effect which indicates the location of a natural development center. Each of the four cities also has many new industries.

The economic structure of WRPA 3 is more diversified than that of any other WRPA in the Lower Mississippi Region. In 1968, it

contributed the largest share of gross product originating from manufacturing in the region (see figure 10). It also contributed 27.5 percent of the total earnings generated by manufacturing in the region. Major manufacturing industries include apparel and other textiles, lumber and furniture, paper and allied products, and food and kindred products. In addition to manufacturing, agriculture and wholesale and retail trade are important economic activities in the industrial structure.

## Agricultural Development

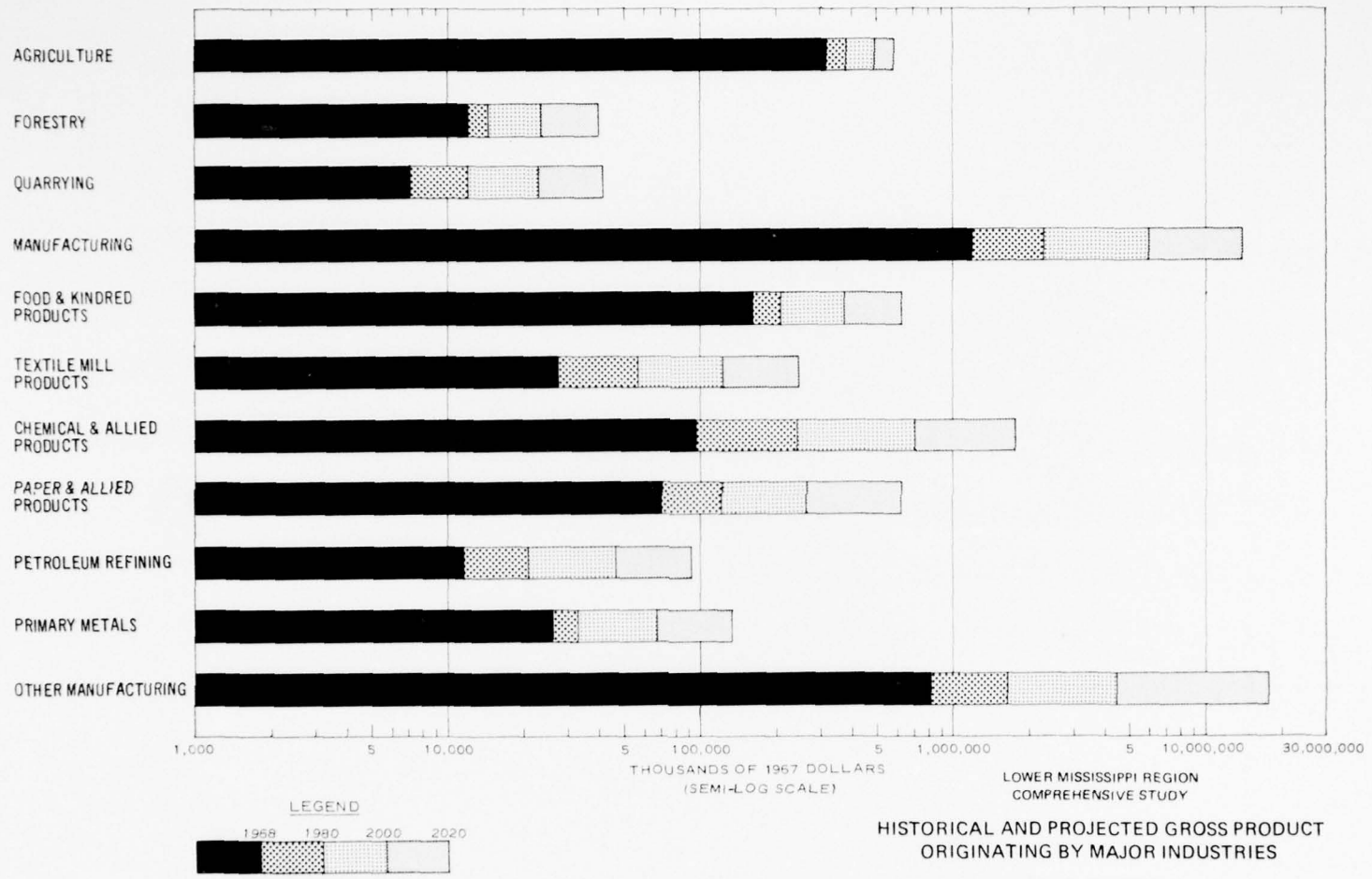
The agricultural development of this area is based primarily on the loess type soils outside the narrow band of alluvium. This type of soil, in addition to being suitable for the production of corn, cotton, soybeans, livestock, and small grains, is also well adapted to the raising of food crops. A recent growth trend has developed in the production, canning, and freezing of food crops. The finished product is consumed in the nearby large center of population and is also sold on the national market.

Seventy-one percent of the total area (5 million acres) was in farms in 1970; however, this was 14 percent less than in 1949. Most of the farms are commercial and produce a variety of crops and livestock products. Agricultural output from this area ranks third in the Lower Mississippi Region. Farms are relatively small and currently rank eighth in average size in the region. Farms are mostly the field crop type, with cotton the predominant crop. Prior to 1964, tenant farmers outnumbered other tenture groups; however, full owners outnumbered all other groups beginning in 1964.

In 1949, there were 78,533 farms in the area; however, in 1970 there were only 29,386, a decline of 63 percent. During the same period, amount of land in farms declined from 5.9 to 5.1 million acres, a decline of 14 percent. Average farm size increased from 75 acres in 1949 to 172 acres in 1970.

In 1970, the major crops produced in terms of acreage were cotton, soybeans, corn, and hay. These four crops accounted for 95 percent of the total harvested acreage. Practically all tobacco in the Lower Mississippi Region is grown in WRPA 3, almost half the barley and peanuts, and over one-third of the corn.

Livestock and poultry enterprises are not nearly so important as crop enterprises. However, in 1970 there were approximately 3,683 farms classified as livestock, dairy, and poultry farms. During the period 1949-1970, there was an upward trend in the sale of cattle and calves, chickens, eggs, and milk.




HISTORICAL AND PROJECTED GROSS PRODUCT ORIGINATING BY MAJOR INDUSTRIES

WRPA 3 PROGRAM B

FIGURE 10

In 1970, marketing receipts totaled $321.8 million. Field crops accounted for 76 percent of the total, and livestock and livestock products accounted for 24 percent. Total gross farm income was approximately $373.3 million, realized net income approximately $112.0 million, and derived net income per farm $3,811.

## HISTORICAL TRENDS

### Population

As shown in table 43, the population increased from 1,056,370 in 1950 to 1,246,294 in 1968. Most counties, except for the Memphis SMSA, lost population during the past two decades. During this period, there was a decrease in rural population and an increase in urban population. This shift in population was basically engendered by a change in orientation from an extractive-based to a fabricative- and services-based economy.

Table 43 - Economic Profile Summary for WRPA 3

| Parameter | Data for Indicated Years | | | | | |
|---|---|---|---|---|---|---|
| | 1950 | 1959 | 1968 | 1980 | 2000 | 2020 |
| Population (1 July) 1/ | | | | | | |
| Program A | 1,056,370 | 1,134,870 | 1,246,294 | 1,416,000 | 1,905,000 | 2,569,000 |
| Program B | -- | -- | -- | 1,555,000 | 2,166,000 | 2,983,000 |
| Personal Income 2/ | | | | | | |
| Program A | 1,540,330 | 1,962,936 | 3,266,826 | 5,499,000 | 13,545,000 | 32,557,000 |
| Program B | -- | -- | -- | 6,029,000 | 15,665,000 | 38,399,000 |
| Per Capita 2/ | | | | | | |
| Program A | 1,458 | 1,730 | 2,621 | 3,884 | 7,108 | 12,672 |
| Program B | -- | -- | -- | 3,900 | 7,200 | 12,900 |
| Earnings 2/ | | | | | | |
| Total, Program A | 1,282,376 | 1,637,324 | 2,689,872 | 4,446,000 | 10,641,000 | 24,921,000 |
| Total, Program B | -- | -- | -- | 4,874,000 | 12,306,000 | 29,393,000 |
| Per Worker 2/ | | | | | | |
| Program A | 3,303 | 4,065 | 5,487 | 7,864 | 13,850 | 24,041 |
| Program B | -- | -- | -- | 7,864 | 13,850 | 24,041 |
| Employment | | | | | | |
| Total, Program A | 388,216 | 402,741 | 490,191 | 565,394 | 768,000 | 1,037,000 |
| Total, Program B | -- | -- | -- | 620,000 | 888,000 | 1,223,000 |
| Gross Manufacturing Product 2/ | | | | | | |
| Total, Program A | -- | -- | 1,200,606 | 2,108,000 | 5,189,000 | 12,181,000 |
| Total, Program B | -- | -- | -- | 2,316,000 | 6,001,000 | 14,366,000 |
| Gross Farm Marketing Receipts 2/ | | | | | | |
| Total, Program A | -- | -- | 321,750+ | 389,000 | 464,000 | 546,000 |
| Total, Program B | -- | -- | -- | 389,000 | 500,000 | 591,000 |

1/ U. S. Bureau of Census figures show the 1970 population of WRPA 3 as 1,258,009.
2/ Personal income, total earnings, gross manufacturing product, and gross farm marketing receipt data are given in thousands of 1967 dollars; per capita income and per worker earnings are given in 1967 dollars.



Memphis as seen from the river



Cargo ship in Memphis harbor



McKellar Lake, Presidents Island, and Pidgeon Industrial Park, Memphis

## Employment

Total employment increased from 388,216 in 1950 to 402,741 in 1960 and 490,191 in 1968. An analysis of the changes in the employment pattern shows that agricultural employment, which was 98,400 (25 percent of total employment) in 1950, decreased to 53,174 in 1960 (13 percent of total). During the same period, manufacturing employment increased from 61,435 (16 percent of total employment) to 79,989 (20 percent of total). Food and kindred products contributed most to manufacturing employment. As of early 1972, 9 of the 23 counties in the area were eligible for assistance under the Economic Development Act.

## Personal and Per Capita Income

Table 43 shows that personal income increased from $1.5 billion in 1950 to $3.3 billion in 1968, an increase of 112 percent. During the same period, population increased from 1,056,370 to 1,246,294, an increase of 18 percent. These different trend rates resulted in an increase in per capita income which was $1,458 in 1950 and $2,621 in 1968. The increase in per capita income was 80 percent. Compared with per capita income of the United States, this area's per capita income was 70 percent in 1950 and 79 percent in 1968.

## ECONOMIC PROBLEMS

As of January 1972, 9 of the 23 counties in WRPA 3 were designated as eligible for assistance under the Public Works and Economic Development Act of 1965. Under this act, qualified areas can obtain public works grants and loans and business development loans designed to create new jobs and stimulate economic growth. Criteria for an eligibility designation includes persistently high rates of unemployment, substantial population loss, and/or low median family income levels.

WRPA 3 is dominated by the Memphis SMSA, which has experienced low rates of unemployment relative to the national average. Many of the existing jobs are in low-wage activities resulting in low average incomes. Per capita incomes in the WRPA area are about 80 percent of the national average. The area would benefit if it were able to attract higher wage capital-intensive industries.

## PROGRAM A, NATIONAL INCOME

Under Program A, it is forecast that population, employment, personal income, and earnings in WRPA 3 will grow at a slightly faster rate than in the United States as a whole.

Table 43 indicates that from 1968 to 2020 the area population will grow at an annual rate of 1.41 percent, or from 1.2 million to 2.6 million, for an overall increase of 106 percent. In comparison, the United States, for the same period, will grow at an annual rate of 1.34 percent, with an overall total increase of 100 percent.

Employment will increase from 490,191 in 1968 to 1,037,000 in 2020 (table 45). This increase is at an annual rate of 1.44 percent, for an overall increase of 112 percent. During the same period, employment in the United States will increase at an annual rate of 1.41 percent, for a total increase of 109 percent. An analysis of the trends in employment from 1960 to 2020 shows agricultural employment decreasing 71 percent and manufacturing employment increasing 208 percent. During the same period in the United States, agricultural employment will decline 59 percent, and manufacturing employment will increase 215 percent. The largest segments of manufacturing will be the chemical and allied products, paper and allied products, and food and kindred products industries. Employment will increase in each of the major water-using industries except the food and kindred products industry. The most dramatic increase in employment will occur in the chemical and allied products industry (table 45).

Personal income is forecast to increase from $3.3 billion in 1968 to $32.6 billion in 2020. This is an increase of 897 percent, as measured in 1967 constant dollars. The increase for the whole of the United States over this period is forecast to be 863 percent.

Income per person in WRPA 3 will increase from $2,621 in 1968 to $12,672 (1967 dollars) in 2020. This represents an increase of 383 percent in the area, as compared with an increase of 332 percent for the United States. In 1968, per capita income was 79 percent as great as the United States per capita income; by 2020, it is expected to increase to 89 percent of the national per capita income.

Total earnings are forecast to increase 461 percent from 1980 to 2020; per worker earnings are expected to increase 206 percent (table 44). During the same period in the United States, total and per worker earnings are expected to increase 493 and 283 percent, respectively. Per worker earnings will increase from 84 percent of the United States average in 1980 to 90 percent in 2020.

Production of all agricultural crops except oats and rye is

Table 44 - Earnings by Major Industries, WRPA 3
West Kentucky-West Tennessee

| Industry | Thousands of 1967 Dollars | | | | | |
|---|---|---|---|---|---|---|
| | 1950 | 1959 | 1968 | 1980 | 2000 | 2020 |
| Total Program A | 1,282,376 | 1,637,324 | 2,689,872 | 4,446,000 | 10,641,000 | 24,921,000 |
| Total Program B | -- | -- | -- | 4,874,000 | 12,306,000 | 29,393,000 |
| Per Worker | | | | | | |
| Program A (Dollars) | 3,303 | 4,065 | 5,487 | 7,864 | 13,850 | 24,041 |
| Program B (Dollars) | -- | -- | -- | 7,864 | 13,850 | 24,041 |
| Agriculture | | | | | | |
| Program A | 206,295 | 174,240 | 176,327 | 137,000 | 171,000 | 298,000 |
| Program B | -- | -- | -- | 151,000 | 198,000 | 351,000 |
| Forestry & Fisheries | | | | | | |
| Program A | 487 | 405 | 410 | 1,100 | 2,200 | 4,200 |
| Program B | -- | -- | -- | 1,200 | 3,000 | 5,000 |
| Mining | | | | | | |
| Program A | 1,734 | 3,334 | 4,232 | 6,200 | 11,000 | 20,000 |
| Program B | -- | -- | -- | 7,000 | 13,000 | 23,000 |
| Manufacturing | | | | | | |
| Program A | 240,879 | 355,199 | 702,074 | 1,162,000 | 2,677,000 | 6,017,000 |
| Program B | -- | - | - | 1,274,000 | 3,096,000 | 7,096,000 |
| Food & Kindred Products | | | | | | |
| Program A | 44,375 | 68,644 | 92,062 | 107,000 | 172,000 | 288,000 |
| Program B | -- | -- | -- | 118,000 | 199,000 | 339,000 |
| Textile Mill Products | | | | | | |
| Program A | 16,019 | 13,628 | 19,525 | 37,000 | 76,000 | 150,000 |
| Program B | -- | -- | -- | 41,000 | 88,000 | 177,000 |
| Chemical & Allied Products | | | | | | |
| Program A | 10,194 | 20,891 | 42,098 | 90,000 | 223,000 | 521,000 |
| Program B | -- | -- | -- | 99,000 | 258,000 | 615,000 |
| Paper & Allied Products | | | | | | |
| Program A | 10,269 | 25,255 | 40,446 | 64,000 | 142,000 | 311,000 |
| Program B | -- | -- | -- | 70,000 | 164,000 | 367,000 |
| Petroleum Refining | | | | | | |
| Program A | 1,581 | 2,766 | 5,055 | 8,000 | 16,000 | 30,000 |
| Program B | -- | -- | -- | 9,000 | 18,000 | 35,000 |
| Primary Metals | | | | | | |
| Program A | 976 | 6,210 | 13,848 | 19,000 | 38,000 | 74,000 |
| Program B | -- | -- | -- | 21,000 | 44,000 | 87,000 |
| Other Manufacturing | | | | | | |
| Program A | 157,465 | 217,805 | 489,040 | 837,000 | 2,009,000 | 4,643,000 |
| Program B | -- | -- | -- | 916,000 | 2,323,000 | 5,476,000 |
| All Other | | | | | | |
| Program A | 832,980 | 1,104,146 | 1,806,830 | 3,140,000 | 7,780,000 | 18,582,000 |
| Program B | -- | -- | -- | 3,441,000 | 8,996,000 | 21,918,000 |

Table 45 - Employment by Major Industries in WRPA 3

| Industry | Number of People Employed in Indicated Years | | | | |
|---|---|---|---|---|---|
| | 1950 | 1960 | 1980 | 2000 | 2020 |
| Total, Program A | 388,216 | 402,741 | 565,400 | 768,000 | 1,037,000 |
| Total, Program B | -- | -- | 620,000 | 888,000 | 1,223,000 |
| Agriculture | | | | | |
| Program A | 98,400 | 53,174 | 18,000 | 13,000 | 12,000 |
| Program B | -- | -- | 18,000 | 14,000 | 13,000 |
| Forestry & Fisheries | | | | | |
| Program A | 258 | 131 | 120 | 140 | 160 |
| Program B | -- | -- | 130 | 160 | 190 |
| Mining | | | | | |
| Program A | 365 | 472 | 610 | 680 | 690 |
| Program B | -- | -- | 670 | 790 | 810 |
| Manufacturing | | | | | |
| Program A | 61,435 | 79,989 | 146,000 | 192,000 | 246,000 |
| Program B | -- | -- | 160,000 | 222,000 | 291,000 |
| Food & Kindred Products | | | | | |
| Program A | 8,124 | 12,652 | 13,000 | 13,000 | 13,000 |
| Program B | -- | -- | 14,000 | 14,600 | 15,000 |
| Textile Mill Products | | | | | |
| Program A | 4,223 | 3,630 | 5,400 | 6,300 | 6,700 |
| Program B | -- | -- | 6,000 | 7,300 | 8,000 |
| Chemical & Allied Products | | | | | |
| Program A | 4,236 | 4,844 | 11,000 | 15,600 | 21,000 |
| Program B | -- | -- | 12,000 | 18,100 | 25,000 |
| Paper & Allied Products | | | | | |
| Program A | 1,400 | 3,449 | 5,500 | 7,900 | 11,000 |
| Program B | -- | -- | 6,100 | 9,100 | 13,000 |
| Petroleum Refining | | | | | |
| Program A | 475 | 540 | 1,000 | 1,100 | 1,200 |
| Program B | -- | -- | 1,100 | 1,300 | 1,400 |
| Primary Metals | | | | | |
| Program A | 441 | 1,180 | 2,000 | 2,500 | 2,800 |
| Program B | -- | -- | 2,200 | 2,900 | 3,300 |
| Other Manufacturing | | | | | |
| Program A | 42,536 | 53,694 | 108,100 | 146,000 | 191,000 |
| Program B | -- | -- | 118,000 | 169,000 | 226,000 |
| All Other | | | | | |
| Program A | 228,016 | 269,106 | 401,000 | 562,000 | 777,000 |
| Program B | -- | -- | 441,030 | 651,000 | 918,000 |

projected to increase between 1970 and 2020. Large increases are projected for sorghum, wheat, peanuts, soybeans, and rice. Livestock numbers and livestock products are projected to increase in all categories. Certain expenditures will have to be made by farm proprietors in WRPA 3 to achieve this production, and these expenditures will in themselves generate added economic activity. It is projected that by 2020, WRPA 3 farm proprietors will spend $445 million on production items, approximately $184 million more than in 1970. The money spent on these items will have some impact on the economy of WRPA 3 by generating trade in both small and large communities.

Although the percentages of forestry earnings and employment are projected to decline, forestry output is projected to increase 40 percent between 1970 and 2020.

## PROGRAM B, REGIONAL DEVELOPMENT

Under Program B, accelerated regional development, population is forecast to grow at an annual rate of 1.7 percent to 3.0 million, for an overall increase of 139 percent. Employment will grow at 1.8 percent annually to 1.2 million employed, for an overall increase of 150 percent. Earnings will grow annually at 4.8 percent to $29.4 billion, an overall increase of 993 percent.

Personal income will increase from $3.3 billion in 1968 to $38.4 billion in 2020. This represents an annual growth of 5.0 percent and a total increase of 1,075 percent. Per capita income will increase to $12,900, rising more rapidly toward the national average. In 1968, per capita income in WRPA 3 was 79 percent as great as the United States average; in 1980 it will be 82 percent as great and in 2020, 91 percent as great.

Agricultural production is projected to increase 83 percent between 1970 and 2020, some 13 percent more than for Program A (table 48). The levels of agricultural output are the same for Programs A and B in the year 1980. However, for the years 2000 and 2020, the level of agricultural output will increase as a result of the assumptions made regarding Program B. Certain expenditures will have to be made by farm proprietors in WRPA 3 to achieve the projected level of production. By 2020, WRPA 3 farm proprietors are projected to spend $481 million on production items, some $220 million more than in 1970 and 8 percent more than for Program A in 2020. The money spent on these production items will have an impact on the economy of WRPA 3 by generating trade in both large and small communities.

Forest production is projected to increase 232 percent between 1970 and 2020.

Table 46 - Gross Product Originating by Major Industries
WRPA 3, West Kentucky-West Tennessee

| Industry | Thousands of 1967 Dollars | | | | |
|---|---|---|---|---|---|
| | 1967 | 1968 | 1980 | 2000 | 2020 |
| Agriculture 1/ | | | | | |
| Program A | -- | 321,750 2/ | 389,000 | 464,000 | 546,000 |
| Program B | -- | -- | 389,000 | 500,000 | 591,000 |
| Forestry 1/ | | | | | |
| Program A | -- | 12,100 2/ | 11,800 | 17,800 | 20,100 |
| Program B | -- | -- | 14,800 | 23,700 | 40,500 |
| Mining, Petroleum | | | | | |
| Program A | D 3/ | D 3/ | (Included in higher totals.) | | |
| Program B | | | | | |
| Quarrying | | | | | |
| Program A | 7,451 | 7,153 | 11,000 | 20,000 | 37,000 |
| Program B | -- | -- | 12,000 | 23,000 | 43,000 |
| Manufacturing | | | | | |
| Program A | 1,092,477 | 1,212,649 | 2,108,000 | 5,189,000 | 12,181,000 |
| Program B | -- | -- | 2,316,000 | 6,001,000 | 14,366,000 |
| Food & Kindred Products | | | | | |
| Program A | 149,537 | 162,995 | 196,000 | 322,000 | 543,000 |
| Program B | -- | -- | 215,000 | 372,000 | 640,000 |
| Textile Mill Products | | | | | |
| Program A | 27,278 | 27,005 | 52,000 | 106,000 | 210,000 |
| Program B | -- | -- | 57,000 | 123,000 | 247,000 |
| Chemical & Allied Products | | | | | |
| Program A | 88,382 | 97,220 | 222,000 | 614,000 | 1,564,000 |
| Program B | -- | -- | 243,000 | 710,000 | 1,845,000 |
| Paper & Allied Products | | | | | |
| Program A | 63,419 | 70,395 | 112,000 | 247,000 | 542,000 |
| Program B | -- | -- | 122,000 | 286,000 | 639,000 |
| Petroleum Refining | | | | | |
| Program A | 8,836 | 11,398 | 19,000 | 40,000 | 78,000 |
| Program B | -- | -- | 21,000 | 47,000 | 93,000 |
| Primary Metals | | | | | |
| Program A | 17,763 | 20,605 | 30,000 | 59,000 | 114,000 |
| Program B | -- | -- | 33,000 | 68,000 | 134,000 |
| Other Manufacturing | | | | | |
| Program A | 737,262 | 823,031 | 1,477,000 | 3,901,000 | 9,130,000 |
| Program B | -- | -- | 1,625,000 | 4,392,000 | 10,768,000 |

1/ Marketing receipts.
2/ 1970 data.
3/ D—Deleted to avoid disclosure of confidential data.

Table 47 - Index of Output by Major Industries, WRPA 3
West Kentucky-West Tennessee (1967 = 100)

| Industry | 1967 | 1968 | 1980 | 2000 | 2020 |
|---|---|---|---|---|---|
| Agriculture | | | | | |
| Program A | -- | 100 1/ | 121 | 144 | 170 |
| Program B | -- | -- | 121 | 155 | 183 |
| Forestry | | | | | |
| Program A | -- | 100 1/ | 98 | 147 | 166 |
| Program B | -- | -- | 122 | 196 | 335 |
| Mining, Petroleum | | | | | |
| Program A | -- | -- | -- | -- | -- |
| Program B | -- | -- | -- | -- | -- |
| Quarrying | | | | | |
| Program A | 100 | 96 | 151 | 268 | 491 |
| Program B | -- | -- | 166 | 310 | 579 |
| Manufacturing | | | | | |
| Program A | 100 | 111 | 193 | 475 | 1,115 |
| Program B | -- | -- | 212 | 549 | 1,315 |
| Food & Kindred Products | | | | | |
| Program A | 100 | 109 | 131 | 215 | 363 |
| Program B | -- | -- | 144 | 249 | 428 |
| Textile Mill Products | | | | | |
| Program A | 100 | 99 | 192 | 390 | 769 |
| Program B | -- | -- | 211 | 451 | 907 |
| Chemical & Allied Products | | | | | |
| Program A | 100 | 110 | 251 | 695 | 1,770 |
| Program B | -- | -- | 275 | 804 | 2,088 |
| Paper & Allied Products | | | | | |
| Program A | 100 | 111 | 176 | 390 | 854 |
| Program B | -- | -- | 193 | 451 | 1,007 |
| Petroleum Refining | | | | | |
| Program A | 100 | 129 | 214 | 458 | 888 |
| Program B | -- | -- | 235 | 530 | 1,047 |
| Primary Metals | | | | | |
| Program A | 100 | 116 | 167 | 332 | 639 |
| Program B | -- | -- | 183 | 384 | 754 |
| Other Manufacturing | | | | | |
| Program A | 100 | 112 | 200 | 529 | 1,238 |
| Program B | -- | -- | 220 | 596 | 1,461 |

1/ 1970 used as base.

Table 48 - Agricultural Production, Crop and Livestock, WRPA 3
West Kentucky-West Tennessee

| Industry | Unit | 1959 | 1970 | 1980 | 2000 | 2020 |
|---|---|---|---|---|---|---|
| | | | Crop | | | |
| Cotton | Bales | | | | | |
| Program A 1/ | | 690,851 | 691,975 | 831,000 | 903,000 | 975,000 |
| Program B 1/ | | -- | -- | 831,000 | 970,000 | 1,047,000 |
| Corn | Bushels | | | | | |
| Program A | | 23,504,340 | 15,000,000 | 11,230,000 | 15,523,000 | 18,568,000 |
| Program B | | -- | -- | 11,230,000 | 16,675,000 | 19,939,000 |
| Sorghum | Bushels | | | | | |
| Program A | | 400,587 | 165,000 | 409,000 | 525,000 | 728,000 |
| Program B | | -- | -- | 409,000 | 564,000 | 782,000 |
| Oats | Bushels | | | | | |
| Program A | | 520,789 | 630,000 | 578,000 | 597,000 | 619,000 |
| Program B | | -- | -- | 578,000 | 642,000 | 665,000 |
| Rice | Bushels | | | | | |
| Program A | | 337,432 | 672,768 | 987,000 | 1,164,000 | 1,385,000 |
| Program B | | -- | -- | 987,000 | 1,251,000 | 1,488,000 |
| Irish Potatoes | Bushels | | | | | |
| Program A | | 167,146 | 42,000 | 39,000 | 51,000 | 66,000 |
| Program B | | -- | -- | 39,000 | 55,000 | 71,000 |
| Sweet Potatoes | Bushels | | | | | |
| Program A | | 671,253 | 315,000 | 245,000 | 255,000 | 319,000 |
| Program B | | -- | -- | 245,000 | 274,000 | 343,000 |
| Tobacco | Pounds | | | | | |
| Program A | | 6,775,920 | 13,516,800 | 12,364,000 | 14,257,000 | 16,108,000 |
| Program B | | -- | -- | 12,364,000 | 15,315,000 | 17,298,000 |
| Sugarcane | Tons | | | | | |
| Program A | | 0 | 0 | 0 | 0 | 0 |
| Program B | | -- | -- | 0 | 0 | 0 |
| Wheat | Bushels | | | | | |
| Program A | | 1,045,391 | 1,369,980 | 2,490,000 | 2,980,000 | 3,305,000 |
| Program B | | -- | -- | 2,490,000 | 3,201,000 | 3,549,000 |
| Soybeans | Bushels | | | | | |
| Program A | | 11,588,305 | 19,231,674 | 29,161,000 | 35,938,000 | 42,130,000 |
| Program B | | -- | -- | 29,161,000 | 38,607,000 | 45,243,000 |

1/ Program A incorporates 1970 production estimates. Program B reflects the projected national growth rate shown in Table II-3, Selected Agricultural Products, pages II-18 through II-22, Volume 1, Economic Activity in the United States by Water Resource Regions and Subareas, Historical and Projected, 1929-2020, United States Water Resources Council, April 1971.

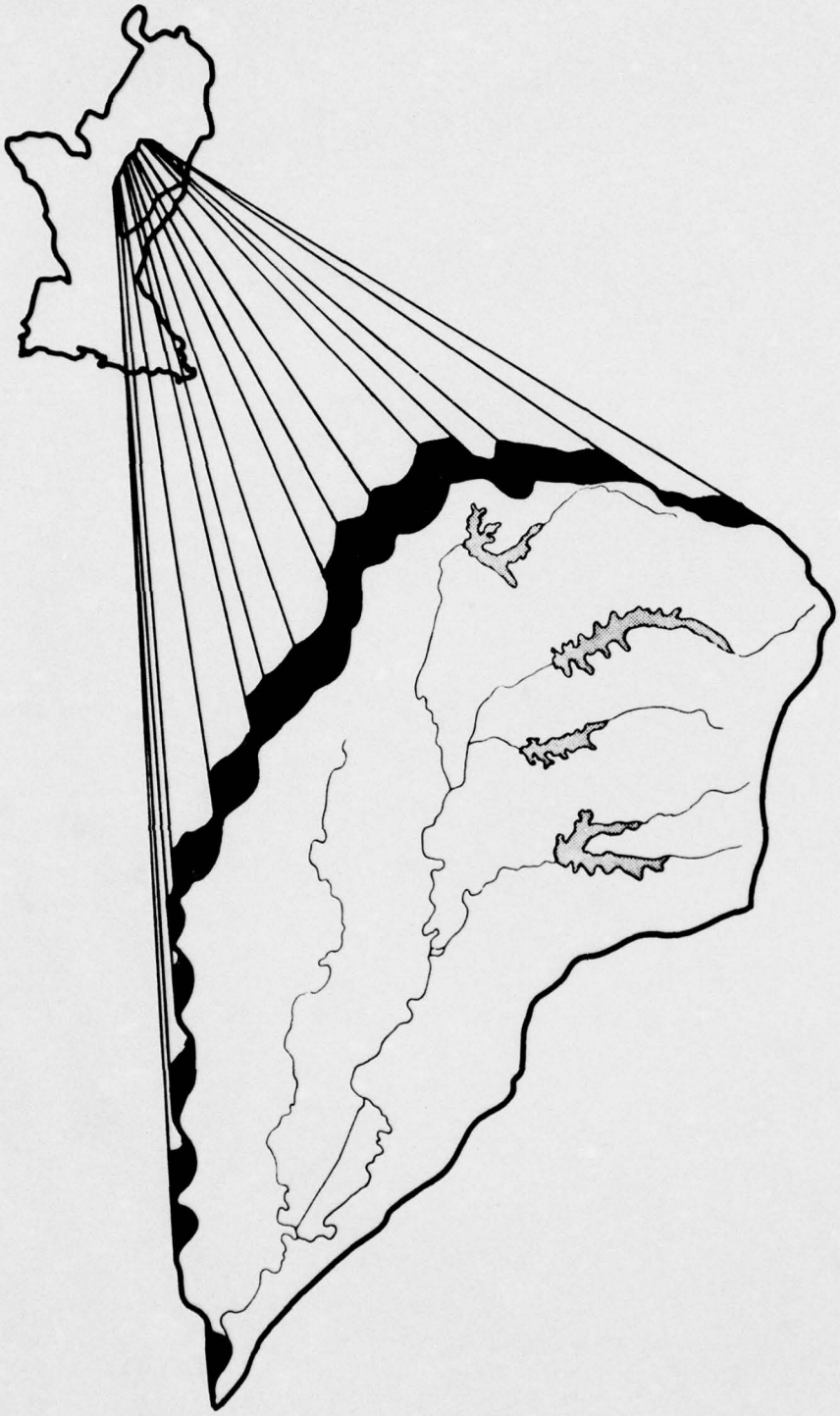
Table 48 - Agricultural Production, Crop and Livestock, WRPA 3
West Kentucky-West Tennessee (Con.)

| Industry | Unit | 1959 | 1970 | 1980 | 2000 | 2020 |
|---|---|---|---|---|---|---|
| | | | Crop (Con.) | | | |
| Forest Products | Thousand | | | | | |
| Program A | Cubic | -- | 36,000 | 36,000 | 54,000 | 61,000 |
| Program B | Feet | -- | -- | 45,000 | 72,000 | 123,000 |
| Hay | Tons | | | | | |
| Program A | | 299,051 | 327,611 | 431,000 | 532,000 | 656,000 |
| Program B | | -- | -- | 431,000 | 572,000 | 705,000 |
| Gross Value of Crops | Thousand 1967 | | | | | |
| Program A | Dollars | 169,872 | 246,782 | 282,000 | 324,000 | 364,000 |
| Program B | | -- | -- | 282,000 | 350,000 | 395,000 |
| | | | Livestock Thousands 2/ | | | |
| Beef | Pounds | | | | | |
| Program A | | -- | 148,388 | 188,930 | 254,311 | 341,534 |
| Program B | | -- | -- | 188,930 | 273,191 | 366,766 |
| Pork | Pounds | | | | | |
| Program A | | -- | 168,706 | 192,712 | 251,718 | 326,752 |
| Program B | | -- | -- | 192,712 | 270,406 | 350,893 |
| Lamb | Pounds | | | | | |
| Program A | | -- | 295 | 226 | 266 | 327 |
| Program B | | -- | -- | 226 | 286 | 351 |
| Chickens | Pounds | | | | | |
| Program A | | -- | 9,392 | 13,063 | 18,240 | 24,488 |
| Program B | | -- | -- | 13,063 | 19,594 | 26,297 |
| Turkeys | Pounds | | | | | |
| Program A | | -- | 464 | 619 | 871 | 1,176 |
| Program B | | -- | -- | 619 | 936 | 1,263 |
| Eggs | Dozen | | | | | |
| Program A | | -- | 27,575 | 30,294 | 38,778 | 49,120 |
| Program B | | -- | -- | 30,294 | 41,657 | 52,749 |
| Milk | Pounds | | | | | |
| Program A | | -- | 293,736 | 270,130 | 333,410 | 407,182 |
| Program B | | -- | -- | 270,130 | 358,162 | 437,265 |
| Gross Value of Livestock | 1967 Dollars | | | | | |
| Program A | | 53,846 | 74,968 | 106,804 | 139,940 | 182,382 |
| Program B | | -- | -- | 106,804 | 150,330 | 195,858 |

2/ Net liveweight production.

## OUTLOOK FOR THE FUTURE

It is expected that WRPA 3 will continue its transition to a highly developed urban economy oriented toward fabricative- and service-based industries. Manufacturing will be especially represented by chemicals, paper and allied products, and food and kindred products. The Memphis SMSA will continue to grow at rates in excess of the national average. Immigration from the adjoining rural counties in Mississippi, Tennessee, and Arkansas will continue to augment the labor supply as long as sufficient job opportunities are available. By 2020, the WRPA will have 88 percent of its population classified as urban, more than any other WRPA in the Region. In terms of growth of population and economic activity, it will rank first among WRPA's of the LMR. In terms of absolute magnitudes of population and economy activity measures, it will rank alongside WRPA 10 (New Orleans). Because the economic base of the WRPA is so well diversified, its economy will be influenced less than that of the other WRPA's by the swings of the business cycle.



# WRPA 4

# W R P A  4 ,  Y A Z O O

## PHYSICAL DESCRIPTION

WRPA 4, based on county boundaries (figure 11), comprises 15,240 square miles in the northwest part of the State of Mississippi. Approximately half of this area is in the alluvial valley of the Mississippi River. The other half consists of rolling to rugged hill land. The Yazoo Headwater, Sunflower, and Yazoo Backwater are the three major basins within the WRPA.

The Yazoo Headwater area is that portion of the Yazoo River drainage area above Yazoo City, Miss., comprising approximately 2,300 square miles in the alluvial valley and 6,600 square miles of hill lands. The Yazoo, Tallahatchie, and Coldwater Rivers form the main stem of the drainage system. The principal hill tributaries in the headwater area are the Little Tallahatchie, Yocona, and Yalobusha Rivers, and the principal floodplain tributaries are Cassidy Bayou and Tchula Lake.

The Sunflower River Basin comprises approximately 4,100 square miles in the northwest portion of Mississippi bordering the east-bank levee of the Mississippi River. The basin is about 140 miles long in a north-south direction, with an average width of about 30 miles. The area lies west of Cassidy Bayou and the Tallahatchie and Yazoo Rivers and extends from the vicinity of Clarksdale, Miss., to the confluence of the Yazoo River and Steele Bayou, about 10 miles north of Vicksburg, Miss. The topography is flat, with an average slope from north to south of about 0.5 ft/mile. The two major drainage outlets are Big Sunflower River, with a drainage area of 3,100 square miles, and Steele Bayou, with a drainage area of 700 square miles. The watersheds of Deer Creek and Little Sunflower River are connected by Rolling Fork Creek. Little Sunflower River is a tributary of the Big Sunflower River.

The Yazoo Backwater area is that area of west-central Mississippi lying between the east-bank Mississippi River levee and the hills, and is subject to flooding from the Mississippi River by backwater through the opening between the end of the main line Mississippi River levee and the hills just north of Vicksburg. This area comprises about 1,550 square miles of typical alluvial valley lands. East of the Yazoo River, within the limits of the backwater area, both hill and floodplain areas consisting of approximately 271 square miles are also drained into the Yazoo River.




LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

**WATER RESOURCE PLANNING**
**AREA 4**

FIGURE 11

## ECONOMIC DESCRIPTION

### Natural Resources

WRPA 4, for economic purposes, comprises 9,753,600 acres. Agricultural lands comprise 8,972,507 acres, 78 percent of which are in farms and 22 percent of which are in forest and other uses. Nonagricultural lands comprise 581,114 acres, of which 17 percent is Federal, 56 percent urban and built-up, and 27 percent in small bodies of water. The remaining 199,979 acres are in large bodies of water.

Fertile agricultural land is one of the most valuable resources of this area. Principal crops are cotton, soybeans, corn, small grains (including rice in some areas), and pasture. Beef cattle farming is increasing rapidly throughout the area.

Commercial forest lands cover 3.4 million acres, or approximately 35 percent of the WRPA. Oak-hickory timber occupies 38 percent of the forest area, and oak-gum cypress occupies 28 percent of the forest area. Timber, which in total occupies 36 percent of the area, is an important resource in much of the hill area and in the lower bottomlands.

Value of mineral production in WRPA 4 in 1968 exceeded $10 million. Petroleum, sand, gravel, natural gas, and clays comprised most of the total value. Almost 78 percent of the total was attributable to petroleum, sand and gravel, and natural gas production in Yazoo County.

All game species common to Mississippi are found in this region. The pine and mixed hardwood forests of the upland area and the bottomland hardwoods of the alluvial delta area support good populations of deer, wild turkeys, and small forest game and nongame wildlife species. Agricultural lands are hunted for upland game birds and cottontail rabbits.

The streams and natural lakes of the delta area as well as the farm ponds and four large man-made lakes in the upland area provide excellent sport and commercial fishing opportunities. Largemouth bass, spotted bass, white bass, white crappie, bluegill, and catfish are the most important game fish. Catfish and buffalo fish are the major commercial species.

Migratory waterfowl are seasonally abundant on the four large lakes in the uplands and on the natural lakes of the delta. Large numbers of these migrant waterfowl are attracted to flooded forest areas during the fall and winter months. Wood ducks are year-round residents of the forest areas near permanent water.

## Industrial Development

In 1967, there were 569 manufacturing establishments in the area with a combined payroll of $156.6 million. These firms employed 34,200 people, 28,200 of whom were production workers. Forty-one percent of the establishments employed 20 or more workers, while 16 percent had more than 100 employees. The value added by manufacturing increased 69 percent between 1963 and 1967 in WRPA 4.

The value of gross production by manufacturing in 1968 was $330.7 million, an increase of 8 percent over 1967 (see tables 49 and 50). Figure 12 is a chart showing historical and projected gross product originating data by major industries for WRPA 4. In 1968, the major water-using manufacturing industries were the chemical and allied products, food and kindred products, and textile industries. These industries accounted for almost a third of the gross product by manufacturing.

Manufacturing earnings accounted for over 21 percent of total earnings in WRPA 4 in 1968. The largest contributors to total manufacturing earnings by major water-using manufacturing industries were the textile mills products industry (10.0 percent), food and kindred products industry (8.3 percent), and the chemical and allied products industry (7.1 percent). Other manufacturing accounted for almost three-fourths of total manufacturing earnings. The lumber and furniture industry contributed 18.3 percent of the other manufacturing earnings; machinery manufacturing was second with 17.1 percent, and apparel production followed with 10.2 percent.

## Agricultural Development

As noted previously, fertile agricultural land is one of the most valuable resources of WRPA 4. Agriculture, in turn, is the most important part of the area's economy, as is reflected in earnings and employment values for the area (see tables 51 and 52). For example, agricultural earnings of $249.3 million in 1959 represented 36.6 percent of total earnings. These earnings increased to $258.9 million in 1968. Although agricultural employment declined due to substantial mechanization, it accounted for 36.3 percent of total employment in WRPA 4 in 1960, the largest contribution to total employment by a single industry.

Land in farms accounted for 71.8 percent of the land area in WRPA 4 in 1970, 8 percent less than in 1949. A continuation of this downward trend is anticipated in the future. More dramatic changes occurred in the number of farms in the area, as reflected in the 50 percent decrease in number of farms between 1959 and 1970. Although the number of farms

Table 49 - Gross Product Originating by Major Industries in WRPA 4

| Industry | Gross Product Originating in Indicated Years thousands of 1967 dollars | | | | |
|---|---|---|---|---|---|
| | 1967 | 1968 | 1980 | 2000 | 2020 |
| Agriculture 1/ | | | | | |
| Program A | -- | 499,785 2/ | 684,000 | 791,000 | 899,000 |
| Program B | -- | -- | 684,000 | 854,000 | 977,000 |
| Forestry 3/ | | | | | |
| Program A | -- | 15,100 2/ | 13,000 | 20,900 | 22,400 |
| Program B | -- | -- | 16,500 | 28,200 | 40,500 |
| Mining, Petroleum | | | | | |
| Program A | 8,314 | 5,820 | 9,000 | 12,000 | 21,000 |
| Program B | -- | -- | 9,000 | 14,000 | 24,000 |
| Quarrying | | | | | |
| Program A | 4,272 | 4,443 | 6,000 | 10,000 | 17,000 |
| Program B | -- | -- | 7,000 | 12,000 | 21,000 |
| Manufacturing | | | | | |
| Program A | 306,218 | 330,715 | 591,000 | 1,494,000 | 3,543,000 |
| Program B | -- | -- | 648,000 | 1,728,000 | 4,179,000 |
| Food & Kindred Products | | | | | |
| Program A | 29,759 | 30,652 | 40,000 | 74,000 | 137,000 |
| Program B | -- | -- | 44,000 | 86,000 | 161,000 |
| Textile Mill Products | | | | | |
| Program A | 24,568 | 28,499 | 50,000 | 110,000 | 225,000 |
| Program B | -- | -- | 55,000 | 127,000 | 266,000 |
| Chemical & Allied Products | | | | | |
| Program A | 31,376 | 33,572 | 60,000 | 147,000 | 351,000 |
| Program B | -- | -- | 66,000 | 170,000 | 414,000 |
| Paper & Allied Products | | | | | |
| Program A | W 4/ | W | W | W | W |
| Program B | -- | -- | W | W | W |
| Petroleum Refining | | | | | |
| Program A | 2,398 | 2,998 | 6,000 | 13,000 | 25,000 |
| Program B | -- | -- | 6,000 | 15,000 | 30,000 |
| Primary Metals | | | | | |
| Program A | 2,672 | 3,928 | 5,000 | 10,000 | 17,000 |
| Program B | -- | -- | 6,000 | 11,000 | 20,000 |
| Other Manufacturing | | | | | |
| Program A | 215,445 | 231,066 | 430,000 | 1,140,000 | 2,788,000 |
| Program B | -- | -- | 471,000 | 1,319,000 | 3,288,000 |

1/ Marketing receipts.
2/ 1970 data.
3/ Value at local point of delivery including stumpage, cutting, and hauling.
4/ W—Withheld to avoid disclosing company confidential information.

Table 50 - Index of Output by Major Industries in WRPA 4

| Industry | Index 1/ of Output for Indicated Years | | | | |
|---|---|---|---|---|---|
| | 1967 | 1968 | 1980 | 2000 | 2020 |
| Agriculture | | | | | |
| Program A | -- | 100 2/ | 137 | 158 | 180 |
| Program B | -- | 100 2/ | 137 | 169 | 193 |
| Forestry | | | | | |
| Program A | -- | 100 2/ | 86 | 138 | 148 |
| Program B | -- | 100 2/ | 109 | 187 | 268 |
| Mining, Petroleum | | | | | |
| Program A | 100 | 70 | 104 | 142 | 247 |
| Program B | 100 | 70 | 114 | 164 | 291 |
| Quarrying | | | | | |
| Program A | 100 | 104 | 139 | 233 | 408 |
| Program B | 100 | 104 | 152 | 269 | 481 |
| Manufacturing | | | | | |
| Program A | 100 | 108 | 193 | 488 | 1,157 |
| Program B | 100 | 108 | 212 | 564 | 1,365 |
| Food & Kindred Products | | | | | |
| Program A | 100 | 103 | 135 | 249 | 459 |
| Program B | 100 | 103 | 148 | 288 | 541 |
| Textile Mill Products | | | | | |
| Program A | 100 | 116 | 203 | 447 | 917 |
| Program B | 100 | 116 | 223 | 517 | 1,082 |
| Chemical & Allied Products | | | | | |
| Program A | 100 | 107 | 192 | 469 | 1,120 |
| Program B | 100 | 107 | 211 | 542 | 1,321 |
| Paper & Allied Products | | | | | |
| Program A | -- | -- | -- | -- | -- |
| Program B | -- | -- | -- | -- | -- |
| Petroleum Refining | | | | | |
| Program A | 100 | 125 | 242 | 536 | 1,062 |
| Program B | 100 | 125 | 265 | 620 | 1,253 |
| Primary Metals | | | | | |
| Program A | 100 | 147 | 204 | 361 | 637 |
| Program B | 100 | 147 | 224 | 418 | 751 |
| Other Manufacturing | | | | | |
| Program A | 100 | 107 | 199 | 529 | 1,294 |
| Program B | 100 | 107 | 219 | 612 | 1,526 |

1/ 1967 = 100.
2/ 1970 used as base.

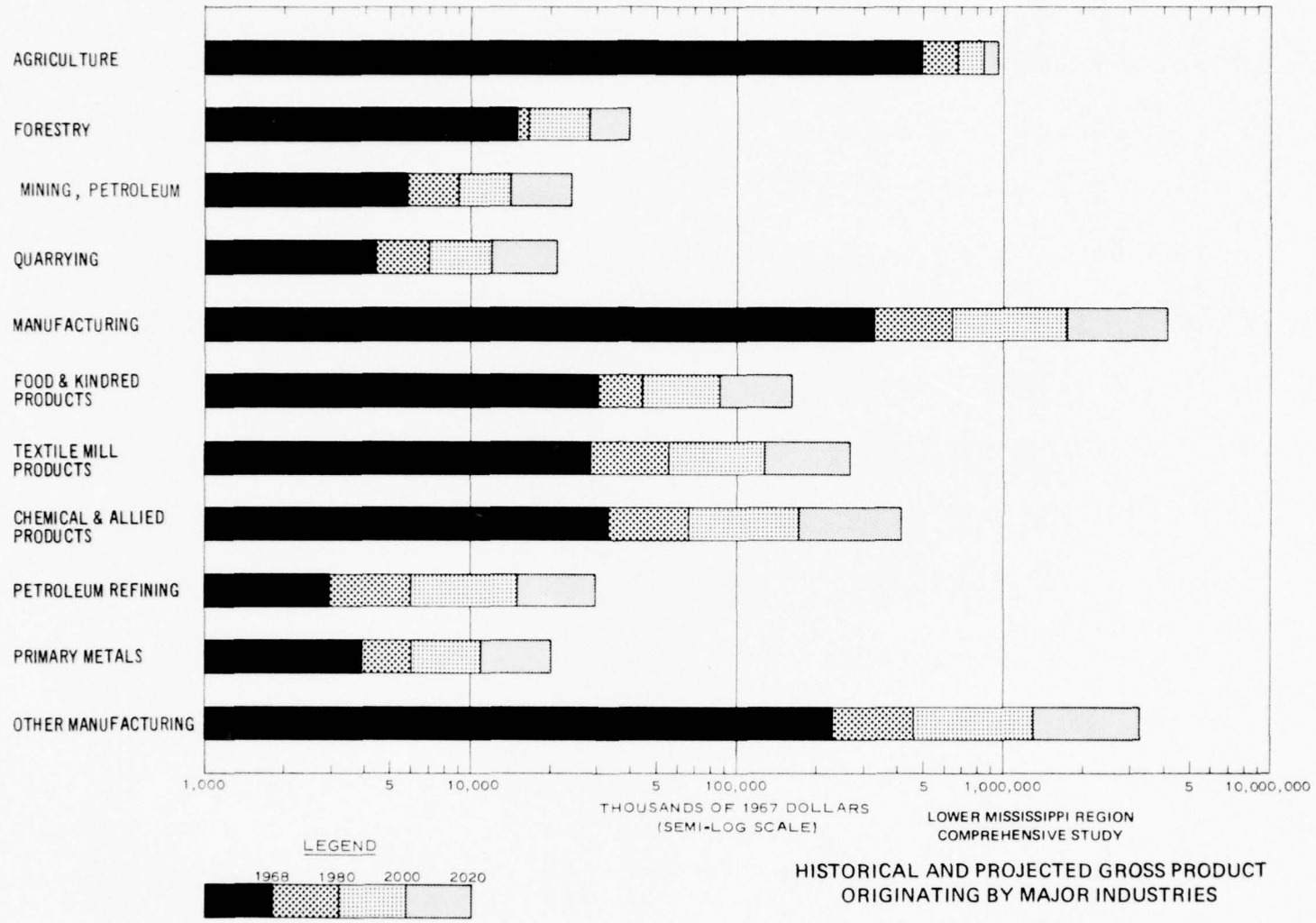



FIGURE 12

HISTORICAL AND PROJECTED GROSS PRODUCT
ORIGINATING BY MAJOR INDUSTRIES

WRPA 4 PROGRAM B

Table 51 - Earnings by Major Industries in WRPA 4

| Industry | Earnings for Indicated Years, thousands of 1967 dollars | | | | | |
|---|---|---|---|---|---|---|
| | 1950 | 1959 | 1968 | 1980 | 2000 | 2020 |
| Total, Program A | 605,050 | 681,917 | 973,738 | 1,370,000 | 2,942,000 | 6,638,000 |
| Total, Program B | -- | -- | -- | 1,502,000 | 3,402,000 | 7,829,000 |
| Per Worker 1/ | | | | | | |
| Program A | 2,483 | 3,270 | 4,215 | 6,026 | 11,258 | 20,806 |
| Program B | -- | -- | -- | 6,026 | 11,258 | 20,806 |
| Agriculture | | | | | | |
| Program A | 283,450 | 249,334 | 258,892 | 249,000 | 326,000 | 579,000 |
| Program B | -- | -- | -- | 273,000 | 377,000 | 683,000 |
| Forestry & Fisheries | | | | | | |
| Program A | 1,940 | 2,301 | 1,400 | 3,000 | 5,000 | 9,000 |
| Program B | -- | -- | -- | 3,000 | 6,000 | 11,000 |
| Mining | | | | | | |
| Program A | 3,928 | 3,968 | 3,518 | 5,000 | 8,000 | 12,000 |
| Program B | -- | -- | -- | 5,000 | 9,000 | 15,000 |
| Manufacturing | | | | | | |
| Program A | 45,756 | 86,095 | 205,855 | 348,000 | 838,000 | 1,941,000 |
| Program B | -- | -- | -- | 382,000 | 969,000 | 2,289,000 |
| Food & Kindred Products | | | | | | |
| Program A | 6,121 | 11,972 | 17,189 | 22,000 | 40,000 | 72,000 |
| Program B | -- | -- | -- | 24,000 | 46,000 | 85,000 |
| Textile Mill Products | | | | | | |
| Program A | 3,148 | 11,888 | 20,631 | 36,000 | 78,000 | 161,000 |
| Program B | -- | -- | -- | 39,000 | 91,000 | 190,000 |
| Chemical & Allied Products | | | | | | |
| Program A | 4,738 | 7,313 | 14,658 | 24,000 | 54,000 | 117,000 |
| Program B | -- | -- | -- | 27,000 | 62,000 | 138,000 |
| Paper & Allied Products | | | | | | |
| Program A | W 2/ | W | W | W | W | W |
| Program B | -- | -- | -- | W | W | W |
| Petroleum Refining | | | | | | |
| Program A | 780 | 646 | 1,327 | 2,000 | 5,000 | 10,000 |
| Program B | -- | -- | -- | 3,000 | 6,000 | 12,000 |
| Primary Metals | | | | | | |
| Program A | 0 | 143 | 2,638 | 4,000 | 6,000 | 11,000 |
| Program B | -- | -- | -- | 4,000 | 7,000 | 13,000 |
| Other Manufacturing | | | | | | |
| Program A | 30,969 | 54,133 | 149,412 | 260,000 | 655,000 | 1,570,000 |
| Program B | -- | -- | -- | 285,000 | 757,000 | 1,851,000 |
| All Other | | | | | | |
| Program A | 269,976 | 340,219 | 504,073 | 765,000 | 1,765,000 | 4,097,000 |
| Program B | -- | -- | -- | 839,000 | 2,041,000 | 4,831,000 |

1/ Per worker earnings are given in 1967 dollars.
2/ W—Withheld to avoid disclosing company confidential information.

Table 52 - Employment by Major Industries in WRPA 4

| Industry | Number of Persons Employed in Indicated Years | | | | |
|---|---|---|---|---|---|
| | 1950 | 1960 | 1980 | 2000 | 2020 |
| Total, Program A | 243,701 | 208,514 | 227,000 | 261,000 | 319,000 |
| Total, Program B | -- | -- | 249,000 | 302,000 | 376,000 |
| Agriculture | | | | | |
| Program A | 138,966 1/ | 75,588 1/ | 34,000 | 25,000 | 25,000 |
| Program B | -- | -- | 34,000 | 27,000 | 26,000 |
| Forestry & Fisheries | | | | | |
| Program A | -- | -- | 1,100 | 1,200 | 1,200 |
| Program B | -- | -- | 1,200 | 1,300 | 1,400 |
| Mining | | | | | |
| Program A | 437 | 476 | 320 | 330 | 370 |
| Program B | -- | -- | 350 | 380 | 440 |
| Manufacturing | | | | | |
| Program A | 14,245 | 26,415 | 45,000 | 62,000 | 81,000 |
| Program B | -- | -- | 49,000 | 71,000 | 95,000 |
| Food & Kindred Products | | | | | |
| Program A | 1,631 | 3,630 | 4,000 | 3,800 | 3,900 |
| Program B | -- | -- | 4,000 | 4,400 | 4,600 |
| Textile Mill Products | | | | | |
| Program A | 735 | 3,024 | 4,300 | 5,800 | 6,800 |
| Program B | -- | -- | 4,700 | 6,700 | 8,000 |
| Chemical Allied Products | | | | | |
| Program A | 1,252 | 1,265 | 2,400 | 3,200 | 4,100 |
| Program B | -- | -- | 2,700 | 3,700 | 4,800 |
| Paper & Allied Products | | | | | |
| Program A | 439 | 532 | W 2/ | W | W |
| Program B | -- | -- | W | W | W |
| Petroleum Refining | | | | | |
| Program A | 149 | 113 | 200 | 280 | 340 |
| Program B | -- | -- | 220 | 320 | 400 |
| Primary Metals | | | | | |
| Program A | 40 | 77 | 390 | 440 | 530 |
| Program B | -- | -- | 430 | 510 | 620 |
| Other Manufacturing | | | | | |
| Program A | 9,999 | 17,774 | 34,000 | 48,000 | 65,000 |
| Program B | -- | -- | 37,000 | 55,000 | 77,000 |
| All Other | | | | | |
| Program A | 90,053 | 106,035 | 147,000 | 172,000 | 212,000 |
| Program B | -- | -- | 165,000 | 202,000 | 253,000 |

1/ Includes forestry & fisheries data.
2/ W—Withheld to avoid disclosing company confidential information.



Grenada Lake recreation area



Miniships unloading at Vicksburg, Miss.



Vicksburg Harbor



Chemical plant at Yazoo City, Miss.

declined to 23,650 in 1970, average farm size increased from 152 acres in 1959 to 296 acres in 1970. Over 73 percent of the farms were classified as commercial in 1970, representing little change from 1959.

The value of farm products sold increased from $328.6 million in 1959 to an estimated $499.8 million in 1970, an increase of 52.1 percent. Thus, the average value of sales per farm was $21,100 in 1970, as compared with $7,000 in 1959. Crop marketings accounted for 89.9 percent of the total farm marketing receipts in 1970; the remaining 10.1 percent was attributable to the sale of livestock and livestock products. This represents a small change from the 1959 situation when the sale of crops and livestock and livestock products accounted for 85.1 and 14.9 percent, respectively, of total farm marketing receipts.

Soybeans and cotton are the principal crops harvested in the area. Combined, these two crops accounted for 87.1 percent of total crop acreages harvested in 1970. Other crops contributing more than 1 percent to total acres harvested in 1970 were as follows: hay crops, 4.9 percent; corn, 2.9 percent; rice, 1.7 percent; wheat, 1.4 percent; and oats, 1.3 percent. The most notable decreases in acreages between 1959 and 1970 were in cotton, corn, and oats. Significant increases occurred in soybeans and wheat.

Table 53 indicates the volumes of production for the various crops within WRPA 4. These values reflect the importance of soybeans and cotton as components of the agricultural industry. Table 53 also indicates the tremendous changes which have occurred in the production of certain crops. For example, soybean and rice production doubled during the 1959-1970 period, whereas corn and oat production declined to less than half the initial (1959) production.

Table 53 - Agricultural Production (Crops and Livestock) in WRPA 4

| Commodity | Unit of Measurement | Data for Indicated Years 1959 | 1970 | 1980 | 2000 | 2020 |
|---|---|---|---|---|---|---|
| Cotton | Bales | | | | | |
| Program A 1/ | | 1,262,386 | 1,408,500 | 2,105,000 | 2,288,000 | 2,471,000 |
| Program B 1/ | | -- | -- | 2,105,000 | 2,458,000 | 2,654,000 |
| Corn | Bushels | | | | | |
| Program A | | 11,583,524 | 3,600,000 | 1,814,000 | 2,508,000 | 2,999,000 |
| Program B | | -- | -- | 1,814,000 | 2,694,000 | 3,221,000 |
| Sorghum | Bushels | | | | | |
| Program A | | 490,675 | 185,500 | 383,000 | 492,000 | 682,000 |
| Program B | | -- | -- | 383,000 | 529,000 | 732,000 |
| Oats | Bushels | | | | | |
| Program A | | 6,140,652 | 2,156,000 | 2,723,000 | 2,812,000 | 2,916,000 |
| Program B | | -- | -- | 2,723,000 | 3,021,000 | 3,131,000 |
| Rice | Bushels | | | | | |
| Program A | | 2,679,361 | 4,907,225 | 8,416,000 | 9,925,000 | 11,810,000 |
| Program B | | -- | -- | 8,416,000 | 10,661,000 | 12,683,000 |
| Irish Potatoes | Bushels | | | | | |
| Program A | | 89,066 | 51,000 | 55,000 | 72,000 | 93,000 |
| Program B | | -- | -- | 55,000 | 77,000 | 100,000 |
| Sweet Potatoes | Bushels | | | | | |
| Program A | | 775,444 | 310,000 | 305,000 | 317,000 | 397,000 |
| Program B | | -- | -- | 305,000 | 340,000 | 427,000 |
| Tobacco | Pounds | | | | | |
| Program A | | 0 | 0 | 0 | 0 | 0 |
| Program B | | -- | -- | 0 | 0 | 0 |
| Sugarcane | Tons | | | | | |
| Program A | | 0 | 0 | 0 | 0 | 0 |
| Program B | | -- | -- | 0 | 0 | 0 |
| Wheat | Bushels | | | | | |
| Program A | | 745,153 | 1,293,000 | 4,712,000 | 5,637,000 | 6,253,000 |
| Program B | | -- | -- | 4,712,000 | 6,056,000 | 6,715,000 |
| Soybeans | Bushels | | | | | |
| Program A | | 20,076,369 | 41,640,000 | 67,275,000 | 83,642,000 | 97,350,000 |
| Program B | | -- | -- | 67,275,000 | 89,852,000 | 104,542,000 |

1/ Program A data incorporates 1970 production estimates; Program B data reflect the projected national growth rate shown in Table II-18, Selected National Aggregates, Volume I, Economic Activity in the United States by Water Resources Regions and Subareas, Historical and Projected, 1929-2020, pages II-18 through II-22.

Table 53 - Agricultural Production (Crops and Livestock) in WRPA 4 (Con.)

| Commodity | Unit of Measurement | Data for Indicated Years 1959 | 1970 | 1980 | 2000 | 2020 |
|---|---|---|---|---|---|---|
| Forest Products 2/ | Thousands of Cubic Feet | | | | | |
| Program A | | -- | 72,400 | 62,000 | 100,000 | 107,000 |
| Program B | | -- | -- | 79,000 | 135,000 | 194,000 |
| Hay | Tons | | | | | |
| Program A | | 209,229 | 195,555 | 310,000 | 383,000 | 472,000 |
| Program B | | -- | -- | 310,000 | 411,000 | 507,000 |
| Gross Value of Crops | Thousands of 1967 Dollars | | | | | |
| Program A | | 279,794 | 449,307 | 609,000 | 691,000 | 768,000 |
| Program B | | -- | -- | 609,000 | 747,000 | 836,000 |
| | | Livestock Thousands 3/ | | | | |
| Beef | Pounds | | | | | |
| Program A | | -- | 157,682 | 200,746 | 270,216 | 362,893 |
| Program B | | -- | -- | 200,746 | 290,277 | 389,703 |
| Pork | Pounds | | | | | |
| Program A | | -- | 36,915 | 42,113 | 55,008 | 71,405 |
| Program B | | -- | -- | 42,113 | 59,092 | 76,680 |
| Lamb | Pounds | | | | | |
| Program A | | -- | 191 | 146 | 172 | 212 |
| Program B | | -- | -- | 146 | 185 | 228 |
| Chickens | Pounds | | | | | |
| Program A | | -- | 25,091 | 34,959 | 48,814 | 65,536 |
| Program B | | -- | -- | 34,959 | 52,438 | 70,378 |
| Turkeys | Pounds | | | | | |
| Program A | | -- | 111 | 148 | 208 | 281 |
| Program B | | -- | -- | 148 | 223 | 302 |
| Eggs | Dozen | | | | | |
| Program A | | -- | 21,603 | 23,732 | 30,378 | 38,480 |
| Program B | | -- | -- | 23,732 | 32,633 | 41,323 |
| Milk | Pounds | | | | | |
| Program A | | -- | 198,830 | 182,510 | 225,264 | 275,108 |
| Program B | | -- | -- | 182,510 | 241,988 | 295,433 |
| Gross Value of Livestock | 1967 Dollars | | | | | |
| Program A | | 48,796 | 50,478 | 75,433 | 99,736 | 131,088 |
| Program B | | -- | -- | 75,433 | 107,141 | 140,773 |

2/ Includes sawlogs, veneer logs, pulpwood, poles, etc., cut for industrial or consumer uses. (U. S. Forest Service.)
3/ Net liveweight production.

## HISTORICAL TRENDS

### Population

As indicated in table 54, the population of WRPA 4 has declined continuously from the 1950 figure of 756,070 persons. A decrease of 10.8 percent occurred between 1950 and 1959, the period of greatest decrease, as the population fell to 674,398. The downward trend continued through 1970, resulting in a decrease of 5.4 percent during the 1959-1970 period and a 1970 population of 638,000 (approximately two-thirds of which was rural). Although the decline has been continuous since 1950, the rate of decrease was less than 0.5 percent annually between 1959 and 1970, as compared with 1.2 percent during the

Table 54 - Economic Profile Summary for WRPA 4

| Parameter | Data for Indicated Years | | | | | |
|---|---|---|---|---|---|---|
| | 1950 | 1959 | 1968 | 1980 | 2000 | 2020 |
| Population (1 July) 1/ | | | | | | |
| Program A | 756,070 | 674,398 | 654,953 | 635,000 | 701,000 | 828,000 |
| Program B | -- | -- | -- | 693,000 | 795,000 | 941,000 |
| Personal Income 2/ | | | | | | |
| Program A | 708,248 | 794,867 | 1,205,962 | 1,758,000 | 3,855,000 | 8,686,000 |
| Program B | -- | -- | -- | 1,927,000 | 4,458,000 | 10,244,000 |
| Per Capita 2/ | | | | | | |
| Program A | 937 | 1,179 | 1,841 | 2,769 | 5,495 | 10,491 |
| Program B | -- | -- | -- | 2,783 | 5,606 | 10,890 |
| Earnings 2/ | | | | | | |
| Total, Program A | 605,050 | 681,917 | 973,738 | 1,370,000 | 2,942,000 | 6,638,000 |
| Total, Program B | -- | -- | -- | 1,502,000 | 3,402,000 | 7,829,000 |
| Per Worker 2/ | | | | | | |
| Program A | 2,483 | 3,270 | 4,215 | 6,026 | 11,258 | 20,806 |
| Program B | -- | -- | -- | 6,026 | 11,258 | 20,806 |
| Employment | | | | | | |
| Total, Program A | 243,701 | 208,514 | 231,004 | 227,000 | 261,000 | 319,000 |
| Total, Program B | -- | -- | -- | 249,000 | 302,000 | 376,000 |
| Gross Manufacturing Product 2/ | | | | | | |
| Total, Program A | -- | -- | 330,715 | 591,000 | 1,494,000 | 3,543,000 |
| Total, Program B | -- | -- | -- | 648,000 | 1,728,000 | 4,179,000 |
| Gross Farm Marketing Receipts 2/ | | | | | | |
| Total, Program A | -- | -- | 499,785 3/ | 684,000 | 791,000 | 899,000 |
| Total, Program B | -- | -- | -- | 684,000 | 854,000 | 977,000 |

1/ U. S. Bureau of Census figures show the 1970 population of WRPA 4 as 637,574.
2/ Personal income, total earnings, gross manufacturing product, and gross farm marketing receipt data are given in thousands of 1967 dollars; per capita income and per worker earnings are given in 1967 dollars.
3/ 1970 data.

1950-1959 period. Based on OBERS projections, the decline in population for WRPA 4 has reached, or is nearing, the point at which the downward trend will be reversed. A primary factor aiding this reversal is that the migration of displaced farm labor to areas of employment, one of the principal causes of population loss, has expended most of its influence. Thus, the past has been a period of population loss for WRPA 4, and the present is essentially a period of stability.

## Employment

There were 231,000 persons employed in WRPA 4 in 1968, as compared with 208,500 in 1959 and 243,700 in 1950. These values reflect a decrease in employment of 14.4 percent between 1950 and 1959, but an increase of 10.8 percent from 1959 to 1968 (see table 54).

The decrease during the 1950-1959 period reflects the loss of employment as agriculture, a traditionally labor-intensive industry, adopted more mechanized methods. The technological strides in agriculture contributed to losses in agricultural employment that were not offset by increased employment in other industries. The influx of manufacturing into the area during the 1959-1968 period, accompanied by a lessening in agricultural employment losses, resulted in a reversal of the downward trend in employment and an absolute increase of 22,500 employed persons from 1959 to 1968.

In 1960, agriculture and manufacturing, the two most important major water-using industries as regards employment in WRPA 4, accounted for 36.3 and 12.7 percent, respectively, of the total employment in the area, as indicated in table 52. Agricultural employment declined from 139,000 in 1950 to 75,600 in 1960, a decrease of 45.6 percent. Manufacturing employment, in contrast, increased 85.9 percent from 14,200 to 26,400.

## Personal and Per Capita Income

As shown in table 54, total personal income in WRPA 4 increased from $708.2 million in 1950 to $1,206.0 million in 1968, or 70.3 percent. Eighty-three percent of this increase occurred in the period 1958-1968. The annual growth rate between 1950 and 1959 was only about 1.3 percent, restricted partially by the negative effect of decreasing employment and population. Between 1959 and 1968, however, personal income increased 4.7 percent annually due to a combination of factors such as the 10.8 percent increase in employment and greater use of skilled labor in more capital-intensive industries.

Per capita income for WRPA 4 in 1968 was $1,841, or 56.0 percent of the national average (see table 54). It increased 25.8 percent

between 1950 and 1959, although over half of this increase was attributable to the 10.8 percent decrease in the area's population. In comparison, per capita income increased 56.1 percent between 1959 and 1968, over 92 percent of which was due to actual increases in total personal income as more capital-intensive, skilled-worker industries moved into and expanded within the area. Although the area has been below the national average in per capita income, it has steadily made significant gains, which in recent years can be attributed more to absolute increases in total personal income and less to population losses.

## Total and Per Worker Earnings

Values in table 51 show that total earnings in WRPA 4 increased steadily from $605.0 million in 1950 to $973.7 million in 1968. This represents a 60.9 percent increase, 79.2 percent of which occurred during the 1959-1968 period. The annual growth rate (1.3 percent) was below that of the Nation (3.6 percent) during the 1950-1959 period and also during the 1959-1968 period, when it was 4.0 percent, as compared with 4.1 percent nationally. Earnings in agriculture and manufacturing, the two major contributors to earnings by specific major water-using industries, accounted for 26.6 and 21.1 percent, respectively, of the total earnings in WRPA 4 in 1968. This differs substantially from the 46.8 and 7.6 percent for agriculture and manufacturing in 1950. Agricultural earnings actually decreased 12.0 percent during the 1950-1959 period, but increased 3.8 percent from 1959 to 1968. In contrast, manufacturing earnings increased 88.2 and 139.1 percent during the 1950-1959 and 1959-1968 periods, respectively. This is indicative of the changes that occurred as the area moved toward a more manufacturing-oriented economy. Agricultural earnings seem to have reached a relatively stable level for the present, but manufacturing earnings are expected to continue increasing.

All other industries accounted for 51.8 percent of total earnings in WRPA 4 in 1968. Based on data compiled by OBE, major percentage contributions by industries in this category were as follows: (a) government, 16.5; (b) wholesale and retail trade, 13.8; and (c) services, 10.4. In comparison, these three industries accounted for 14.4, 14.6, and 9.9 percent of total earnings, respectively, in 1959. All other industries are expected to continue the present trend of accounting for larger shares of total earnings.

Earnings per worker were $4,215 in 1968, reflecting an increase of 28.9 percent over the 1959 value of $3,270 (see table 54). The annual rate of increase has been relatively steady, being 3.1 and 2.8 percent during the 1950-1959 and 1959-1968 periods, respectively. The per worker earnings increased from 55.0 percent of the national average in 1950 to 63.0 percent in 1968. Again, this reflects the displacement of

low-wage, labor-intensive industries in the area by industries providing more employment for skilled and semiskilled labor.

## ECONOMIC PROBLEMS

As of July 1971, 22 of the 26 counties in WRPA 4 were designated as eligible for assistance under the Public Works and Economic Development Act of 1965. Qualification of these counties, based on high unemployment and/or low median family incomes, permits them to obtain Federal aid in efforts to stimulate economic growth.

### Low Income Levels

Per capita income for WRPA 4 has historically been below the national average. The relatively low per capita income reflects the domination of the area's economy by traditionally labor-intensive industries which employ a high percentage of unskilled labor. Agriculture is the principal example, although mechanization has reduced the unskilled laborer requirements of this industry. Improvement has been made as reflected in the fact that per capita income for WRPA 4 increased from 45.0 percent of the national average in 1950 to 56.0 percent in 1968. However, this is still low relative to the Nation and the Lower Mississippi Region. The need exists for a more rapid transition to skilled and semiskilled employment as a percentage of total employment in the area.

### Unemployment and Underemployment

The high underemployment rate in the area is indicative of the low income level discussed above. Greater use of the area's manpower resources is needed in skilled and semiskilled employment. The movement to more capital-intensive methods by existing industries in WRPA 4 has contributed to another problem in the area, i.e., unemployment. As more advanced production methods have been introduced into the industries within the area, as in agriculture for example, many employment opportunities have been eliminated. Alternative employment has often been unavailable to the displaced worker due to the absolute lack of alternative employment or the inability of the worker to take advantage of that which does exist. The result has been substantial unemployment, as reflected in an unemployment rate of 6 percent in 1968.

### Population Loss

The problem of population loss is related to the problem of unemployment. Many workers displaced by the mechanization of traditionally labor-intensive industries have moved to other areas in search of jobs. Although the decline in population does not necessarily constitute a problem for WRPA 4, it does often present problems on a national level.

In many respects, the displaced workers often find a worse situation elsewhere. The end result may be a decline in personal, social, and economic conditions in general.

## PROGRAM A, NATIONAL INCOME

### Population

Program A projections in table 54 indicate that the population of WRPA 4 will continue downward through 1980 at the same rate as between 1959 and 1968 (0.3 percent annually). Beyond 1980, an upward trend is projected in the population, the annual growth rate being 0.5 percent between 1980 and 2000 and increasing to 0.8 percent during the following period (2000 to 2020). These growth rates are below those for the United States and the Lower Mississippi Region, both of which have rates greater than 1 percent annually beyond 1980. Percentage changes in population of -3.0, 10.4, and 18.1 are projected for the 1968-1980, 1980-2000, and 2000-2020 periods, respectively. These are well below both the national increases of 17.2, 31.0, and 30.1 percent and the regional increases of 7.1, 21.0, and 25.0 percent for the corresponding periods.

### Employment

Total employment in WRPA 4 is projected to decrease 1.7 percent between 1968 and 1980 under Program A (see table 54). This represents a reversal from the increase of 10.8 percent which occurred during the previous period (1959-1968). Beyond 1980, however, employment will increase at an accelerating rate, as reflected in the 15.0 percent increase and the 0.7 percent annual growth rate between 1980 and 2000 in comparison to the 22.2 percent increase and the growth rate of 1.0 percent annually during the following period (2000-2020). Thus, Program A projects that the present trend of increasing employment will be reversed to a downward trend during the 1970's, and that total employment will increase after 1980 at an accelerating rate (table 52).

### Personal and Per Capita Income

As shown in table 54, Program A projections indicate that the 1968 total personal income of $1,206.0 million will increase to $1,758.0 million by 1980, an increase of 45.8 percent. This is below the 51.7 percent increase which occurred during the previous period (1959-1968). It also represents an annual growth rate of 3.2 percent, as compared with 4.5 nationally and 3.8 regionally. Beyond 1980, however, rates of 4.0 to 4.1 percent annually approach those of the Nation and Lower Mississippi Region. Therefore, a continuation of the upward trend in personal income is expected during the next few years, followed by increases at a rising rate below that of the 1959-1968 period.

The Program A per capita income values in table 54 indicate

average annual growth rates in per capita income of 3.5, 3.5, and 3.3 percent for the 1968-1980, 1980-2000, and 2000-2020 periods, respectively. Growth during the 1968-1980 period will be substantially below the 5.1 percent annual increase from 1959 to 1968. In the past, the population decline of WRPA 4 has accounted for part of the increase in per capita income (8 percent between 1959 and 1968). Future increases will result completely from higher personal income. Previous discussion pointed to the movement of the per capita income in WRPA 4 toward the national average. Projections indicate a continuation of this trend to the extent that the area's per capita incomes should be 58.0, 66.0, and 74.0 percent of the national average in 1980, 2000, and 2020, respectively. Although the growth of total personal income for the Nation is higher than that of WRPA 4, the difference in the population growth rate between the two is even greater, thus bringing the per capita income of WRPA 4 nearer to that of the Nation.

## Total and Per Worker Earnings

Earnings are expected to increase at an accelerating rate between 1980 and 2020 under Program A (see table 51). The annual growth rate of 4.0 percent between 1959 and 1968 is well above the 2.9 percent projected for 1968 to 1980. The difference would be greater had projected agricultural earnings increased rather than decreased during the 1968-1980 period. Annual growth rates of 3.9 and 4.2 percent are projected for the 1980-2000 and 2000-2020 periods, respectively. Although the growth rates of WRPA 4 are below those of the Nation and the Lower Mississippi Region during the earlier periods, the 2000-2020 rate of 4.2 percent annually is above the national and regional rates.

The continued decline of agriculture's influence upon the economy in WRPA 4 is reflected in the projected decrease in agricultural earnings as a percentage of total earnings from 26.6 percent in 1968 to 11.1 percent in 2000 and 8.7 percent in 2020. In contrast, manufacturing earnings are projected to increase from 21.1 percent of total earnings in 1968 to 29.2 percent in 2020. The manufacturing increases will occur primarily in the machinery and other manufacturing categories.

As shown in table 54, per worker earnings are projected to increase approximately 3.0 percent annually after 1980. This is slightly above the 1959-1968 rate of 2.8 percent, thus reflecting the increase in skilled and semiskilled employment as a proportion of total employment. As this continues, per worker earnings are projected to increase from 63.0 percent of the national average in 1968 to 78.0 percent in 2020.

All other industries are projected to continue accounting for larger percentages of total earnings (61.7 percent in 2020 as compared

with 51.8 percent in 1968). The greatest increases in this category are expected in government, services, and finance, insurance, and real estate.

## PROGRAM B, REGIONAL DEVELOPMENT

### Population

Based on Program B projections, the 1980 and 2020 populations for WRPA 4 will be 8.6 and 47.5 percent greater, respectively, than the 1970 population of 638,000 (see table 54). A comparison of the population projections under Programs A and B reveals that Program B projected populations are 9.1, 13.4, and 13.6 percent higher than Program A populations in 1980, 2000, and 2020, respectively. Program B indicates that the decline in the area's population is presently being reversed and that there will be 55,000 more people in the area in 1980 than in 1970. This contrasts with Program A, which shows a continued decline in the population of the area through 1980 and an increase thereafter.

### Employment

As shown in table 54, total employment in the area is projected to increase 7.8 percent between 1968 and 1980 under Program B. This is slightly lower than the 10.8 percent increase which occurred between 1959 and 1968. It also differs sharply from the 1.7 percent decrease which is projected to occur under Program A. Through 1980, therefore, Program B projections indicate a continuation of increasing employment in the area similar to that which has occurred during the past decade and an increasing rate of employment thereafter. Under Program A, in comparison, the present trend of increasing employment will be reversed, i.e., employment will decline through 1980 and increase thereafter at a rate lower than for Program B. Between 1980 and 2020, total employment for WRPA 4 is projected to increase 40.5 and 51.0 percent under Programs A and B, respectively (table 52).

### Personal and Per Capita Income

The income values in table 54 indicate an increase of 59.8 percent between 1968 and 1980 under Program B. This results in total personal income in 1980 that is 9.6 percent higher for Program B than for Program A. The rate of increase under Program B is higher than that under Program A through 2020. However, Program B projects increases at a decreasing rate after 2000, and Program A projects increases at an increasing rate.

Program B estimates indicate increases in per capita income of 51.2 percent between 1968 and 1980 and 491.5 percent between 1968 and 2020. The relationship of population and total personal income

increases between Programs A and B is such that projected per capita incomes for the two programs are equal.

## Total and Per Worker Earnings

Total earnings are projected to increase from $973.7 million in 1968 to $1,370.0 million in 1980 and $6,638.0 million in 2020 (see table 51). These values indicate a continuation of the upward trend in earnings at an increasing rate, as reflected in annual growth rates of 3.7, 4.2, and 4.3 percent during the 1968-1980, 1980-2000, and 2000-2020 periods, respectively. The Program B growth rate between 1968 and 1980 is substantially above the 2.9 percent of Program A, but the difference between the programs after 1980 is only 0.1 to 0.3 percent annually.

Program B projections indicate increases in earnings per worker equal to those of Program A. This means that per worker earnings will increase 3.0 and 3.2 percent annually after 1968, as compared with an annual increase of 2.8 percent during the 1959-1968 period. Thus, earnings per worker of $6,026, $11,258, and $20,806 are expected in 1980, 2000, and 2020, respectively, under Program B as well as under Program A.

## OUTLOOK FOR THE FUTURE

The population of WRPA 4 has declined steadily since 1950. During the projection period, however, substantial increases are expected. Program B projections indicate that the decline is presently being reversed, and Program A projections show a continuation of the decline through 1980 but an increase thereafter. Although an increasing rate of growth is expected, it will remain below that of the Nation and the Lower Mississippi Region.

The upward trend in total personal income is expected to continue, although the rate of growth will remain below that of the 1959-1968 period. Total projected income increases under Program A are generally below the national and regional increases, but those under Program B are greater. Thus, total personal income in WRPA 4 is projected to account for a lesser percentage of the national total under Program A but a greater percentage under Program B.

During the projection period, per capita income is projected to increase approximately 3.5 percent annually, a rate below that of the past decade. As a result, per capita income in WRPA 4 will increase from 56 to 74 percent of the national average during the 1968-2020 period.

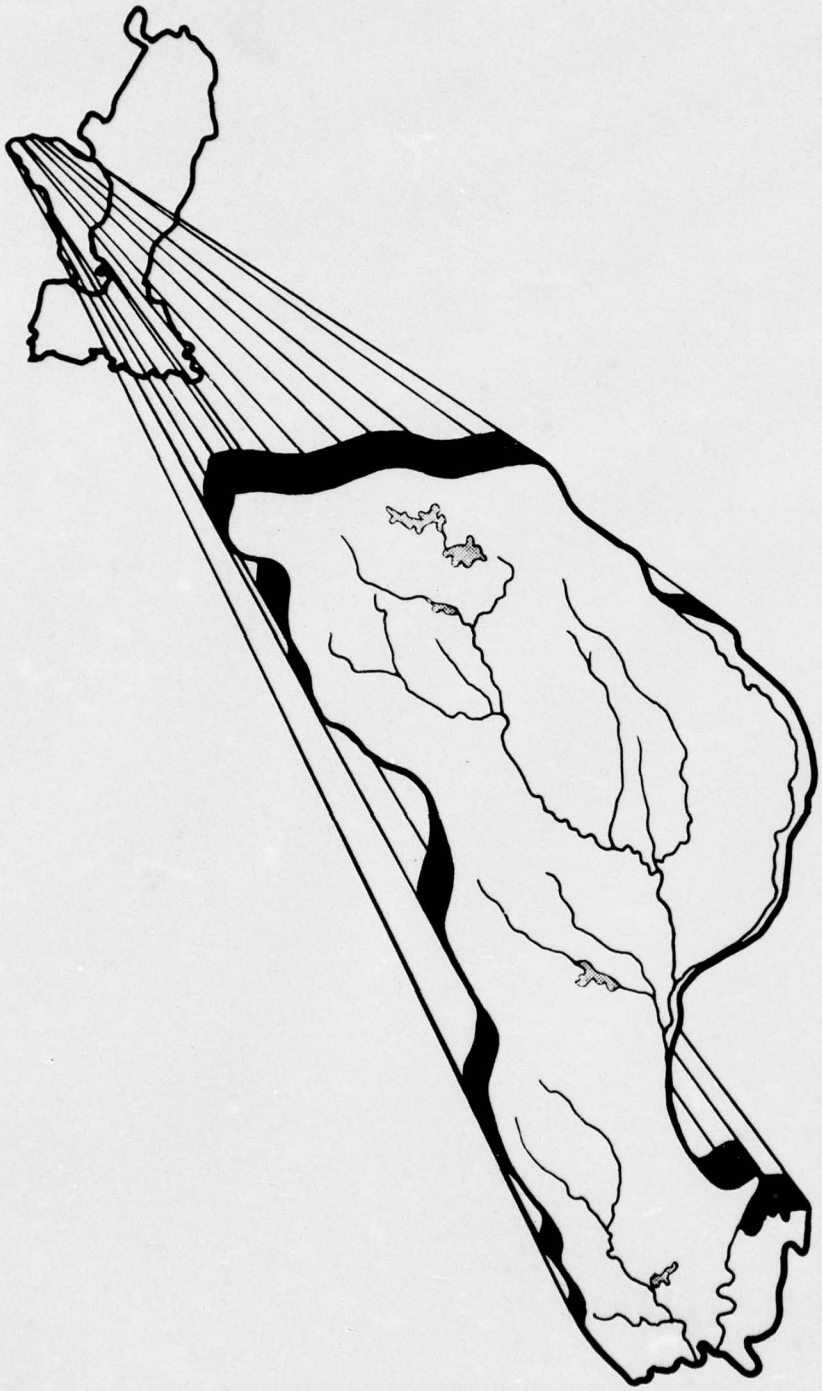
A slight decline is projected in employment during the next decade. Thereafter, slow growth is expected, although the rate of growth will remain below that for the Nation and the Lower Mississippi Region.

Total earnings are projected to increase at a rate below the national and regional rates through 1980. Beyond 1980, however, the accelerating rate of growth in WRPA 4 will be essentially equal to that of the Nation and the Lower Mississippi Region. During the projection period, agriculture, manufacturing, government, wholesale and retail trade, and services will remain as the major contributors to total earnings in WRPA 4. The greatest change in earnings as a percentage of total WRPA 4 earnings will occur in agriculture, which will decline from the largest contributor to fifth largest. By 1980, manufacturing will replace agriculture as the major earnings industry in the area.

Historically, agriculture has accounted for a greater share of total gross production than any other major water-using industry in WRPA 4. However, manufacturing production is projected to exceed that of agriculture between 1980 and 2000. Similar changes have occurred in earnings, thus reflecting the replacement of agriculture by manufacturing as the major industry in the area.

In general, basic changes in the economy of WRPA 4 have been similar to those in many of the traditionally agricultural areas of the

Lower Mississippi Region. The overall changes reflect a movement from labor-intensive to more capital-intensive industries, a result of which has been a significant change in the employment base of the area. It appears that much of the change has already occurred and that basic trends have been or are presently being set. Future efforts will be oriented toward development of more capital-intensive industries in the area. As this occurs, skilled and semiskilled employment will continue to represent a greater share of total employment, thus pushing per capita income and per worker earnings toward the national average. Overall, the area is expected to progress comparatively well, as is reflected in projected income and earnings growth above that of the Nation and the Lower Mississippi Region in future periods. Although regional development programs can aid in the economic development of WRPA 4, the broad, basic nature of the changes that are occurring necessarily involves a substantial time period.



# WRPA 5

# W R P A  5 ,  O U A C H I T A

## PHYSICAL DESCRIPTION

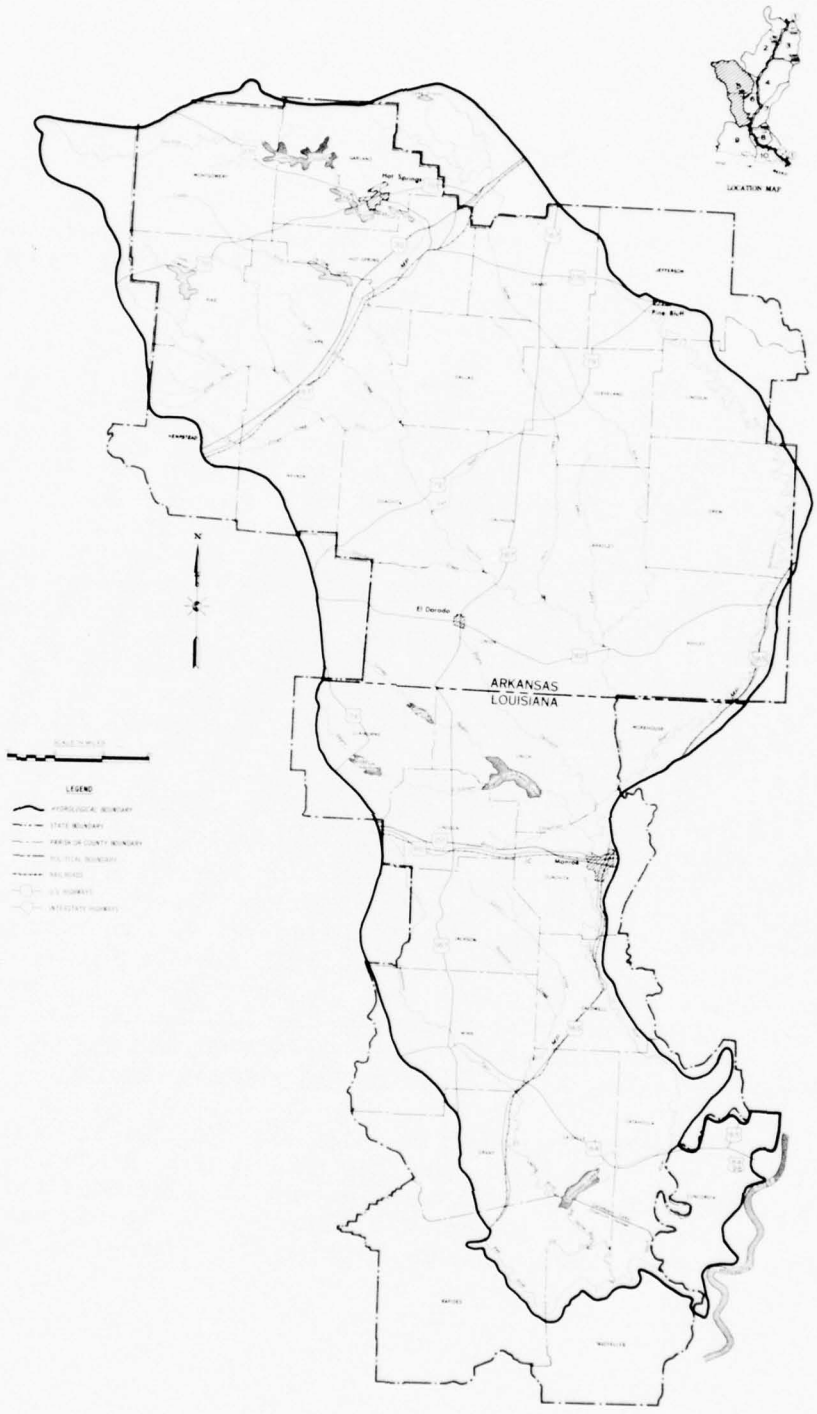
WRPA 5, based on county boundaries (figure 13), consists of 13,237 square miles in south-central Arkansas and 9,148 square miles in north-central Louisiana. The 30 counties and parishes of the area are adjacent to or lie within the Ouachita River Basin.

The Ouachita River Basin extends generally southwesterly and westerly from the Arkansas River drainage basin and the west-bank Mississippi River levees to the divide of the more eastern tributaries of the Red River. It is bounded on the west and southwest by the Red River Basin and on the east by the Boeuf-Tensas Basin.

The Ouachita River originates in the Ouachita Mountains near Mena, Ark. (Polk County), and flows easterly 160 miles through rugged terrain to the vicinity of Malvern, Ark. It continues southwesterly 24 miles and southeasterly 70 miles through hilly uplands to Camden, Ark. From this point (river mile 351), the stream extends southeasterly 132 miles through the bottomlands of hilly terrain and southerly 224 miles through the alluvial valley of the Mississippi River to enter the Red River 36 miles above its mouth.

The upper portion of the basin is a rugged, mountainous area consisting of numerous ridges and narrow valleys with elevations ranging from 500 to 2,500 ft above mean sea level. A large portion of this rugged terrain lies within the Ouachita National Forest. Much of the lower three-fourths of the basin is characterized by the rolling hills of the West Gulf Coastal Plain Section. Small farms and extensive tracts of commercial forest occupy much of the uplands. The southern and eastern portions of the basin contain the fertile soils of the alluvial valley of the Mississippi River. This land is generally flat to slightly rolling and is well adapted to large-scale farming.

The Ouachita River is joined at intervals throughout its entire length by numerous tributaries, the principal ones in Arkansas being the Saline, Caddo, and Little Missouri Rivers and Smackover and Moro Creeks. In Louisiana, the principal tributaries are Bayous Bartholomew, DeLoutre, and D'Arbonne and the Little, Boeuf, and Tensas Rivers.




LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

**WATER RESOURCE PLANNING**
**AREA 5**

FIGURE 13

## ECONOMIC DESCRIPTION

### Natural Resources

WRPA 5 comprises 14,326,400 acres. That part of WRPA 5 lying in south-central Arkansas consists of 13,237 square miles, or 8,471,680 acres. The lower part of WRPA 5, located in north-central Louisiana, comprises 9,148 square miles, or 5,854,720 acres. Agricultural lands comprise 13,598,500 acres, or about 95 percent of total land in the area. Approximately 29 percent of this is in farms, and 71 percent is in forest and other uses. Nonagricultural land, consisting of Federal land, urban and built-up areas, and small bodies of water, comprises an additional 531,791 acres.

Agricultural land is one of the most valuable natural resources of the area. Soybeans, cotton, and corn are the principal crops. Forests also provide an important source of income.

Commercial forest lands cover 10.8 million acres, or almost 75 percent of WRPA 5. More than 90 percent of this land is privately owned. The most common timber types are the loblolly-shortleaf pine, which occupies 35 percent of the forest land, and oak-gum cypress, which occupies 21 percent of the area.

In 1968, mineral production for the area exceeded $172 million. Petroleum, sand, gravel, bromine, natural gas, clay, and natural gas liquids were the most commonly produced minerals. Union County produced 58 percent of the total for that part of WRPA 5 lying in Arkansas, and Claiborne, Ouachita, Lincoln, and La Salle Parishes contributed most to mineral production in the Louisiana part of the area.

Sport fishing is a year-round recreational activity in this area. Abundant fishing opportunity is offered by the existing streams, oxbow lakes, farm ponds, man-made lakes, and large river impoundments (Lakes Ouachita, Greeson, DeGray, Catherine, and Hamilton). Largemouth bass, smallmouth bass, spotted bass, white crappie, black crappie, bluegill, redear sunfish, walleye, and channel catfish are the principal native fish species taken for sport. Striped bass and rainbow trout have been introduced into suitable waters of the area in recent years. Also, there is a significant commercial fishery in the area for channel, blue, and flathead catfish, freshwater drum, and buffalo fish.

The extensive pine-hardwood forests of the uplands and the bottomland hardwood forests of the alluvial floodplains support good populations of native wildlife species. Hunting is a major recreational activity, with deer, wild turkeys, squirrels, and rabbits being the major game species taken. Migratory waterfowl are hunted on the lakes and streams of the floodplain areas and in the flooded bottomland forests.

For example, Catahoula Lake, a major wintering area for migratory waterfowl within the area, has a great concentration of ducks and geese during most hunting seasons. The open farmlands of the area provide excellent hunting for upland game birds and cottontail rabbits.

## Industrial Development

In 1967, manufacturing employment for WRPA 5 was 44,100, about 82 percent of which was production workers. The total payroll for the 1,599 manufacturing firms in the area was $233.8 million.

The value of gross production by manufacturing increased from $524.4 million in 1967 to $555.9 million in 1968, an increase of 6 percent (see tables 55 and 56 and figure 14). Between 1963 and 1967, the value added by manufacturing increased 28 percent.

Twenty-two percent of the 1,599 firms had 20 or more employees, and 8 percent employed 100 or more. The major water-using manufacturing industry, based on value of gross product, was the paper and allied products industry, which accounted for 26 percent of the gross production value for manufacturing industries. Other industry groups, listed in order of contribution to total gross product by manufacturing, were chemical and allied products, petroleum refining, and food and kindred products (see table 57). Lumber and furniture production, which is not classified as a major water-using industry, contributes substantially to gross production from manufacturing, as does machinery production.

## Agricultural Development

Land in farms accounted for 25.5 percent of WRPA 5 in 1970, as compared with 27.0 percent in 1959. This represents a small decrease in farmland, but greater changes have occurred in farm structure. For example, between 1949 and 1970 the number of farms decreased 63 percent, but the average farm size increased 99 percent. In 1970, the 21,633 farms in the area (42.5 percent of which were commercial) averaged 169 acres in size and $10,000 in annual sales.

Over time, total cropland has represented less than 50 percent of the total farmland. During the period 1949-1970, the range was 38 to 44 percent. Farm forest land declined from 2.1 million acres in 1949 to 1.6 million acres in 1970. Less than half the total farm forest land is pastured, some of which is physically suitable for crop production. Permanent pastureland has remained relatively stable over time although a slight upward trend is expected. Other farmland accounts for approximately 4 percent of total farmland.

Most of the farms in the area are noncommercial. This indicates

Table 55 - Gross Product Originating by Major Industries in WRPA 5

| Industry | Gross Product Originating in Indicated Years thousands of 1967 dollars | | | | |
|---|---|---|---|---|---|
| | 1967 | 1968 | 1980 | 2000 | 2020 |
| Agriculture 1/ | | | | | |
| Program A | -- | 175,890 2/ | 250,000 | 314,000 | 384,000 |
| Program B | -- | -- | 250,000 | 330,000 | 414,000 |
| Forestry 3/ | | | | | |
| Program A | -- | 99,300 | 140,900 | 178,100 | 195,600 |
| Program B | -- | -- | 144,500 | 183,700 | 209,700 |
| Mining, Petroleum | | | | | |
| Program A | 117,990 | 121,530 | 146,000 | 156,000 | 224,000 |
| Program B | -- | -- | 160,000 | 180,000 | 264,000 |
| Quarrying | | | | | |
| Program A | 12,213 | 11,480 | 15,000 | 21,000 | 32,000 |
| Program B | -- | -- | 16,068 | 25,000 | 38,000 |
| Manufacturing | | | | | |
| Program A | 524,431 | 555,897 | 918,000 | 2,024,000 | 4,374,000 |
| Program B | -- | -- | 1,006,000 | 2,341,000 | 5,159,000 |
| Food & Kindred Products | | | | | |
| Program A | 36,248 | 36,973 | 40,000 | 63,000 | 105,000 |
| Program B | -- | -- | 43,000 | 73,000 | 124,000 |
| Textile Mill Products | | | | | |
| Program A | 6,025 | 6,628 | 10,000 | 18,000 | 34,000 |
| Program B | -- | -- | 10,000 | 21,000 | 40,000 |
| Chemical & Allied Products | | | | | |
| Program A | 44,615 | 50,861 | 84,000 | 195,000 | 446,000 |
| Program B | -- | -- | 92,000 | 225,000 | 526,000 |
| Paper & Allied Products | | | | | |
| Program A | 138,734 | 145,671 | 234,000 | 495,000 | 1,053,000 |
| Program B | -- | -- | 257,000 | 573,000 | 1,242,000 |
| Petroleum Refining | | | | | |
| Program A | 33,101 | 39,721 | 65,000 | 126,000 | 231,000 |
| Program B | -- | -- | 71,000 | 145,000 | 273,000 |
| Primary Metals | | | | | |
| Program A | 25,249 | 29,289 | 39,000 | 65,000 | 104,000 |
| Program B | -- | -- | 43,000 | 75,000 | 123,000 |
| Other Manufacturing | | | | | |
| Program A | 240,459 | 246,754 | 446,000 | 1,062,000 | 2,400,000 |
| Program B | -- | -- | 490,000 | 1,229,000 | 2,831,000 |

1/ Marketing receipts.
2/ 1970 data.
3/ Value at local point of delivery including stumpage, cutting, and hauling.

Table 56 - Index of Output by Major Industries in WRPA 5

| Industry | Index 1/ of Output for Indicated Years | | | | |
|---|---|---|---|---|---|
| | 1967 | 1968 | 1980 | 2000 | 2020 |
| Agriculture | | | | | |
| Program A | -- | 100 2/ | 142 | 213 | 218 |
| Program B | -- | 100 | 142 | 229 | 234 |
| Forestry | | | | | |
| Program A | -- | 100 2/ | 142 | 179 | 197 |
| Program B | -- | 100 | 146 | 185 | 211 |
| Mining, Petroleum | | | | | |
| Program A | 100 | 103 | 124 | 132 | 190 |
| Program B | 100 | 103 | 136 | 153 | 224 |
| Quarrying | | | | | |
| Program A | 100 | 94 | 120 | 174 | 262 |
| Program B | 100 | 94 | 132 | 201 | 309 |
| Manufacturing | | | | | |
| Program A | 100 | 106 | 175 | 386 | 834 |
| Program B | 100 | 106 | 192 | 446 | 984 |
| Food & Kindred Products | | | | | |
| Program A | 100 | 102 | 109 | 173 | 291 |
| Program B | 100 | 102 | 120 | 200 | 343 |
| Textile Mill Products | | | | | |
| Program A | 100 | 110 | 158 | 298 | 560 |
| Program B | 100 | 110 | 173 | 345 | 660 |
| Chemical & Allied Products | | | | | |
| Program A | 100 | 114 | 188 | 437 | 999 |
| Program B | 100 | 114 | 206 | 505 | 1,178 |
| Paper & Allied Products | | | | | |
| Program A | 100 | 105 | 169 | 357 | 759 |
| Program B | 100 | 105 | 185 | 413 | 895 |
| Petroleum Refining | | | | | |
| Program A | 100 | 120 | 196 | 380 | 699 |
| Program B | 100 | 120 | 215 | 439 | 824 |
| Primary Metals | | | | | |
| Program A | 100 | 116 | 156 | 257 | 412 |
| Program B | 100 | 116 | 171 | 297 | 486 |
| Other Manufacturing | | | | | |
| Program A | 100 | 103 | 186 | 442 | 998 |
| Program B | 100 | 103 | 203 | 511 | 1,177 |

1/ 1967 = 100.
2/ 1970 used as base.

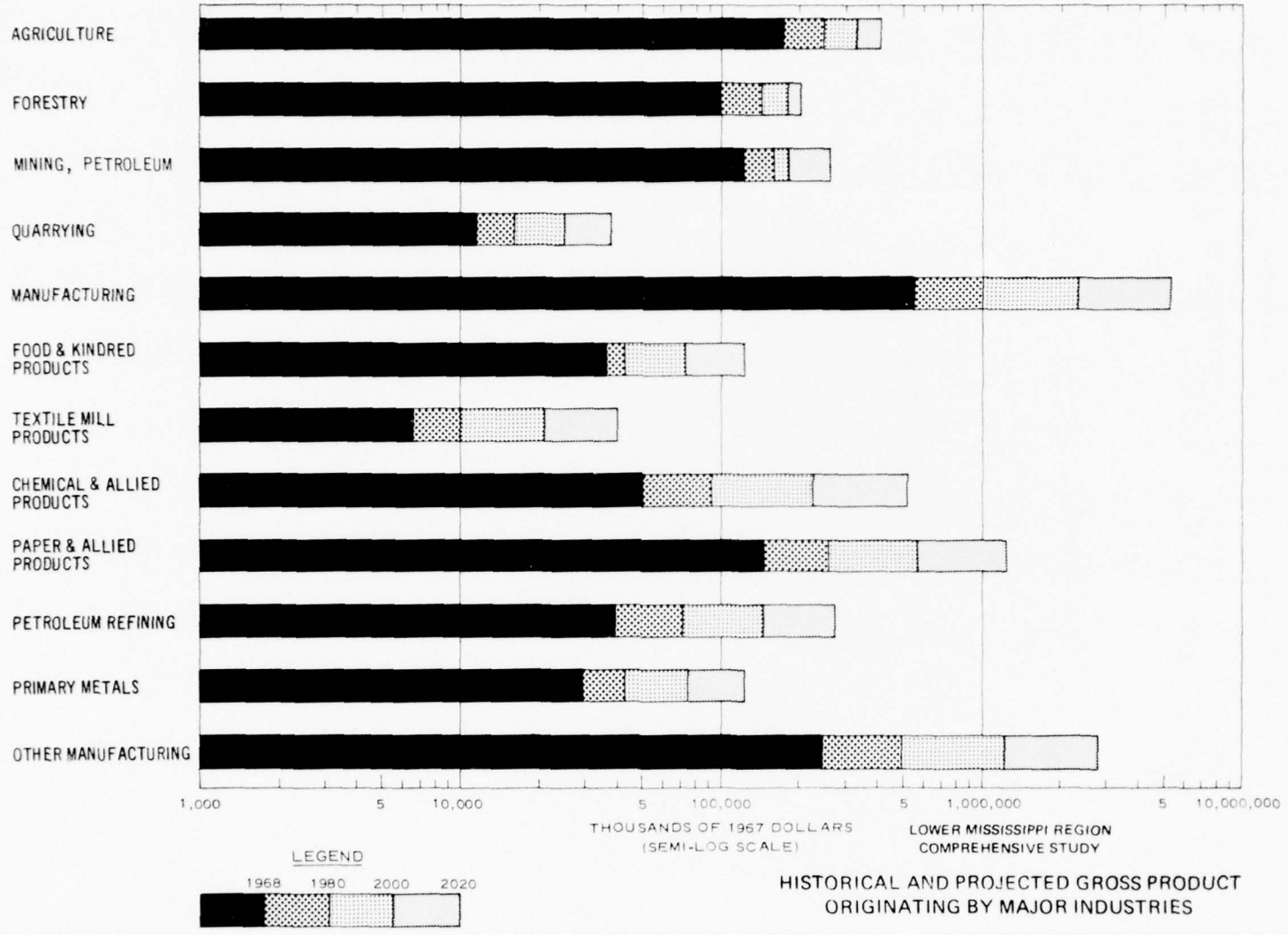



FIGURE 14

HISTORICAL AND PROJECTED GROSS PRODUCT
ORIGINATING BY MAJOR INDUSTRIES

WRPA 5 PROGRAM B

Table 57 - Employment by Major Industries in WRPA 5

| Industry | Number of Persons Employed in Indicated Years | | | | |
|---|---|---|---|---|---|
| | 1950 | 1960 | 1980 | 2000 | 2020 |
| Total, Program A | 245,274 | 242,856 | 283,600 | 343,000 | 432,000 |
| Total, Program B | -- | -- | 310,000 | 396,000 | 510,000 |
| Agriculture | | | | | |
| Program A | 56,648 1/ | 22,942 1/ | 9,200 | 6,900 | 6,600 |
| Program B | -- | -- | 9,200 | 7,400 | 7,100 |
| Forestry & Fisheries | | | | | |
| Program A | -- | -- | 1,900 | 2,100 | 2,200 |
| Program B | -- | -- | 2,100 | 2,400 | 2,600 |
| Mining | | | | | |
| Program A | 5,163 | 4,580 | 4,000 | 3,200 | 2,600 |
| Program B | -- | -- | 4,400 | 3,700 | 3,100 |
| Manufacturing | | | | | |
| Program A | 47,023 | 53,269 | 68,200 | 82,400 | 99,800 |
| Program B | -- | -- | 74,800 | 95,300 | 117,800 |
| Food & Kindred Products | | | | | |
| Program A | 2,815 | 4,203 | 3,000 | 2,800 | 2,700 |
| Program B | -- | -- | 3,300 | 3,200 | 3,100 |
| Textile Mill Products | | | | | |
| Program A | 1,007 | 845 | 1,100 | 1,100 | 1,100 |
| Program B | -- | -- | 1,200 | 1,300 | 1,300 |
| Chemical & Allied Products | | | | | |
| Program A | 3,119 | 3,846 | 3,600 | 4,500 | 5,700 |
| Program B | -- | -- | 4,000 | 5,200 | 6,700 |
| Paper & Allied Products | | | | | |
| Program A | 6,985 | 9,696 | 12,500 | 16,400 | 21,300 |
| Program B | -- | -- | 13,700 | 19,000 | 25,100 |
| Petroleum Refining | | | | | |
| Program A | 2,125 | 1,676 | 1,800 | 1,400 | 1,000 |
| Program B | -- | -- | 2,000 | 1,600 | 1,200 |
| Primary Metals | | | | | |
| Program A | 1,094 | 1,690 | 2,600 | 3,100 | 3,600 |
| Program B | -- | -- | 2,800 | 3,600 | 4,200 |
| Other Manufacturing | | | | | |
| Program A | 29,878 | 31,313 | 43,600 | 53,100 | 64,400 |
| Program B | -- | -- | 47,800 | 61,400 | 76,100 |
| All Other | | | | | |
| Program A | 136,440 | 162,065 | 199,700 | 248,000 | 320,800 |
| Program B | -- | -- | 219,500 | 287,000 | 379,400 |

1/ Includes forestry and fisheries data.

that many farms are operated by persons who, in addition to being part-time or part-retirement farm operators, have other jobs. Farms operated by full owners predominated from 1949 to 1970.

Major crops, based on percentage of total acres harvested, in WRPA 5 in 1970 were as follows: soybeans, 47 percent; cotton, 22 percent; hay crops, 15.9 percent; and rice, 4.7 percent. The major changes in acreages have occurred in soybeans and cotton, as reflected by the fact that these crops accounted for 22.4 and 30.7 percent, respectively, of total acres harvested in the area in 1959.

Currently, livestock and poultry enterprises are almost equally as important as crop enterprises. In 1970, there were 3,587 livestock, dairy, and poultry farms, or 17 percent of the total farms in the area. During the period 1949-1970, there was an upward trend in the sale of cattle and calves, chickens, broilers, and eggs. There was a decline in sales of turkeys and in the sale of cream. Sales of milk have remained fairly stable over time.

In 1970, farm marketing receipts totaled $175.9 million (table 58). Field crops accounted for 55 percent of the total, and livestock and livestock products 45 percent. Total gross farm income was approximately $204.5 million, realized net farm income approximately $61.4 million, and net income per farm $2,838.



Lake Hamilton, near Hot Springs, Ark.



Ouachita National Forest



Cattle grazing in fescue and clover pasture



Georgia-Pacific paper plant, Crossett, Ark.

Table 58 - Agricultural Production (Crops and Livestock) in WRPA 5

| Commodity | Unit of Measurement | Amount Required in Indicated Years | | | | |
|---|---|---|---|---|---|---|
| | | 1959 | 1970 | 1980 | 2000 | 2020 |
| Cotton | Bales | | | | | |
| Program A 1/ | | 266,930 | 289,328 | 322,000 | 350,000 | 378,000 |
| Program B 1/ | | -- | -- | 322,000 | 376,000 | 407,000 |
| Corn | Bushels | | | | | |
| Program A | | 3,606,886 | 1,306,000 | 335,000 | 463,000 | 554,000 |
| Program B | | -- | -- | 335,000 | 498,000 | 595,000 |
| Sorghum | Bushels | | | | | |
| Program A | | 88,579 | 280,000 | 484,000 | 621,000 | 861,000 |
| Program B | | -- | -- | 484,000 | 667,000 | 924,000 |
| Oats | Bushels | | | | | |
| Program A | | 571,189 | 680,000 | 599,000 | 619,000 | 642,000 |
| Program B | | -- | -- | 599,000 | 666,000 | 689,000 |
| Rice | Bushels | | | | | |
| Program A | | 2,442,532 | 4,063,172 | 5,255,000 | 6,197,000 | 7,375,000 |
| Program B | | -- | -- | 5,255,000 | 6,657,000 | 7,919,000 |
| Irish Potatoes | Bushels | | | | | |
| Program A | | 163,123 | 62,750 | 52,000 | 67,000 | 87,000 |
| Program B | | -- | -- | 52,000 | 72,000 | 94,000 |
| Sweet Potatoes | Bushels | | | | | |
| Program A | | 859,845 | 451,500 | 420,000 | 436,000 | 547,000 |
| Program B | | -- | -- | 420,000 | 469,000 | 588,000 |
| Tobacco | Pounds | | | | | |
| Program A | | 0 | 0 | 0 | 0 | 0 |
| Program B | | -- | -- | -- | -- | -- |
| Sugarcane | Tons | | | | | |
| Program A | | 76,749 | 120,000 | 149,000 | 173,000 | 194,000 |
| Program B | | -- | -- | 149,000 | 186,000 | 208,000 |
| Wheat | Bushels | | | | | |
| Program A | | 44,908 | 386,000 | 1,095,000 | 1,310,000 | 1,453,000 |
| Program B | | -- | -- | 1,095,000 | 1,407,000 | 1,560,000 |
| Soybeans | Bushels | | | | | |
| Program A | | 4,187,148 | 10,079,450 | 18,311,000 | 24,178,000 | 29,942,000 |
| Program B | | -- | -- | 18,311,000 | 26,073,000 | 32,154,000 |

1/ Program A data were calculated by incorporating 1970 production estimates. Program B data reflect the projected national growth rate shown in Table II-3, Selected Agricultural Products, pages II-18 through II-22, Volume 1, Economic Activity in the United States by Water Resource Regions and Subareas, Historical and Projected, 1929-2020, United States Water Resources Council, April 1971.

Table 58 - Agricultural Production (Crops and Livestock) in WRPA 5 (Con.)

| Commodity | Unit of Measurement | Amount Required in Indicated Years | | | | |
|---|---|---|---|---|---|---|
| | | 1959 | 1970 | 1980 | 2000 | 2020 |
| Forest Products 2/ | Thousands of | | | | | |
| Program A | Cubic Feet | -- | 392,600 | 557,000 | 704,000 | 773,000 |
| Program B | | -- | -- | 571,000 | 726,000 | 829,000 |
| Hay | Tons | | | | | |
| Program A | | 191,379 | 205,979 | 282,000 | 347,000 | 428,000 |
| Program B | | -- | -- | 282,000 | 373,000 | 460,000 |
| Gross Value of Crops | Thousands of 1967 | | | | | |
| Program A | Dollars | 67,741 | 97,181 | 143,800 | 170,000 | 197,000 |
| Program B | | -- | -- | 143,800 | 184,000 | 214,000 |
| | | Livestock Thousands 3/ | | | | |
| Beef | Pounds | | | | | |
| Program A | | -- | 140,436 | 163,837 | 220,534 | 296,172 |
| Program B | | -- | -- | 163,837 | 236,907 | 318,053 |
| Pork | Pounds | | | | | |
| Program A | | -- | 19,350 | 30,624 | 40,001 | 51,925 |
| Program B | | -- | -- | 30,624 | 42,970 | 55,761 |
| Lamb | Pounds | | | | | |
| Program A | | -- | 96 | 80 | 93 | 116 |
| Program B | | -- | -- | 80 | 100 | 125 |
| Chickens | Pounds | | | | | |
| Program A | | -- | 176,981 | 246,921 | 344,780 | 462,889 |
| Program B | | -- | -- | 246,921 | 370,377 | 497,087 |
| Turkeys | Pounds | | | | | |
| Program A | | -- | 687 | 916 | 1,288 | 1,740 |
| Program B | | -- | -- | 916 | 1,384 | 1,869 |
| Eggs | Dozen | | | | | |
| Program A | | -- | 64,005 | 70,389 | 90,101 | 114,126 |
| Program B | | -- | | 70,389 | 96,790 | 122,557 |
| Milk | Pounds | | | | | |
| Program A | | -- | 117,256 | 107,550 | 132,745 | 162,117 |
| Program B | | -- | -- | 107,550 | 142,600 | 174,094 |
| Gross Value of Livestock | 1967 Dollars | | | | | |
| Program A | | 44,632 | 78,709 | 106,143 | 143,822 | 186,940 |
| Program B | | -- | -- | 106,143 | 152,517 | 200,749 |

2/ Includes sawlogs, veneer logs, pulpwood, poles, etc., cut for industrial or consumer uses.

3/ Net liveweight production.

## HISTORICAL TRENDS

### Population

The population of WRPA 5 increased from 777,500 in 1959 to 822,000 in 1970, an increase of 5.7 percent (see table 59). During the preceding period (1950-1959) the population remained unchanged. Urban and rural populations were almost equal. Agriculture has traditionally been an important factor in the area's economy, although not to the extent that it is in WRPA's 4, 6, and 7. As agriculture shifted to more mechanized methods between 1950 and 1959, migration of displaced farm

Table 59 - Economic Profile Summary for WRPA 5

| Parameter | Data for Indicated Years | | | | | |
|---|---|---|---|---|---|---|
| | 1950 | 1959 | 1968 | 1980 | 2000 | 2020 |
| Population (1 July) 1/ | | | | | | |
| Program A | 777,362 | 777,500 | 824,397 | 857,000 | 998,000 | 1,210,000 |
| Program B | -- | -- | -- | 911,000 | 1,132,000 | 1,377,000 |
| Personal Income 2/ | | | | | | |
| Program A | 929,406 | 1,180,079 | 1,821,031 | 2,654,000 | 5,878,000 | 13,226,000 |
| Program B | -- | -- | -- | 2,910,000 | 6,798,000 | 15,599,000 |
| Per Capita 2/ | | | | | | |
| Program A | 1,196 | 1,518 | 2,209 | 3,095 | 5,892 | 10,931 |
| Program B | -- | -- | -- | 3,194 | 6,005 | 11,325 |
| Earnings 2/ | | | | | | |
| Total, Program A | 738,731 | 939,368 | 1,389,826 | 2,064,000 | 4,506,000 | 9,976,000 |
| Total, Program B | -- | -- | -- | 2,263,000 | 5,212,000 | 11,766,000 |
| Per Worker 2/ | | | | | | |
| Program A | 3,012 | 3,868 | 5,096 | 7,305 | 13,154 | 23,086 |
| Program B | -- | -- | -- | 7,305 | 13,154 | 23,086 |
| Employment | | | | | | |
| Total, Program A | 245,274 | 242,856 | 272,706 | 283,000 | 343,000 | 432,000 |
| Total, Program B | -- | -- | -- | 310,000 | 396,000 | 510,000 |
| Gross Manufacturing Product 2/ | | | | | | |
| Total, Program A | -- | -- | 555,897 | 918,000 | 2,024,000 | 4,374,000 |
| Total, Program B | -- | -- | -- | 1,006,000 | 2,341,000 | 5,159,000 |
| Gross Farm Marketing Receipts 2/ | | | | | | |
| Total, Program A | -- | -- | 175,890 3/ | 250,000 | 314,000 | 384,000 |
| Total, Program B | -- | -- | -- | 250,000 | 336,000 | 414,000 |

1/ U. S. Bureau of Census figures show the 1970 population of WRPA 5 as 821,878.
2/ Personal income, total earnings, gross manufacturing product, and gross farm marketing receipt data are given in thousands of 1967 dollars; per capita income and per worker earnings are given in 1967 dollars.
3/ 1970 data.

laborers resulted in population losses, but the losses were not of sufficient magnitude to outweigh gains made elsewhere. The population increase during the period 1959-1969 partially reflects a diminishing of the effect of agricultural labor losses. Although the area has not experienced the drastic loss of population that has occurred in other WRPA's, its population increases have remained below those of the Nation and the Lower Mississippi Region.

## Employment

The employment figures in table 59 indicate that there were 272,700 persons employed in WRPA 5 in 1968, as compared with 242,900 in 1959 and 245,300 in 1950. These values indicate an increase of 12.3 percent in employment between 1959 and 1968 in contrast to a 1.0 percent decrease during the previous period (1950-1959).

The two most important major water-using industries in WRPA 5, agriculture and manufacturing, accounted for 9.4 and 21.9 percent, respectively, of the area's total employment in 1960 (table 57). This contrasts to the situation in 1950 when agriculture was the major employment industry. In manufacturing, the paper and allied products and the food and kindred products industries were the most significant based on employment.

The trend in employment for WRPA 5 reflects once again the effects upon the area of capital-intensive industries gaining in economic influence. During the 1950-1960 period, agricultural employment 1/ dropped almost 60 percent, a decline not offset by increases in other industries. Between 1959 and 1968, however, the decline in agricultural employment lessened while employment in other industries increased, the result being that the downward trend of the 1950's was changed to an upward trend during the 1960's.

## Personal and Per Capita Income

As shown in table 59, total personal income in WRPA 5 increased from $929.4 million in 1950 to $1,821.0 million in 1968, or 95.9 percent. Seventy-two percent of this increase occurred between 1959 and 1968, a period in which the annual growth rate was 4.9 percent. During the prior period, 1950-1959, the annual growth rate was substantially less at 2.7 percent. The slower increase during the 1950-1959 period reflects the restrictive effect of decreasing employment and a disproportionate amount of unskilled labor requirements. An increase in

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1/ All 1950 and 1960 employment figures for agriculture in WRPA 5 include employment in forestries and fisheries.

employment of 12.3 percent and the employment of more skilled and semiskilled labor contributed to the rapid increases in total personal income between 1959 and 1968. These factors further illustrate the declining role of labor-intensive industries, particularly agriculture, in the economy of WRPA 5.

In 1968, the per capita income in WRPA 5 was $2,209, or 67.0 percent of the national average. This is greater than the 1950 value of $1,196, which was only 58.0 percent of the national average, thus indicating an improvement in the area's per capita income relative to that of the Nation. Increases of 26.9 and 45.5 percent occurred during the 1950-1959 and 1959-1968 periods, respectively. In general, the per capita income of WRPA 5 has moved steadily upward toward the national average, a trend which is expected to continue.

## Total and Per Worker Earnings

The values shown in table 60 indicate that total earnings in WRPA 5 increased steadily from $738.7 million in 1950 to $1,389.8 million in 1968, an increase of 88.1 percent. Over 69 percent of this increase occurred during the 1959-1968 period. Earnings in agriculture and manufacturing, the two major water-using industries in the area, accounted for 7.5 and 24.7 percent, respectively, of the total earnings in WRPA 5 in 1968. This compares with 15.3 and 19.9 percent contributions by these industries, respectively, in 1950. Agricultural earnings have varied the most, decreasing 22.9 percent from 1950 to 1959, but increasing 19.1 percent during the following period (1959-1968). In comparison, manufacturing earnings have followed a more definite trend, as revealed in the 48.9 percent increase from 1950 to 1959 followed by a 56.7 percent increase between 1959 and 1968.

All other industries accounted for 65.4 percent of total earnings in WRPA 5 in 1968. Major percentage contributions were as follows: (a) wholesale and retail trade, 15.3 percent; (b) government, 18.7 percent; and (c) services, 13.2 percent. Percent increases over the 1959 values for (a), (b), and (c), were 32.0, 61.2, and 50.7, respectively. The other industries should retain or slightly increase their share of total earnings.

Earnings per worker were $5,096 in 1968 as compared with $3,868 in 1959, a 31.7 percent increase during the period (see table 59). The annual rate of increase was relatively steady at approximately 2.8 to 3.1 percent during the 1950-1968 period. Per worker earnings increased from 67.0 percent of the national average in 1950 to 72.0 percent in 1959 and 76.0 percent in 1968. This reflects again the movement to more skilled and semiskilled labor as a percentage of total employment in the area, the result of which has been favorable both in absolute terms and in comparison with the rest of the Nation.

Table 60 - Earnings by Major Industries in WRPA 5

| Industry | Earnings for Indicated Years, thousands of 1967 dollars | | | | | |
|---|---|---|---|---|---|---|
| | 1950 | 1959 | 1968 | 1980 | 2000 | 2020 |
| Total, Program A | 738,731 | 939,368 | 1,389,826 | 2,064,000 | 4,506,000 | 9,976,000 |
| Total, Program B | -- | -- | -- | 2,263,000 | 5,212,000 | 11,766,000 |
| Per Worker 1/ | | | | | | |
| Program A | 3,012 | 3,868 | 5,096 | 7,305 | 13,154 | 23,086 |
| Program B | -- | -- | -- | 7,305 | 13,154 | 23,086 |
| Agriculture | | | | | | |
| Program A | 112,942 | 87,057 | 103,677 | 74,000 | 93,000 | 162,000 |
| Program B | -- | -- | -- | 81,000 | 108,000 | 191,000 |
| Forestry and Fisheries | | | | | | |
| Program A | 3,115 | 3,338 | 3,428 | 6,000 | 12,000 | 22,000 |
| Program B | -- | -- | -- | 7,000 | 14,000 | 26,000 |
| Mining | | | | | | |
| Program A | 36,959 | 32,294 | 30,951 | 37,000 | 46,000 | 57,000 |
| Program B | -- | -- | -- | 40,000 | 53,000 | 67,000 |
| Manufacturing | | | | | | |
| Program A | 147,180 | 219,137 | 343,450 | 542,000 | 1,136,000 | 2,390,000 |
| Program B | -- | -- | -- | 594,000 | 1,314,000 | 2,819,000 |
| Food and Kindred Products | | | | | | |
| Program A | 9,894 | 15,736 | 20,731 | 22,000 | 33,000 | 56,000 |
| Program B | -- | -- | -- | 24,000 | 39,000 | 66,000 |
| Textile Mill Products | | | | | | |
| Program A | 1,652 | 1,655 | 4,779 | 7,000 | 13,000 | 24,000 |
| Program B | -- | -- | -- | 7,000 | 15,000 | 28,000 |
| Chemical & Allied Products | | | | | | |
| Program A | 9,657 | 16,766 | 22,054 | 34,000 | 71,000 | 149,000 |
| Program B | -- | -- | -- | 37,000 | 82,000 | 175,000 |
| Paper & Allied Products | | | | | | |
| Program A | 25,825 | 57,889 | 83,567 | 135,000 | 285,000 | 605,000 |
| Program B | -- | -- | -- | 148,000 | 329,000 | 713,000 |
| Petroleum Refining | | | | | | |
| Program A | 8,114 | 11,601 | 17,599 | 27,000 | 50,000 | 89,000 |
| Program B | -- | -- | -- | 30,000 | 57,000 | 105,000 |
| Primary Metals | | | | | | |
| Program A | 5,087 | 13,629 | 19,725 | 26,000 | 42,000 | 68,000 |
| Program B | -- | -- | -- | 28,000 | 49,000 | 80,000 |
| Other Manufacturing | | | | | | |
| Program A | 86,951 | 101,861 | 174,995 | 291,000 | 642,000 | 1,399,000 |
| Program B | -- | -- | -- | 320,000 | 743,000 | 1,652,000 |
| All Other | | | | | | |
| Program A | 438,535 | 597,542 | 908,320 | 1,405,000 | 3,219,000 | 7,345,000 |
| Program B | -- | -- | -- | 1,541,000 | 3,723,000 | 8,663,000 |

1/ Per worker earnings are given in 1967 dollars.

## ECONOMIC PROBLEMS

As of July 1971, 20 of the 30 counties and parishes in WRPA 5 were designated as eligible for assistance under the Public Works and Economic Development Act of 1965. Qualification of these counties and parishes, based on high unemployment and/or low median family incomes, permits them to obtain Federal aid in efforts to stimulate economic growth.

### Low Income Levels

As in many other areas within the Lower Mississippi Region, the income level for WRPA 5 has been historically low as a percentage of the national average. In 1968, for example, the average per capita income for the area was $2,209, or 67.0 percent of the national average. Low-income, labor-intensive industries have been dominant in the area. The need is for a higher concentration of industries requiring a greater proportion of skilled and semiskilled labor.

### Unemployment and Underemployment

Unemployment for WRPA 5 in 1969 was normal at 4 percent. However, underemployment was substantially high due to the low per capita income of the area relative to the Nation. Based on OBERS projections, the area's per capita income will increase as a percentage of the national average. This should lessen the underemployment problem assuming that unemployment does not vary substantially from its present level.

### Population Loss

Loss of population has been a problem for WRPA 5 or, in a broader sense, for the Nation in the past. As in many other geographical areas, labor-oriented methods and labor-intensive industries have been altered and/or replaced by a combination of technological advances and capital-intensive industries. The result has been a declining population as displaced workers moved to areas providing employment. In recent years, however, the downward trend in population has been reversed. Additional new industry and the expansion of existing industry are needed if the area is to obtain its share of population increases.

## PROGRAM A, NATIONAL INCOME

### Population

As shown in table 59, the present upward trend in population for WRPA 5 is projected to continue through 2020. However, the annual growth rate of 0.3 percent between 1968 and 1980 represents a decline from the rate of 0.7 percent during the 1959-1968 period. An increase in the rate is projected to occur beyond 1980, although it will remain below that of the Nation and Lower Mississippi Region (1.0 to 1.4 percent). As the population for WRPA 5 increases from 824,400 in 1968 to a projected 1,210,000 in 2020, specific increases of 4.0, 16.5, and 21.2 percent are expected during the 1968-1980, 1980-2000, and 2000-2020 periods, respectively.

Although projections show population increases for WRPA 5, the amount and rate of growth will be below national and regional averages. Thus, the population of WRPA 5, as a percentage of United States and Lower Mississippi Region population, will continue to decline.

### Employment

According to the employment values presented in table 59, total employment is projected to increase 0.3 percent annually between 1968 and 1980. Although this is slightly below the 1.3 percent increase which occurred between 1959 and 1968, it does indicate a continuation of the upward trend of the past decade. Agricultural employment will drop substantially, particularly prior to 1980. The total employment growth rate will increase at an increasing rate beyond 1980, as indicated by rates of 1.0 and 1.2 percent annually during the 1980-2000 and 2000-2020 periods, respectively. Slightly less than one-fourth of this increase will be attributable to increased employment in major water-using industries. Based on these rates, the 1968 employment of 272,700 workers will increase to 283,000 in 1980 and 432,000 in 2020.

### Personal and Per Capita Income

Program A projections in table 59 indicate that the 1968 total personal income of $1,821.0 million will increase to $2,654.0 million in 1980, a 45.7 percent increase. This indicates an annual growth rate of 3.2 percent, a rate below that of the Nation (4.5 percent) and the region (3.8 percent). It also indicates an increase below the 54.3 percent that occurred during the previous period (1959-1968). Beyond 1980, however, a growth rate of 4.1 percent annually is essentially equal to those of the Nation and the Lower Mississippi Region. Thus, projections indicate that the increase in total personal income will

continue, with the rate of growth being below that of the 1959-1968 period through 1980 but increasing thereafter.

Under Program A projections, per capita income in WRPA 5 will increase from $2,209 in 1968 to $3,095 in 1980, or 40.1 percent (see table 59). The annual growth rate of 2.9 percent during this period will be followed by periods of growth at rates of 3.3 and 3.1 percent between 1980 and 2000 and between 2000 and 2020, respectively. Previous discussion indicated that the per capita income for WRPA 5 has moved steadily toward the national average. Program A projects that the trend will continue to the extent that the area's per capita income will be 65.0, 71.0, and 77.0 percent of the national average in 1980, 2000, and 2020, respectively.

## Total and Per Worker Earnings

As shown in table 60, Program A projections indicate a continuation of the upward trend in earnings in WRPA 5. The 1968 earnings level of $1,389.8 million is projected to increase to $2,064.0 million in 1980, an increase of 48.5 percent. The annual growth rate during this period will be 3.4 percent, as compared with a 4.4 percent growth rate during the preceding period (1959-1968). Rates of 4.0 and 4.1 percent are projected for the 1980-2000 and 2000-2020 periods, respectively. Although the growth rates in WRPA 5 will be below those of the Nation and Lower Mississippi Region during the 1968-1980 period, they will be practically equal to the national and regional rates after 1980.

Agricultural earnings, as a percentage of total earnings in WRPA 5, are projected to decrease from 7.5 percent in 1968 to 3.6 percent in 1980 and 1.6 percent in 2020, thus reflecting the continuing decrease in the importance of agriculture in WRPA 5. Manufacturing earnings will remain relatively stable, decreasing slightly from 26.3 percent of total earnings in 1980 to 24.0 percent in 2020.

All other industries are projected to continue accounting for greater percentages of total earnings, i.e., 73.6 percent in 2020 as compared with 65.4 percent in 1968. The larger increases in this group are expected in government, services, and wholesale and retail trade.

As skilled and semiskilled employment increases as a percentage of total employment in WRPA 5, per worker earnings will climb toward the national average. For example, per worker earnings are projected to increase from 76.0 percent of the national average in 1968 to 87.0 percent in 2020. Under Program A, an annual increase of 3.0 percent, which is slightly below the 3.1 percent of the previous period (1959-1968), is expected between 1960 and 1980.

## PROGRAM B, REGIONAL DEVELOPMENT

### Population

An increase in population of 10.8 percent is projected for WRPA 5 between 1970 and 1980 (see table 59), as compared with a 4.3 percent increase under Program A. As a result of the difference in the rate of increase for the two programs, the projected population for 1980 under Program B is 6.3 percent greater than that under Program A. Although the increase in population is expected to continue under both programs, the projected rate of increase for all periods is higher for Program B.

### Employment

Program B projections in table 57 indicate that the trend of increasing employment in the area is expected to continue at about the same rate through 1980 as has occurred during the past decade. For example, the area's employment increased 12.3 percent between 1959 and 1968, and Program B projects an increase of 13.7 percent between 1968 and 1980. Program A, in contrast, projects an increase of only 3.8 percent between 1968 and 1980, an increase substantially below that of the last decade.

Between 1968 and 2020, Program B employment is expected to increase 87.0 percent. By 2020, therefore, employment under Program B will be 18.1 percent higher than employment under Program A.

### Personal and Per Capita Income

As shown in table 59, total personal income under Program B is projected to increase 59.8 percent between 1968 and 1980 and 756.6 percent between 1968 and 2020. The rate of growth during the 1968-1980 period, 4.0 percent annually, is lower than the 4.9 percent growth rate that occurred during the 1959-1968 period. Projected total personal incomes for Program B are 9.6 and 17.9 percent higher than projected Program A incomes in 1980 and 2020, respectively.

The growth of population and total personal income for Programs A and B is such that per capita income projections for the two are similar. Under Program B, the 1968 per capita income is projected to increase 44.6 percent by 1980 and 412.7 percent by 2020.

### Total and Per Worker Earnings

Program B projections indicate a continuation of the upward trend

in earnings in WRPA 5 (see table 60). The 1968 earnings level of $1,389.8 million is projected to increase to $2,263.0 million in 1980, or 62.8 percent. The annual growth rate of 4.1 percent during this period is slightly below the 4.4 percent growth rate of the 1959-1968 period. It is also below the 4.2 to 4.3 percent projected rate for the 1980-2020 period.

Programs A and B project an annual increase in per worker earnings of 2.9 to 3.0 percent between 1968 and 2020, a rate of growth slightly below the 3.1 percent growth rate of the 1959-1968 period. Based on these rates, per worker earnings of $7,305, $13,154, and $23,086 are projected for 1980, 2000, and 2020, respectively.

## OUTLOOK FOR THE FUTURE

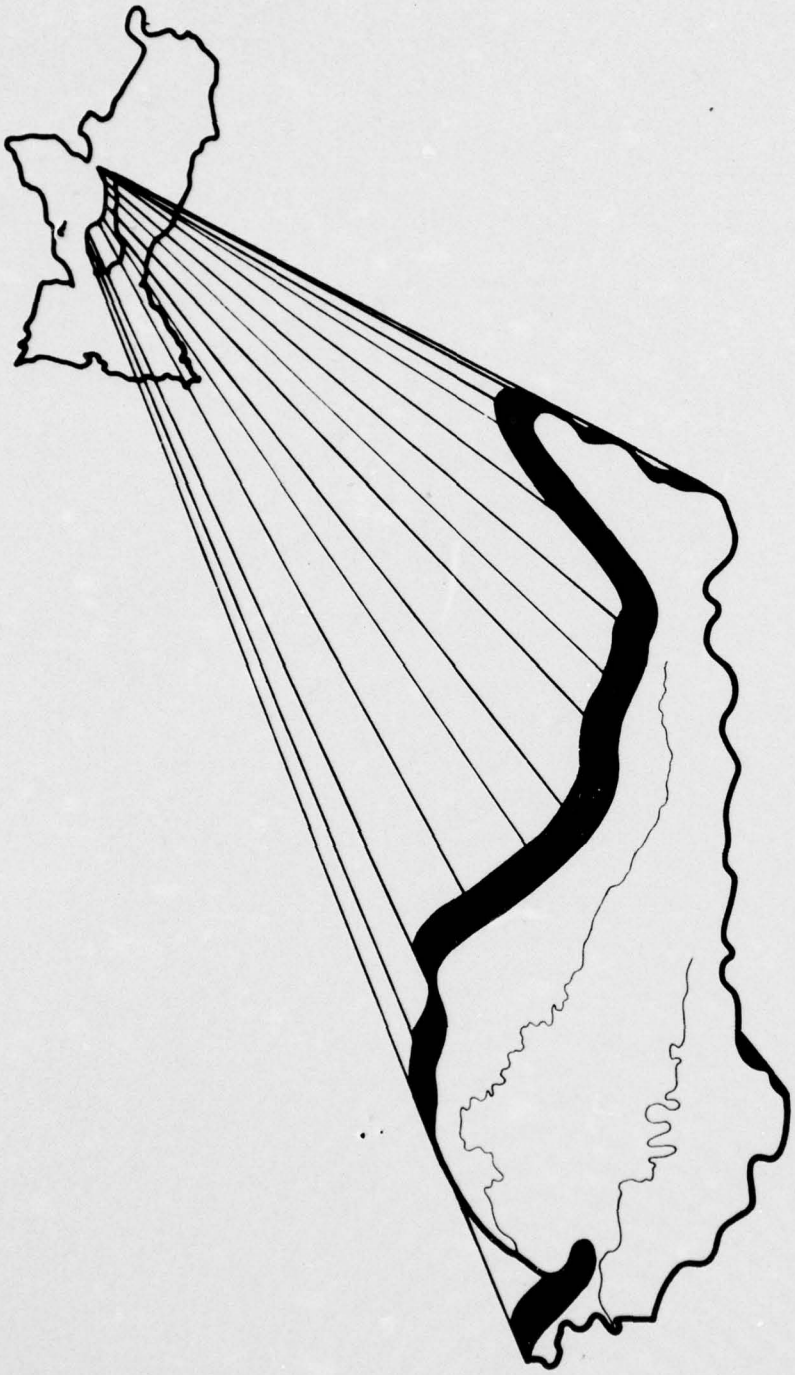
Unlike many other areas of the Lower Mississippi Region, WRPA 5 has not suffered population losses. This can be attributed to the fact that WRPA 5 has not been agriculturally oriented to the degree that some other areas of the Lower Mississippi Region have. Continued population increases are foreseen for the projection period (1968-2020). Although significant increases are expected, they will be less than the increases projected for the region or the Nation. Therefore, the area's percentage of the national population will decrease.

Personal income is expected to increase at rates faster than population throughout the projection period. Consequently, per capita income is expected to increase from 67 to 77 percent of the national average between 1969 and 2020.

Total earnings are projected to increase at rates lower than the projected national and regional rates through 2000. Between 2000 and 2020, the rate of growth in WRPA 5 is expected to exceed the national rate. The manufacturing industry is projected to be the major contributor to total earnings, while government, wholesale and retail trade, services, and agriculture will follow in order of total contributions. Continuous growth is forecast for all of these major industries except agriculture. In agriculture, a decrease in earnings is projected between 1968 and 1980 followed by continued increases through 2020.

Slow growth in employment is estimated for the 1968-1980 period. Between 1980 and 2020, employment is expected to accelerate but at rates less than those of the region or Nation.

In summary, sustained growth is projected for WRPA 5 in all sections. Although significant growth rates are expected, the economic development of WRPA 5 will continue to lag behind national and regional development.



# WRPA 6

# WRPA 6, BOEUF - TENSAS

## PHYSICAL DESCRIPTION

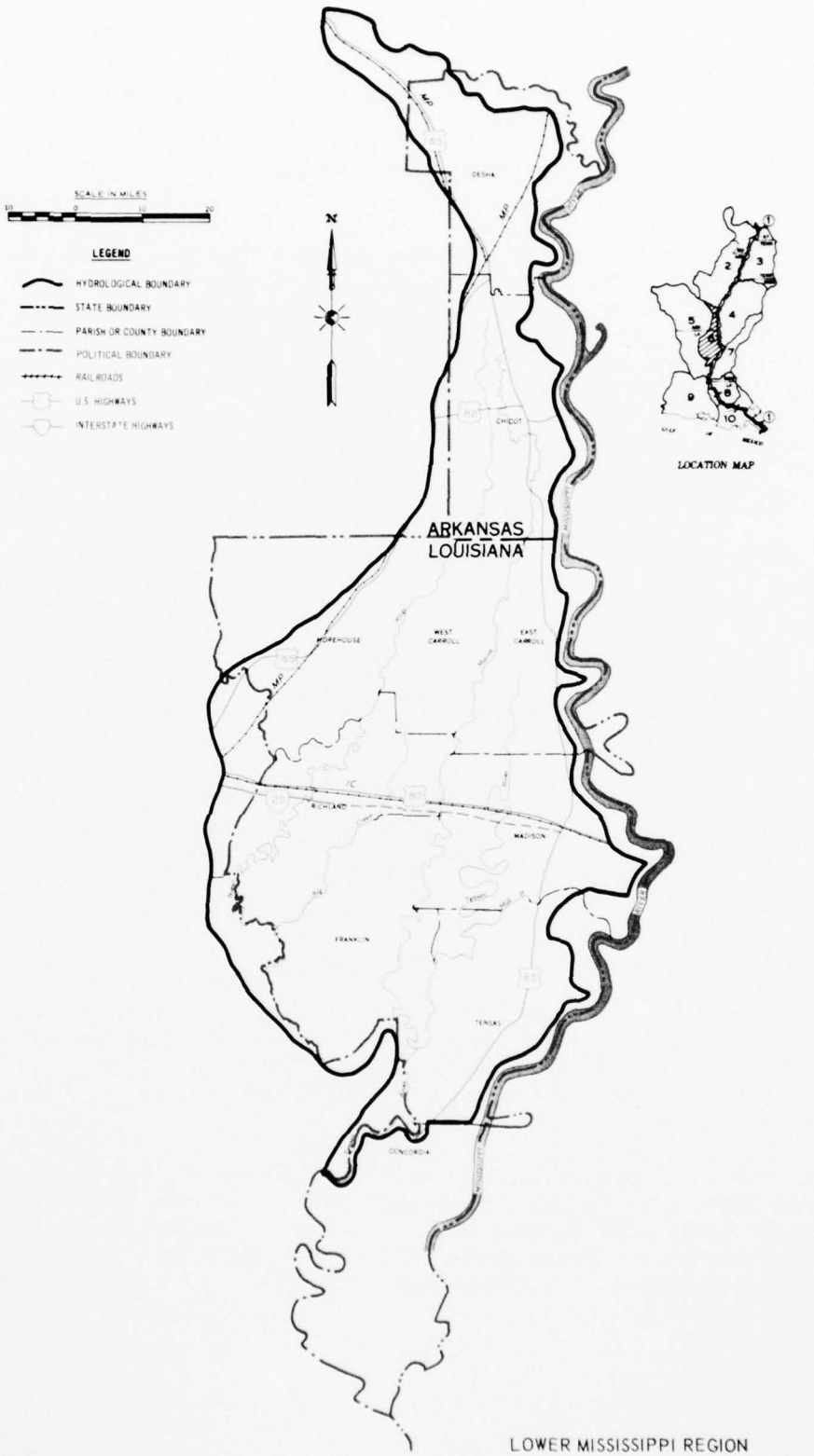
WRPA 6 (figure 15) comprises two Arkansas Counties and eight Louisiana Parishes for a total of 6,406 square miles. It is an extensive lowland area that lies to the west of the Mississippi River. The upper part of the area begins at about the latitude of Gould, Ark., and extends to the southern boundary of Concordia Parish, La. The upper part is relatively narrow at the northern extremity and gradually widens to about 65 miles in the latitude of Vicksburg, Miss. Further south, near the latitude of Sicily Island, La., the area constricts to a width of approximately 20 miles. The parishes and counties composing the WRPA lie within or are adjacent to the Boeuf-Tensas Basin.

The Boeuf and Tensas Rivers and Bayou Macon are contiguous and embrace that part of the alluvial valley of the Mississippi River lying west of the Mississippi River and east of the Ouachita River and its tributary, Bayou Bartholomew, between Pine Bluff, Ark., and Harrisonburg, La. The basin has an overall length of about 190 miles in a generally north-south direction and averages about 30 miles in width. There are 5,300 square miles in the basin, 1,350 in Arkansas, and 3,950 in Louisiana.

The surface of the area is generally flat, with a general slope from north to south, varying from about 1.25 ft/mile in the northern part to about 0.50 ft/mile in the southern part, except for the Macon and Bastrop Ridges. Macon Ridge traverses the central portion between Eudora, Ark., and Sicily Island, La. Bastrop Ridge is located on the western side of the basin, and extends from about 10 miles above Bastrop, La., to the vicinity of Monroe, La.

Except for the Macon and Bastrop Ridges, which are interglacial in origin, surface materials throughout the basin consist of recent alluvial deposits of silts, sands, and clays to depths of 10 to 80 ft. The alluvial deposits are generally very fertile and produce excellent crops when adequately drained.

Interior drainage within the basin is carried through a complex system of interconnected waterways which empty into the Ouachita River through the Boeuf and Tensas Rivers. Streams tributary to the Boeuf and Tensas Rivers and Bayou Macon include Big and Colewa Creeks, Bayou Lafourche, Big Bayou, Fleschmans Bayou, Caney Bayou, and Rush Bayou.




LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

**WATER RESOURCE PLANNING**
**AREA 6**

FIGURE 15

## ECONOMIC DESCRIPTION

### Natural Resources

WRPA 6 contains 4,099,840 acres. Fifty-six percent of the area is in farms, and 28.0 percent is in commercial forests not considered farmland. Approximately 2 percent is in urban areas.

The fertile soil in the area is the most valuable resource. The principal crops are cotton, soybeans, rice, corn, small grains, beef, and timber.

Commercial forest lands within the area amount to 1.5 million acres, almost 36 percent of the planning area. Essentially all of this is in private ownership. The most common types of timber in the area are oak-gum cypress, which occupies 79 percent of the forested area, and elm-ash-cottonwood, which occupies 11 percent.

The value of mineral production for the area in 1968 exceeded $69 million. Petroleum, natural gas, and natural gas liquids production accounted for almost 100 percent of the total. Concordia Parish was the greatest producer in the area, with 43 percent of the mineral production.

Fish and wildlife resources, formerly of great magnitude and abundance, are still extensive and make a considerable contribution to local and State economies. Sections of the Boeuf-Tensas area support major deer herds. All of the forested areas have good populations of small forest game and small fur bearers. Upland game birds and cottontail rabbits are hunted on agricultural lands. Migratory waterfowl are of seasonal importance when attracted to the food supply offered by flooded hardwood forests. Wood ducks are year-round residents of the area.

Streams, sloughs, and small lakes furnish good sport fishing. Commercial fishing has declined in recent years and is of minor importance.

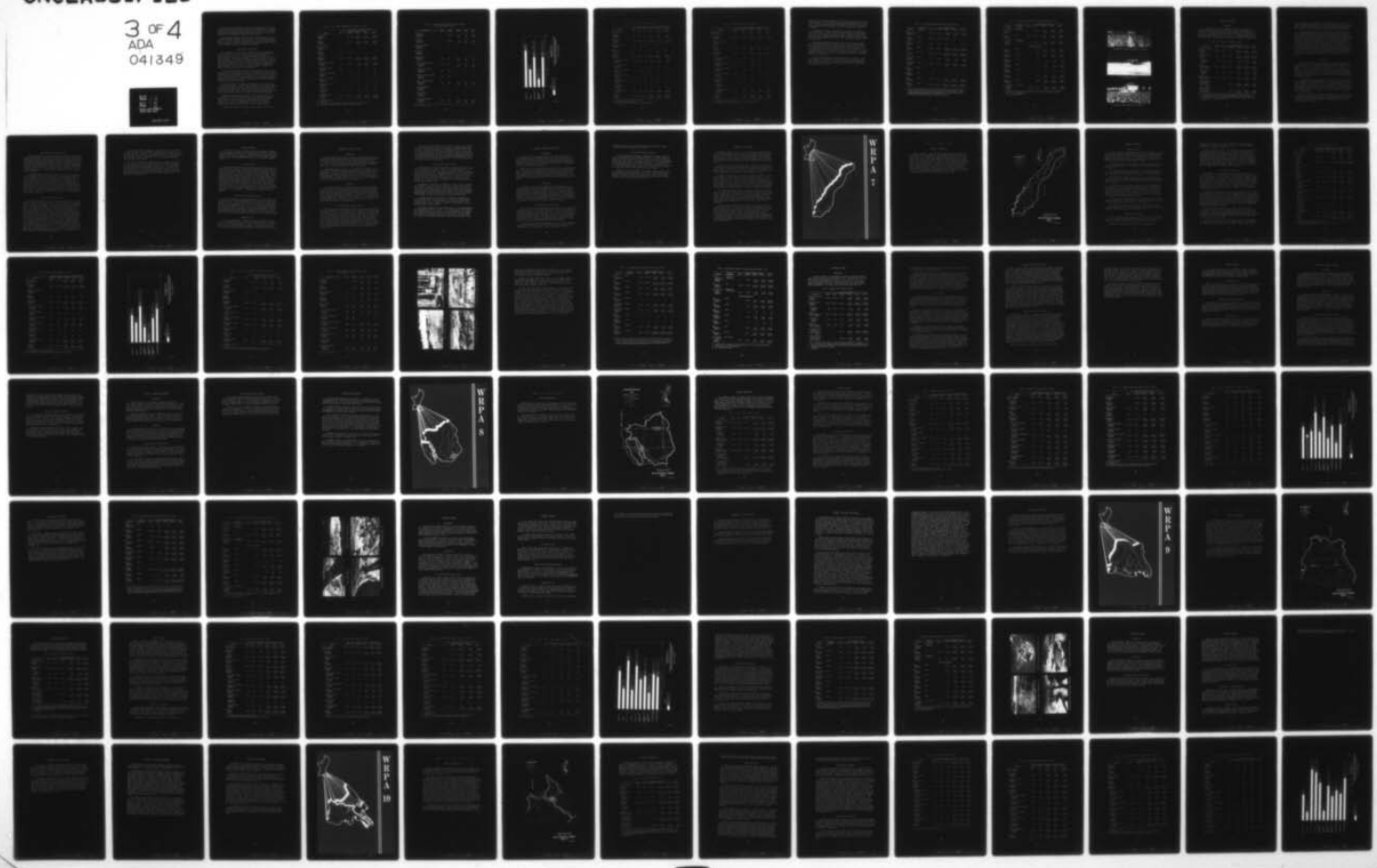
### Industrial Development

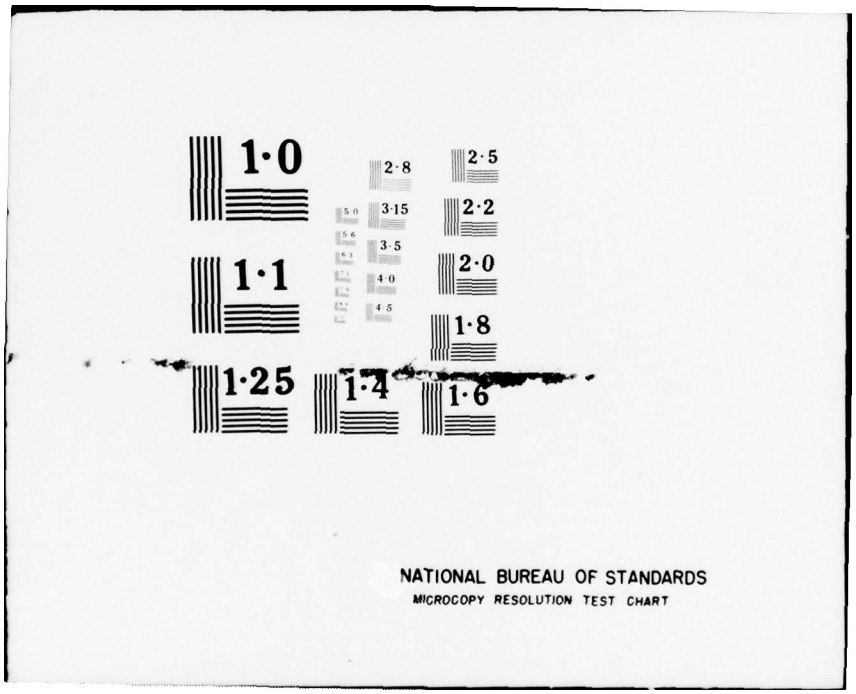
In 1967, there were 141 manufacturing establishments in the area, with a combined payroll of $10.4 million. These firms employed 2,900 people, 2,800 of whom were production workers. Over 25 percent of the establishments employed 20 or more workers, and 9 percent employed more than 100 persons. The value added by manufacturing increased 88 percent between 1963 and 1969.

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LOWER MISSISSIPPI REGION COMPREHENSIVE STUDY. APPENDIX B. ECONO--ETC(U)
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NATIONAL BUREAU OF STANDARDS
MICROCOPY RESOLUTION TEST CHART

Specific major water-using industries contributed little to gross production from manufacturing; instead, other manufacturing accounted for about 94 percent (see tables 61 and 62 and figure 16). Principal among the other manufacturing industries were the lumber and furniture industry and the apparel and other textiles industry.

Manufacturing earnings accounted for over 23 percent of total earnings in WRPA 6 in 1968. Over 94 percent of manufacturing earnings were in the "other manufacturing" category. A more detailed presentation of earnings by specific industries is prohibited because it would entail disclosing company confidential information.

## Agricultural Development

The abundance of fertile land in WRPA 6 is the most valuable resource of the area, as reflected in the fact that agriculture is the major industry in the area. Earnings and employment values in tables 63 and 64 indicate the dominant effect of agriculture on the area's economy. For example, agriculture earnings of $103.2 million in 1968 represented over one-third of total earnings in WRPA 6. The proportion was even larger in 1959. Although agricultural employment for the area declined due to vast mechanization within the industry, it still accounted for 32.5 percent of total employment in WRPA 6 for 1960, far more than any other single industry.

Land in farms accounted for 56 percent of WRPA 6 in 1970. There were 7,144 farms in the area in 1970, as compared with 12,761 in 1959. Average farm size increased from 184 acres in 1959 to 322 acres in 1970. Over 75 percent of the farms were commercial in 1970, which reflects a slight decline from 1959. Between 1949 and 1970, the number of farms decreased 73 percent, average size increased 297 percent, and amount of land in farms increased 7 percent.

Most of the farms are commercial and produce a variety of crops and livestock products. Agricultural output of this area ranks fifth in the Lower Mississippi Region. Farms in WRPA 6 rank second in size in the region. Most of the farms are field crop farms, with cotton being the predominant crop. Tenant-operated farms predominated in 1949 and 1954; since 1959, however, full-owner farms have predominated.

Cropland accounted for 50 percent of all farmland in 1959, and 61 percent in 1970. The amount of farm forest land, approximately half of which is pastured, declined from 995,000 acres in 1949 to 326,000 acres in 1970. Permanent pastureland increased from 118,000 acres in 1949 to 340,000 acres in 1970. Other farmland accounted for approximately 4 percent of total land in farms.

Soybeans and cotton are the major crops harvested in the area.

Table 61 - Gross Product Originating by Major Industries in WRPA 6

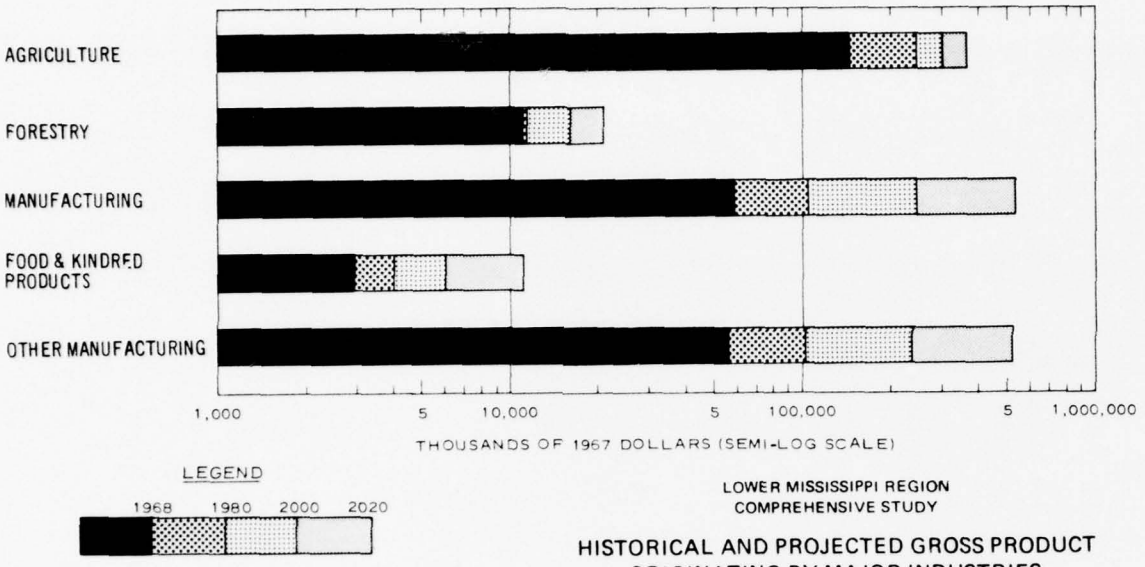
| Industry | Gross Product Originating in Indicated Years thousands of 1967 dollars | | | | |
|---|---|---|---|---|---|
| | 1967 | 1968 | 1980 | 2000 | 2020 |
| Agriculture 1/ | | | | | |
| Program A | -- | 143,715 2/ | 244,000 | 283,000 | 335,000 |
| Program B | -- | -- | 244,000 | 304,000 | 360,000 |
| Forestry 3/ | | | | | |
| Program A | -- | 11,200 2/ | 10,000 | 14,000 | 16,000 |
| Program B | -- | -- | 11,000 | 16,000 | 21,000 |
| Mining, Petroleum | | | | | |
| Program A | -- | -- | -- | -- | -- |
| Program B | -- | -- | -- | -- | -- |
| Quarrying | | | | | |
| Program A | 738 | 502 | -- | -- | -- |
| Program B | -- | -- | -- | -- | -- |
| Manufacturing | | | | | |
| Program A | 58,307 | 58,890 | 96,000 | 209,000 | 451,000 |
| Program B | -- | -- | 105,000 | 242,000 | 532,000 |
| Food & Kindred Products | | | | | |
| Program A | 2,663 | 2,983 | 3,000 | 5,000 | 9,000 |
| Program B | -- | -- | 4,000 | 6,000 | 11,000 |
| Textile Mill Products | | | | | |
| Program A | W 4/ | W | W | W | W |
| Program B | -- | -- | W | W | W |
| Chemical & Allied Products | | | | | |
| Program A | 758 | 758 | W | W | W |
| Program B | -- | -- | W | W | W |
| Paper & Allied Products | | | | | |
| Program A | W | W | W | W | W |
| Program B | -- | -- | W | W | W |
| Petroleum Refining | | | | | |
| Program A | W | W | W | W | W |
| Program B | -- | -- | W | W | W |
| Primary Metals | | | | | |
| Program A | W | W | W | W | W |
| Program B | -- | -- | W | W | W |
| Other Manufacturing | | | | | |
| Program A | 54,886 | 55,149 | 93,000 | 204,000 | 442,000 |
| Program B | -- | -- | 101,000 | 236,000 | 521,000 |

1/ Marketing receipts.
2/ 1970 data.
3/ Value at local point of delivery including stumpage, cutting, and hauling.
4/ W—Withheld to avoid disclosing company confidential information.

Table 62 - Index of Output by Major Industries, WRPA 6
Boeuf-Tensas (1967 = 100)

| Industry | 1967 | 1968 | 1980 | 2000 | 2020 |
|---|---|---|---|---|---|
| Agriculture | | | | | |
| Program A | -- | 100 1/ | 170 | 197 | 233 |
| Program B | -- | -- | 170 | 212 | 250 |
| Forestry | | | | | |
| Program A | -- | 100 1/ | 93 | 129 | 139 |
| Program B | -- | -- | 98 | 140 | 187 |
| Mining, Petroleum | | | | | |
| Program A | -- | -- | -- | -- | -- |
| Program B | -- | -- | -- | -- | -- |
| Quarrying | | | | | |
| Program A | -- | -- | -- | -- | -- |
| Program B | -- | -- | -- | -- | -- |
| Manufacturing | | | | | |
| Program A | 100 | 101 | 164 | 359 | 773 |
| Program B | -- | -- | 180 | 415 | 912 |
| Food & Kindred Products | | | | | |
| Program A | 100 | 112 | 122 | 197 | 336 |
| Program B | -- | -- | 157 | 228 | 396 |
| Textile Mill Products | | | | | |
| Program A | 100 | 114 | -- | -- | -- |
| Program B | -- | -- | -- | -- | -- |
| Chemical & Allied Products | | | | | |
| Program A | 100 | 100 | -- | -- | -- |
| Program B | -- | -- | -- | -- | -- |
| Paper & Allied Products | | | | | |
| Program A | 100 | 100 | 150 | 301 | 620 |
| Program B | -- | -- | 164 | 348 | 731 |
| Petroleum Refining | | | | | |
| Program A | -- | -- | -- | -- | -- |
| Program B | -- | -- | -- | -- | -- |
| Primary Metals | | | | | |
| Program A | -- | -- | -- | -- | -- |
| Program B | -- | -- | -- | -- | -- |
| Other Manufacturing | | | | | |
| Program A | 100 | 100 | 168 | 372 | 805 |
| Program B | -- | -- | 185 | 430 | 949 |

1/ 1970 used as base.




LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

HISTORICAL AND PROJECTED GROSS PRODUCT
ORIGINATING BY MAJOR INDUSTRIES

WRPA 6 PROGRAM B

FIGURE 16

Table 63 - Earnings by Major Industries in WRPA 6

| Industry | Earnings for Indicated Years, thousands of 1967 dollars | | | | | |
|---|---|---|---|---|---|---|
| | 1950 | 1959 | 1968 | 1980 | 2000 | 2020 |
| Total, Program A | 166,757 | 204,114 | 291,337 | 344,000 | 710,000 | 1,554,000 |
| Total, Program B | -- | -- | -- | 378,000 | 821,000 | 1,833,000 |
| Per Worker 1/ | | | | | | |
| Program A | 2,610 | 3,827 | 5,416 | 6,595 | 12,479 | 23,349 |
| Program B | -- | -- | -- | 6,595 | 12,479 | 23,349 |
| Agriculture | | | | | | |
| Program A | 65,791 | 73,890 | 103,237 | 60,000 2/ | 75,000 2/ | 129,000 2/ |
| Program B | -- | -- | -- | 65,000 2/ | 87,000 2/ | 152,000 2/ |
| Forestry & Fisheries | | | | | | |
| Program A | 938 | 920 | 452 | -- | -- | -- |
| Program B | -- | -- | -- | -- | -- | -- |
| Mining | | | | | | |
| Program A | W 3/ | W | W | W | W | W |
| Program B | -- | -- | -- | W | W | W |
| Manufacturing | | | | | | |
| Program A | 24,320 | 24,289 | 35,869 | 58,000 | 123,000 | 262,000 |
| Program B | -- | -- | -- | 63,000 | 143,000 | 308,000 |
| Food & Kindred Products | | | | | | |
| Program A | 1,329 | 1,492 | 1,682 | 2,000 | 3,000 | 5,000 |
| Program B | -- | -- | -- | 2,000 | 3,000 | 6,000 |
| Textile Mill Products | | | | | | |
| Program A | 0 | 0 | 0 | W | W | W |
| Program B | -- | -- | -- | W | W | W |
| Chemical & Allied Products | | | | | | |
| Program A | 352 | 406 | 329 | W | W | W |
| Program B | -- | -- | -- | W | W | W |
| Paper & Allied Products | | | | | | |
| Program A | W | W | W | W | W | W |
| Program B | -- | -- | -- | W | W | W |
| Petroleum Refining | | | | | | |
| Program A | W | W | W | W | W | W |
| Program B | -- | -- | -- | W | W | W |
| Primary Metals | | | | | | |
| Program A | W | W | W | W | W | W |
| Program B | -- | -- | -- | W | W | W |
| Other Manufacturing | | | | | | |
| Program A | 22,639 | 22,391 | 33,858 | 56,000 | 120,000 | 257,000 |
| Program B | -- | -- | -- | 61,000 | 139,000 | 303,000 |
| All Other | | | | | | |
| Program A | 75,708 | 105,015 | 151,779 | 226,000 | 512,000 | 1,163,000 |
| Program B | -- | -- | -- | 250,000 | 591,000 | 1,373,000 |

1/ Per worker earnings are given in 1967 dollars.
2/ Includes forestry & fisheries data.
3/ W—Withheld to avoid disclosing company confidential information.

Table 64 - Employment by Major Industries in WRPA 6

| Industry | Number of Persons Employed in Indicated Years | | | | |
|---|---|---|---|---|---|
| | 1950 | 1960 | 1980 | 2000 | 2020 |
| Total, Program A | 63,889 | 53,340 | 52,000 | 57,000 | 67,000 |
| Total, Program B | -- | -- | 57,000 | 66,000 | 78,000 |
| Agriculture | | | | | |
| Program A | 34,214 1/ | 17,322 1/ | 7,600 1/ | 5,700 1/ | 5,600 1/ |
| Program B | -- | -- | 7,600 1/ | 6,200 1/ | 6,000 1/ |
| Forestry & Fisheries | | | | | |
| Program A | -- | -- | -- | -- | -- |
| Program B | -- | -- | -- | -- | -- |
| Mining | | | | | |
| Program A | 579 | 844 | 1,600 | 2,100 | 2,600 |
| Program B | -- | -- | 1,800 | 2,400 | 3,100 |
| Manufacturing | | | | | |
| Program A | 5,970 | 6,515 | 7,800 | 9,400 | 11,400 |
| Program B | -- | -- | 8,600 | 10,900 | 13,500 |
| Food & Kindred Products | | | | | |
| Program A | 299 | 496 | 280 | 250 | 240 |
| Program B | -- | -- | 310 | 290 | 290 |
| Textile Mill Products | | | | | |
| Program A | 12 | 10 | W 2/ | W | W |
| Program B | -- | -- | W | W | W |
| Chemical & Allied Products | | | | | |
| Program A | 196 | 166 | W | W | W |
| Program B | -- | -- | W | W | W |
| Paper & Allied Products | | | | | |
| Program A | 2,371 | 2,328 | W | W | W |
| Program B | -- | -- | W | W | W |
| Petroleum Refining | | | | | |
| Program A | 10 | 333 | W | W | W |
| Program B | -- | -- | W | W | W |
| Primary Metals | | | | | |
| Program A | 3 | 4 | W | W | W |
| Program B | -- | -- | W | W | W |
| Other Manufacturing | | | | | |
| Program A | 3,079 | 3,178 | 7,500 | 9,200 | 11,000 |
| Program B | -- | -- | 8,300 | 11,000 | 13,000 |
| All Other | | | | | |
| Program A | 23,126 | 28,659 | 35,000 | 39,600 | 46,900 |
| Program B | -- | -- | 39,000 | 46,000 | 55,000 |

1/ Includes forestry & fisheries data.
2/ W—Withheld to avoid disclosing company confidential information.

Together, these crops accounted for over 86 percent of total crop acreages harvested in 1970. Soybean acreage alone constituted over 58 percent. In 1959, in comparison, cotton acreage contributed most to total acres harvested with 36 percent, and soybean acreage was second with 31 percent.

Livestock and poultry enterprises are not nearly so important as crop enterprises. In 1970, there were approximately 507 farms classified as livestock, dairy, and poultry farms. During the period 1949-1970, there was an upward trend in the sale of cattle and calves, eggs, and milk, but a downward trend in the sale of chickens, turkeys, broilers, and cream.

Agricultural production values for specific crops and livestock and livestock products are shown in table 65. These values reflect once again the significance of soybeans and cotton (as well as rice) to total production. Between 1959 and 1970, the major increases in crop production occurred in soybeans, cotton, wheat, and rice, as they increased 213.8, 62.9, 25.8, and 22.4 percent, respectively. The most significant decreases occurred in the production of corn (78.6 percent) and oats (31.7 percent).

In 1970, farm marketing receipts totaled $143.7 million. Field crops accounted for 89 percent of the total, and livestock and livestock products 11 percent. Total gross farm income was approximately $167.1 million, realized net income approximately $50.1 million, and net income per farm $7,017.

Table 65 - Agricultural Production (Crops and Livestock) in WRPA 6

| Commodity | Unit of Measurement | Data for Indicated Years 1959 | 1970 | 1980 | 2000 | 2020 |
|---|---|---|---|---|---|---|
| Cotton | Bales | | | | | |
| Program A 1/ | | 316,838 | 516,249 | 733,000 | 797,000 | 861,000 |
| Program B 1/ | | -- | -- | 733,000 | 856,000 | 924,000 |
| Corn | Bushels | | | | | |
| Program A | | 2,797,804 | 600,000 | W 2/ | W | W |
| Program B | | -- | -- | W | W | W |
| Sorghum | Bushels | | | | | |
| Program A | | 89,278 | 55,500 | W | W | W |
| Program B | | -- | -- | W | W | W |
| Oats | Bushels | | | | | |
| Program A | | 1,384,437 | 946,000 | 984,000 | 1,016,000 | 1,053,000 |
| Program B | | -- | -- | 984,000 | 1,092,000 | 1,131,000 |
| Rice | Bushels | | | | | |
| Program A | | 1,909,484 | 2,337,696 | 3,640,000 | 4,292,000 | 5,107,000 |
| Program B | | -- | -- | 3,640,000 | 4,611,000 | 5,485,000 |
| Irish Potatoes | Bushels | | | | | |
| Program A | | 32,480 | 9,000 | 5,000 | 6,000 | 8,000 |
| Program B | | -- | -- | 5,000 | 7,000 | 9,000 |
| Sweet Potatoes | Bushels | | | | | |
| Program A | | 488,508 | 360,000 | 380,000 | 394,000 | 494,000 |
| Program B | | -- | -- | 380,000 | 424,000 | 531,000 |
| Tobacco | Pounds | | | | | |
| Program A | | 0 | 0 | 0 | 0 | 0 |
| Program B | | -- | -- | 0 | 0 | 0 |
| Sugarcane | Tons | | | | | |
| Program A | | 108 | 0 | 0 | 0 | 0 |
| Program B | | -- | -- | 0 | 0 | 0 |
| Wheat | Bushels | | | | | |
| Program A | | 670,632 | 843,960 | 3,533,000 | 4,227,000 | 4,688,000 |
| Program B | | -- | -- | 3,533,000 | 4,541,000 | 5,035,000 |
| Soybeans | Bushels | | | | | |
| Program A | | 5,975,791 | 18,750,000 | 24,930,000 | 31,454,000 | 42,588,000 |
| Program B | | -- | -- | 24,930,000 | 33,789,000 | 45,734,000 |

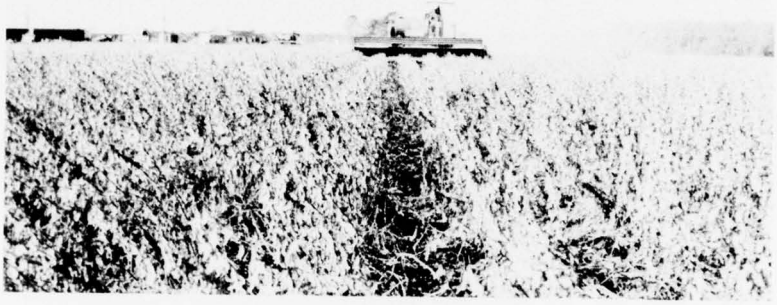
1/ Program A data incorporates 1970 production estimates; Program B data reflect the projected national growth rate shown in Table II-18, Selected National Aggregates, Volume 1, Economic Activity in the United States by Water Resources Regions and Subareas, Historical and Projected, 1929-2020, pages II-18 through II-22.

2/ W—Withheld to avoid disclosing company confidential information.

Table 65 - Agricultural Production (Crops and Livestock) in WRPA 6 (Con.)

| Commodity | Unit of Measurement | Data for Indicated Years 1959 | 1970 | 1980 | 2000 | 2020 |
|---|---|---|---|---|---|---|
| Forest Products 3/ | Thousands of Cubic Feet | | | | | |
| Program A | | -- | 53,800 | 50,000 | 69,000 | 75,000 |
| Program B | | -- | -- | 53,000 | 76,000 | 101,000 |
| Hay | Tons | | | | | |
| Program A | | 98,752 | 107,068 | 145,000 | 179,000 | 220,000 |
| Program B | | -- | -- | 145,000 | 192,000 | 237,000 |
| Gross Value of Crops | Thousands of 1967 Dollars | | | | | |
| Program A | | 74,575 | 128,050 | 220,000 | 252,000 | 294,000 |
| Program B | | -- | -- | 220,000 | 270,000 | 316,000 |
| | | Livestock Thousands 4/ | | | | |
| Beef | Pounds | | | | | |
| Program A | | -- | 65,166 | 82,931 | 111,630 | 149,917 |
| Program B | | -- | -- | 82,931 | 119,917 | 160,993 |
| Pork | Pounds | | | | | |
| Program A | | -- | 7,494 | 8,527 | 11,137 | 14,457 |
| Program B | | -- | -- | 8,527 | 11,964 | 15,525 |
| Lamb | Pounds | | | | | |
| Program A | | -- | 71 | 54 | 64 | 78 |
| Program B | | -- | -- | 54 | 69 | 84 |
| Chickens | Pounds | | | | | |
| Program A | | -- | 430 | 599 | 836 | 1,123 |
| Program B | | -- | -- | 599 | 898 | 1,206 |
| Turkeys | Pounds | | | | | |
| Program A | | -- | 46 | 61 | 86 | 116 |
| Program B | | -- | -- | 61 | 92 | 125 |
| Eggs | Dozen | | | | | |
| Program A | | -- | 3,654 | 4,000 | 5,121 | 6,486 |
| Program B | | -- | -- | 4,000 | 5,501 | 6,965 |
| Milk | Pounds | | | | | |
| Program A | | -- | 44,980 | 41,240 | 50,901 | 62,164 |
| Program B | | -- | -- | 41,240 | 54,680 | 66,757 |
| Gross Value of Livestock | 1967 Dollars | | | | | |
| Program A | | 20,830 | 15,665 | 23,580 | 31,324 | 41,480 |
| Program B | | -- | -- | 23,580 | 33,650 | 44,546 |

3/ Includes sawlogs, veneer logs, pulpwood, poles, etc., cut for industrial or consumer uses. (U. S. Forest Service.)
4/ Net liveweight production.



Mechanically harvesting soybeans in WRPA 6



Crop dusting in WRPA 6



Picking cotton mechanically in WRPA 6

## HISTORICAL TRENDS

### Population

As shown in table 66, the population of WRPA 6 has declined continuously from the 1950 figure of 215,000 persons. A decrease of 8.1 percent occurred between 1950 and 1959, the period of greatest decrease, as the population fell to 197,600. The downward trend continued through 1970 resulting in a decrease of 4.9 percent during the 1959-1970 period and a 1970 population of 188,000. The present composition

Table 66 - Economic Profile Summary for WRPA 6

| Parameter | Data for Indicated Years | | | | | |
|---|---|---|---|---|---|---|
| | 1950 | 1959 | 1968 | 1980 | 2000 | 2020 |
| Population (1 July) 1/ | | | | | | |
| Program A | 214,955 | 197,601 | 193,490 | 179,000 | 179,000 | 193,000 |
| Program B | -- | -- | -- | 191,000 | 188,000 | 212,000 |
| Personal Income 2/ | | | | | | |
| Program A | 205,269 | 249,950 | 379,251 | 482,000 | 975,000 | 2,056,000 |
| Program B | -- | -- | -- | 529,000 | 1,128,000 | 2,424,000 |
| Per Capita 2/ | | | | | | |
| Program A | 955 | 1,265 | 1,960 | 2,688 | 5,462 | 10,662 |
| Program B | -- | -- | -- | 2,771 | 6,003 | 11,428 |
| Earnings 2/ | | | | | | |
| Total, Program A | 166,757 | 204,114 | 291,337 | 344,000 | 710,000 | 1,554,000 |
| Total, Program B | -- | -- | -- | 378,000 | 821,000 | 1,833,000 |
| Per Worker 2/ | | | | | | |
| Program A | 2,610 | 3,827 | 5,416 | 6,595 | 12,479 | 23,349 |
| Program B | -- | -- | -- | 6,595 | 12,479 | 23,349 |
| Employment | | | | | | |
| Total, Program A | 63,889 | 53,340 | 53,700 | 52,000 | 57,000 | 67,000 |
| Total, Program B | -- | -- | -- | 57,000 | 66,000 | 78,000 |
| Gross Manufacturing Product 2/ | | | | | | |
| Total, Program A | -- | -- | 58,890 | 96,000 | 209,000 | 451,000 |
| Total, Program B | -- | -- | -- | 105,000 | 242,000 | 532,000 |
| Gross Farm Marketing Receipts 2/ | | | | | | |
| Total, Program A | -- | -- | 143,715 3/ | 244,000 | 283,000 | 335,000 |
| Total, Program B | -- | -- | -- | 244,000 | 304,000 | 360,000 |

1/ U. S. Bureau of Census figures show the 1970 population of WRPA 6 as 188,395.
2/ Personal income, total earnings, gross manufacturing product, and gross farm marketing receipt data are given in thousands of 1967 dollars; per capita income and per worker earnings are given in 1967 dollars.
3/ 1970 data.

of the population is approximately 61.0 percent rural and 39.0 percent urban. Although population losses have been continuous since 1950, the rate of decrease has slackened (less than 0.5 percent annually between 1959 and 1970, as compared with 0.9 percent between 1950 and 1959).

Like many other areas within this general region, WRPA 6 experienced a significant migration of displaced farm labor as the agricultural industry became more mechanized. Unlike many areas, however, WRPA 6 has not had a large influx of new industry nor a rapid expansion of existing industry, which is necessary to provide the additional jobs needed to retain the displaced workers. The data in the preceding paragraph reflect the overwhelming effect of agricultural labor losses on the area's population between 1950 and 1959. As agricultural labor losses diminished during the 1959-1970 period, the population loss also declined. Had other industries advanced, as in other geographical areas, the population of WRPA 6 probably would have increased between 1959 and 1970. WRPA 6 has made significant strides in the agricultural sector of its economy which have not been matched by rapid advances elsewhere due to physical, technological, sociological, and other factors.

## Employment

The employment situation for WRPA 6 has been worse than in other geographical areas. For example, employment in WRPA 6 remained almost constant between 1959 and 1968, increasing less than 1 percent (see table 66). This compares with increases of 10 to 15 percent in WRPA's 4, 5, and 7. During the previous period (1950-1959) employment in WRPA 6 declined from 63,900 to 53,300, or 16.6 percent, a decrease well above that in other areas. As discussed earlier, the movement to agricultural mechanization has had a substantial negative effect upon employment in WRPA 6.

The employment values presented in table 64 indicate that employment in agriculture and manufacturing, the two major water-using industries in WRPA 6, represented 32.5 and 12.2 percent, respectively, of total employment in the area in 1960. The greatest change in employment occurred in agriculture, as indicated by the decline from 34,200 agricultural workers in 1950 to 17,300 in 1960, a 49.4 percent decrease. Manufacturing employment increased 9.1 percent (from 5,970 to 6,515) during the period.

There was an absolute increase in employment of 5,533 in all other industries during the 1950-1960 period. When compared with the absolute decrease of 16,892 in agricultural employment, these values reflect once again the void created by agricultural labor losses unmatched by gains elsewhere.

## Personal and Per Capita Income

As shown in table 66, total personal income in WRPA 6 increased from $205.3 million in 1950 to $379.3 million in 1968, or 84.8 percent. Almost three-fourths of this increase occurred in the latter ten years. The annual growth rate between 1950 and 1959 was approximately 2.2 percent, and was restricted partially by the negative effects of decreasing employment and population. Between 1959 and 1968, in comparison, personal income increased 4.7 percent annually. Although part of this increase resulted from a small increase in employment, most of it resulted from greater use of skilled and semiskilled labor as a part of total employment.

Per capita income for WRPA 6 in 1968 was $1,960, or 59.0 percent of the national average. It increased 32.5 percent between 1950 and 1959, although a third of this increase was attributable to the 8.1 percent decrease in the area's population. In contrast, the per capita income increased 54.9 percent between 1959 and 1968, over 94.1 percent of which was due to actual increases in total personal income as more jobs requiring skilled and semiskilled laborers became available in the area. Thus, the per capita income for the area increased from 46.0 percent of the national average in 1950 to 59.0 percent in 1968. Much of the early increase was due to population loss; however, most of the recent increase resulted from actual increases in total personal income.

## Total and Per Worker Earnings

Total earnings in WRPA 6 increased from $166.8 million in 1950 to $291.3 million in 1968 (see table 63). This represents a 74.6 percent increase, almost three-fourths of which occurred during the 1959-1968 period. Earnings in agriculture and manufacturing accounted for 35.4 and 12.3 percent, respectively, of the total earnings in WRPA 6 in 1968. These values do not differ greatly from the 39.5 and 14.6 percent for agriculture and manufacturing in 1950, thus indicating that these industries have almost, but not completely, remained unchanged as contributors to total earnings since 1950. Agricultural earnings did increase 12.3 and 39.7 percent, respectively, during the 1950-1959 and 1959-1968 periods, whereas other areas in the region experienced decreases in agricultural earnings during the period. However, other areas showed substantial increases in manufacturing earnings from 1950 to 1959, whereas WRPA 6 had constant manufacturing earnings for the period followed by an increase of 47.7 percent between 1959 and 1968. These values indicate that agriculture, as a contributor to total earnings, has not declined in WRPA 6 as in other areas. But they also indicate that manufacturing has not achieved an increased proportion of total earnings as in other geographical areas.

All other industries accounted for 52.1 percent of total earnings in WRPA 6 in 1968. Major percentage contributions by industries in this category were as follows: (a) government, 15.3 percent; (b) wholesale and retail trade, 13.3 percent; and (c) services, 8.2 percent. In 1959 (a), (b), and (c) accounted for 12.8, 13.8, and 8.1 percent of total earnings, respectively.

Per worker earnings were $5,416 in 1968, as compared with $3,827 in 1959, an increase of 41.5 percent during the period. The annual rate of increase was fairly steady, being 4.3 and 3.9 percent during the 1950-1959 and 1959-1968 periods, respectively. Per worker earnings increased from 58.0 percent of the national average in 1950 to 71.0 percent in 1959 and to 81.0 percent in 1968. These values again reflect the increase in skilled and semiskilled employment as a proportion of total employment.

## ECONOMIC PROBLEMS

As of July 1971, nine of the ten parishes and counties in WRPA 6 were designated as eligible for assistance under the Public Works and Economic Development Act of 1965. Qualification of these parishes and counties, based on high unemployment and/or low median family incomes, permits them to obtain Federal aid in efforts to stimulate economic growth.

### Low Income Levels

Per capita income in WRPA 6 has been restricted by the large proportion of basic industries requiring unskilled labor in the area. In 1940, the per capita income in the area was only 46.0 percent of the national average; by 1968, it had increased to 59.0 percent. Agriculture, historically the dominant industry in the area's economy (and an unskilled labor industry), has experienced a continuous decline in employment resulting from the transition to more mechanized methods. WRPA 6 has been hurt more severely than many other areas by the decline in agricultural employment principally because offsetting increases have not been made by other industries to the extent that they have been made in other areas. The need exists for more skilled and semi-skilled employment to offset the large amount of unskilled employment in the area. This means that development of existing industry in the area needs to be accompanied by a substantial introduction of new industry.

### Unemployment and Underemployment

As in many other areas with agriculturally oriented economies, the transition to more mechanized methods has left many farm workers unemployed in WRPA 6. Latest figures show that unemployment in the area is 6 percent. Underemployment for the area is also high, reflecting the low per capita income of the area. As the per capita income for WRPA 6 moves upward toward the national average, the underemployment for the area should diminish. That part of the unemployment problem resulting from displaced agricultural workers should also diminish since the greatest decline in agricultural labor appears to have already occurred.

### Population Loss

WRPA 6 has experienced a continuous decline in population since 1950. As indicated previously, this loss represents more of a national problem than a problem for WRPA 6. Many of the people who leave the area find a more dismal situation elsewhere. The result may be increased economic and sociological problems in other areas of the Nation.

## PROGRAM A, NATIONAL INCOME

### Population

Program A projections indicate that the population of WRPA 6 will continue to decline through 1980, will remain stable between 1980 and 2000, and will gradually increase after 2000 (see table 66). The 2.1 percent decrease between 1959 and 1968 compares with a projected decrease of 7.5 percent between 1968 and 1980, no change from 1980 to 2000, and a 7.8 percent increase between 2000 and 2020.

Population changes for the area are substantially different from those of the Nation and Lower Mississippi Region. For example, as the population is decreasing in WRPA 6 between 1968 and 1980, it will be increasing 17.2 percent nationally and 7.1 percent regionally. The stable population of the area between 1980 and 2000 also contrasts significantly with a national increase of 31.0 percent and a regional increase of 21.0 percent during the same period.

### Employment

The employment values presented in table 66 show that a decrease of 3.3 percent is expected in employment between 1968 and 1980 under Program A. This decline represents a gradual downward trend from the stable employment in the area during the preceding period (1959-1968). After 1980, the employment is expected to increase at an accelerating rate, as indicated by growth rates of 0.5 and 0.8 percent annually during the 1980-2000 and 2000-2020 periods, respectively. Therefore, the 1968 employment total of 53,700 workers will decrease to 52,000 in 1968, but will increase to 67,000 in 2020.

### Personal and Per Capita Income

As shown in table 66, Program A projections indicate that the 1968 total personal income of $379.3 million will increase to $482.0 million in 1980, an increase of 27.1 percent. This represents an increase below the 51.7 percent of the previous period (1959-1968). It also indicates an annual growth rate of 2.0 percent, a rate well below that of the Nation (4.5 percent) and the Lower Mississippi Region (3.8 percent). However, growth rates after 1980 will begin to approach but still remain below the national and regional rates of 4.1 to 4.2 percent. Overall, Program A projections indicate that the upward trend in total personal income will continue through 1980 at a rate below that of the 1959-1968 period, and will then rise at an increasing rate through 2020.

Per capita income in WRPA 6 is projected to increase from $1,960 in 1968 to $2,688 in 1980, or 37.1 percent. The annual growth rate of 2.7 percent during this period will be followed by rates of 3.6 and 3.4 percent during the 1980-2000 and 2000-2020 periods, respectively. As discussed previously, the per capita income in WRPA 6 has moved upward toward the national average. A general continuation of this trend is expected under Program A, resulting in per capita incomes for the area that are 56.0, 66.0, and 75.0 percent of the national average in 1980, 2000, and 2020, respectively.

## Total and Per Worker Earnings

Data presented in table 63 show that a continuation of the upward trend in earnings is expected in WRPA 5. The 1968 earnings of $291.3 million are projected to increase to $344.0 million in 1980, an increase of 18.1 percent. The annual growth rate of 1.4 percent during this period, however, was substantially below the 4.0 percent of the preceding period (1959-1968). While the rates in WRPA 6 are below those of the Nation and Lower Mississippi Region during the earlier periods, the 2000-2020 rate of 4.0 percent is essentially equal to the national and regional rates.

Agricultural earnings as a percentage of total earnings in WRPA 6 are projected to decrease from 35.4 percent in 1968 to 17.4 percent in 1980 and to 8.3 percent in 2020. These values reflect the large decline in the percentage contribution by agriculture to total earnings and the decrease in importance of agriculture to the economy of WRPA 6. Manufacturing earnings are projected to increase from 12.3 percent of total earnings in 1968 to 16.9 percent in both 1980 and 2020.

All other industries are expected to continue accounting for larger proportions of total earnings, as reflected in the projected 74.8 percent in 2020, as compared with 52.1 percent in 1968. The greatest growth in this category is expected in government, services, and wholesale and retail trade.

Per worker earnings are projected to increase 3.2 percent annually after 1980 under Programs A and B. This compares with the 1959-1968 and 1968-1980 rates of 3.9 and 1.7 percent, respectively. As skilled and semiskilled employment increases as a proportion of total employment in WRPA 6, per worker earnings are projected to increase from 81.0 percent of the national average in 1968 to 88.0 percent in 2020.

## PROGRAM B, REGIONAL DEVELOPMENT

### Population

Program B projections indicate that the gradual decline in the area's population will continue through 2000, with an increase occurring thereafter (see table 66). Thus, Program B population projections contrast with those of Program A in that Program A projections indicate a rapid decline between 1970 and 1980, stability between 1980 and 2000, and an increase after 2000.

Decreases of 1.3 percent between 1968 and 1980 and 1.6 percent between 1980 and 2000 are expected. These decreases are slightly below the 2.1 percent which occurred during the 1959-1968 period. The increase which will occur during the 2000-2020 period will result in a 2020 population that is 9.6 percent above the 1968 population. By comparison, Program A projections show a 2020 estimate equal to that for 1968.

### Employment

As shown in table 66, total employment under Program B is projected to increase 6.1 percent between 1968 and 1980, 16.8 percent between 1980 and 2000, and 18.2 percent between 2000 and 2020. These values indicate a continuation of the increase in employment which began during the last decade following a substantial loss of employment during the 1950-1959 period. Program A projections, in comparison, indicate a reversal of the increasing trend of the 1960's and a decline of 3.3 percent between 1968 and 1980. Beyond 2000, however, the rates of increase in employment for Programs A and B are equal.

### Personal and Per Capita Income

Under Program B, total personal income for the area is expected to increase at a slower rate between 1968 and 1980 than it did during the preceding decade (see table 66). However, it is still expected to increase 39.5 percent by 1980, resulting in 9.8 percent more personal income in 1980 under Program B than under Program A. By 2020, personal income for Program B will be 17.9 percent greater than Program A personal income. The increase as projected by both programs is greater than 100 percent for the 1980-2000 and 2000-2020 periods.

Program B projections indicate that the 1968 per capita income of $1,960 will increase 41.4 percent by 1980 and 483.1 percent by 2020. Although the rate of increase is higher for Program B than for

Program A, except for the 2000-2020 period, the per capita income values under the two programs are similar.

### Total and Per Worker Earnings

As shown in table 63, Program B projections indicate a continuation of the upward trend in earnings in WRPA 6. The 1968 earnings of $291.3 million are projected to increase to $378.0 million in 1980, an increase of 29.8 percent. The annual growth rate of 2.2 percent during this period, however, is substantially below the 4.0 percent of the preceding period (1959-1968). After 1980, however, growth rates of 4.0 to 4.1 percent annually approximate that of the 1959-1968 period and are also equal to that of the Lower Mississippi Region.

Program B as well as Program A projections show per worker earnings increasing at an annual rate of 3.2 percent after 1980, which is below the 3.9 percent of the 1959-1968 period. Specific per worker earnings of $6,595, $12,479, and $23,349 are expected under Programs A and B for 1980, 2000, and 2020, respectively.

## OUTLOOK FOR THE FUTURE

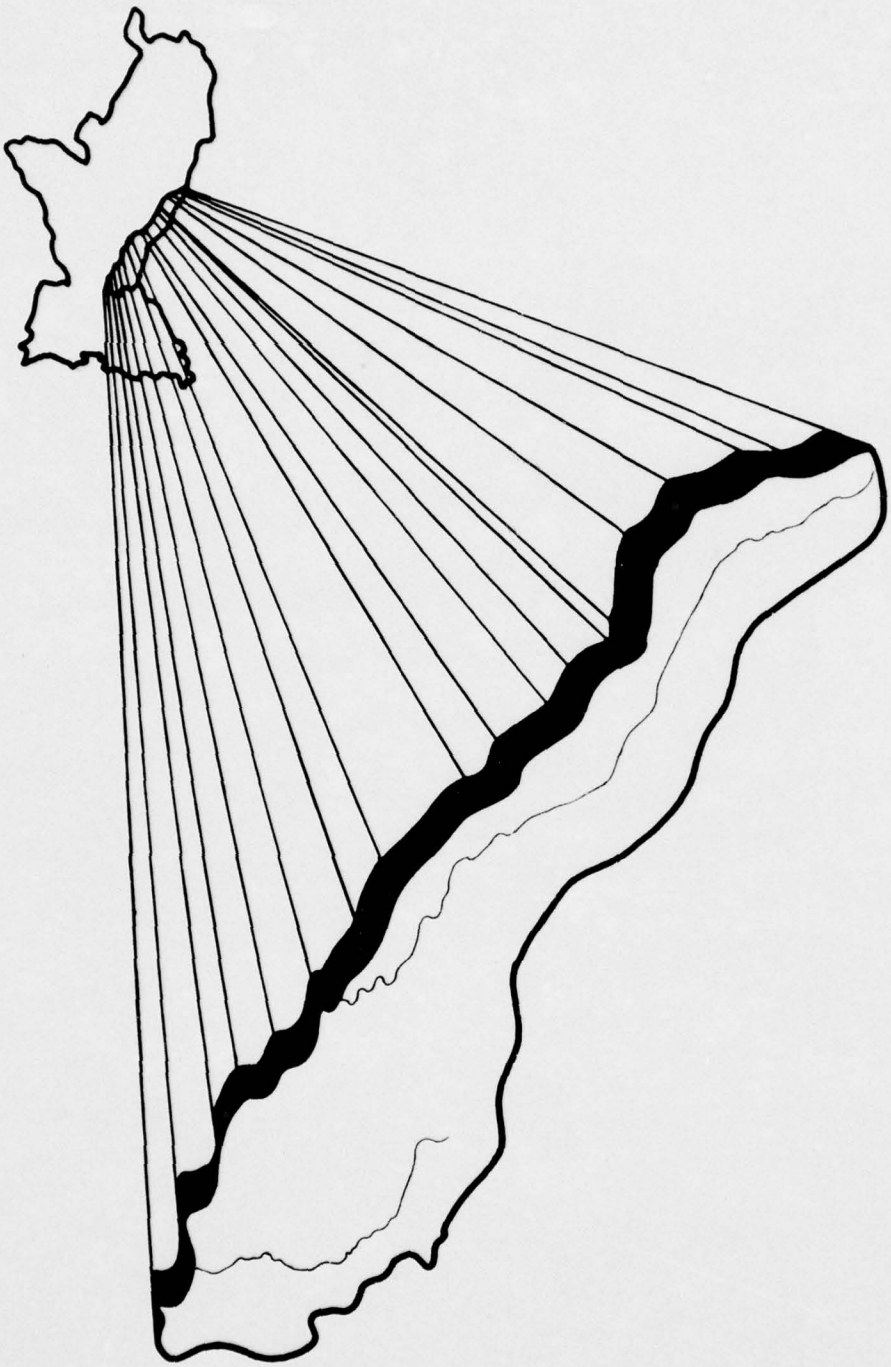
Population changes for the area are substantially different from the continuing increases expected for the Nation and Lower Mississippi Region. The present decline is expected to continue during the next decade, with a gradual increase occurring thereafter. The projected 2020 population is almost equal to the present population, reflecting the extent to which growth in the area will remain below that for other areas.

Between 1969 and 2020, personal income in WRPA 6 is projected to increase at a faster rate than population. As a result, per capita income in WRPA 6 will increase from 59 to 75 percent of the national average. Total personal income in the area, however, is expected to continue accounting for a smaller share of the Nation's total.

Earnings within WRPA 6 are projected to more than double by 2000. Under Program B, total earnings in the area will increase at a rate greater than that of the Nation or region during the latter part of the projection period. Most of the increase will occur in nonmajor water-using industries, particularly government, services, and wholesale and retail trade. Greater earnings in these industries, however, will not improve WRPA 6's relative position, since the percentage contribution to total national earnings by these industries is expected to decline.

Agriculture, historically the largest contributor to total earnings by a major water-using industry in WRPA 6, is projected to experience a large decline in earnings during the next decade. During this period, however, the gross value of agricultural production will increase to the extent that it will represent over two-thirds of gross production by major water-using industries in 1980. By 2020, however, gross production by manufacturing is projected to surpass that by agriculture.

While tremendous changes have occurred in agriculture in WRPA 6, similar changes have not occurred in nonagricultural industries to the extent that they have in other planning areas. The opportunity exists for the area to make advances above the historical pace. Based on OBERS projections, however, WRPA 6 will lag behind many areas in achieving the broad, basic, economic changes which are occurring and are projected to occur in the Lower Mississippi Region. Implementation of regional development programs should improve the situation but not to the degree that WRPA 6 can advance as rapidly as the Nation or Lower Mississippi Region.

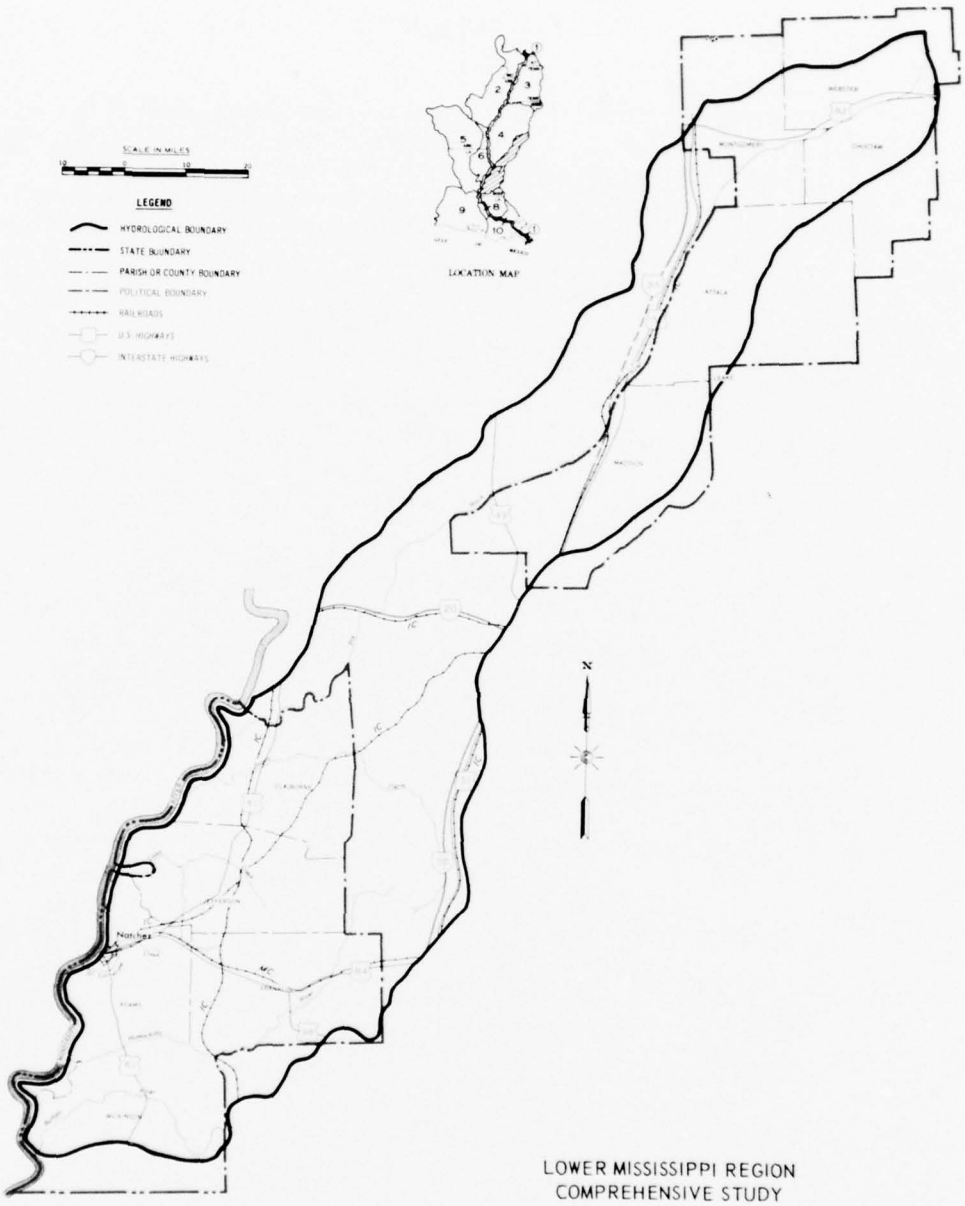


# WRPA 7

# WRPA 7, BIG BLACK

## PHYSICAL DESCRIPTION

WRPA 7 (figure 17) consists of two separate areas, the first of which comprises five counties in the middle of the State of Mississippi. Three of the five counties are grouped around the origin of the Big Black River, and the other two counties lie immediately to the southwest. The second part of WRPA 7 consists of five counties in southwest Mississippi. Four of these are bounded on the west by the Mississippi River. The Big Black River is the major stream in the upper part of WRPA 7, while the principal streams in the lower portion are the Buffalo and Homochitto Rivers and Bayou Pierre. Most of the drainage originates as rapid runoff along numerous short tributaries in the hill area. A smaller amount of drainage originates within the small strip of swampy flatland lying around the Mississippi River.




LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

**WATER RESOURCE PLANNING**
**AREA 7**

FIGURE 17

## ECONOMIC DESCRIPTION

### Natural Resources

This area comprises 5,461 square miles, or 3,495,040 acres. Agricultural lands comprise 3,296,909 acres; of this acreage, 58 percent is in farms and 42 percent is in forest and other uses. Nonagricultural land uses comprise 154,211 acres, 75 percent of which is urban and built-up and 25 percent of which is in small bodies of water. The remaining 43,920 acres are in large bodies of water.

The 1,900,000 acres used for farming are devoted to forest land, cropland, and pastureland. The principal crops are soybeans, hay, cotton, and corn.

Adams County accounts for about half of the mineral products for the area. Petroleum, natural gas, natural gas liquids, and sand and gravel production were valued at over $47 million in 1968 for WRPA 7.

Commercial forest lands within the area cover 2.3 million acres. The most common types of timber in the area are oak-hickory, which occupies 31 percent of the area, and loblolly-shortleaf pine, which occupies 29 percent.

The Mississippi River bottoms and the associated bottomland hardwoods together with the pine-mixed hardwood forests of the uplands provide some of the most productive wildlife habitats to be found in the Southeastern United States. Deer, wild turkeys, squirrels, and rabbits are the major game species hunted in the area. Most of the Homochitto National Forest, which is open to public recreational use, lies within the southwestern part of the area.

The streams, oxbow lakes, and farm ponds within the area offer excellent sport fishing. Largemouth bass, catfish, buffalo, and a large variety of panfish represent most of the fish taken.

The oxbow lakes and flooded hardwood forests attract migratory waterfowl during the fall and winter months. Wood ducks are year-round residents of the forest areas near permanent water.

### Industrial Development

In 1967, manufacturing employment for WRPA 7 was 12,800, approximately 84 percent of which was production workers. The total payroll for the 290 manufacturing firms in the area was $64.2 million.

Between 1967 and 1968, the value of gross production for

manufacturing increased from $124.3 million to $131.8 million, or 6 percent (see tables 67 and 68 and figure 18). The value added by manufacturing increased 40 percent.

Twenty-nine percent of the firms employed 20 or more persons, and 11 percent employed 100 or more. In 1968, other manufacturing accounted for the largest contribution to value of gross products from manufacturing, with 72.0 percent of the total (see tables 69 and 70). Included in the other manufacturing group are: lumber and furniture, miscellaneous manufacturing, apparel and other textiles, machinery, transportation, and printing and publishing, in order of contribution. Following the other manufacturing group in gross product originating were the paper and allied products industry with 20.3 percent, and the food and kindred products industry with 5.7 percent.

## Agricultural Development

Agriculture has traditionally played an important role in the economy of WRPA 7. For example, in 1959 agricultural earnings exceeded $24.5 million, which was more than 16 percent of total earnings in the area. By 1968, these earnings rose to $34.9 million. Another example of the importance of agriculture in WRPA 7 is reflected in the employment situation. Employment figures for agriculture in WRPA 7 include employment in forestry and fisheries. Over 43.8 percent of the area's employment was in agriculture in 1950. Although this decreased to 23.3 percent in 1960, agriculture still represents a major employment industry in the area.

Land in farms accounted for 54.4 percent of WRPA 7 in 1970. There were 8,228 farms in the area in 1970, as compared with 12,319 in 1959. During the ten years prior to 1970, the average farm size increased from 166 to 231 acres. Almost 53.0 percent of the farms were commercial in 1970, an increase over the 48.6 percent in 1959. Between 1949 and 1970, the number of farms decreased 60 percent, average size increased 109 percent, and land in farms decreased 18 percent. Over time, cropland has represented approximately one-fourth of total farmland, although the proportion has declined slightly.

Farm forest land declined from 1.2 million acres in 1949 to 912,000 acres in 1970. More than half of the total farm forest land is pastured. Some of the forest land is physically suited for crop production. Permanent pastureland increased from 296,000 acres in 1949 to 494,000 acres in 1970. Other farmland accounted for approximately 4 percent of total land in farms.

In 1970, the principal crops harvested in WRPA 7 were soybeans, hay, cotton, and corn. These crops accounted for 97 percent of total harvested crops. Two of these crops, cotton and corn, experienced

Table 67 - Earnings by Major Industries in WRPA 7

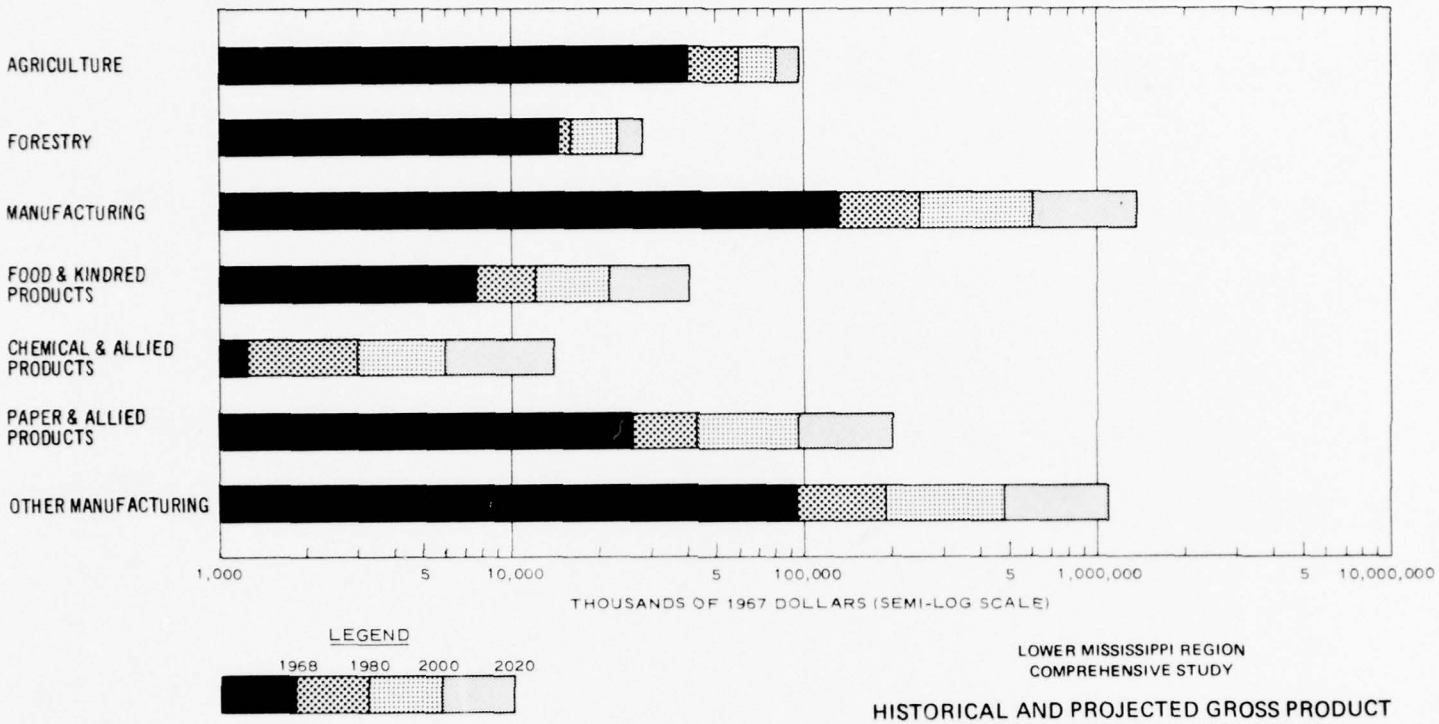
| Industry | Earnings in Indicated Years, thousands of 1967 dollars | | | | | |
|---|---|---|---|---|---|---|
| | 1950 | 1959 | 1968 | 1980 | 2000 | 2020 |
| Total, Program A | 129,775 | 152,421 | 245,660 | 368,000 | 798,000 | 1,756,000 |
| Total, Program B | -- | -- | -- | 403,000 | 923,000 | 2,071,000 |
| Per Worker 1/ | | | | | | |
| Program A | 2,142 | 3,026 | 4,239 | 6,095 | 11,396 | 20,866 |
| Program B | -- | -- | -- | 6,095 | 11,396 | 20,866 |
| Agriculture | | | | | | |
| Program A | 33,993 | 24,523 | 34,852 | 25,000 2/ | 33,000 2/ | 61,000 2/ |
| Program B | -- | -- | -- | 27,000 2/ | 39,000 2/ | 72,000 2/ |
| Forestry & Fisheries | | | | | | |
| Program A | 398 | 455 | 437 | -- | -- | -- |
| Program B | -- | -- | -- | -- | -- | -- |
| Mining | | | | | | |
| Program A | 2,403 | 6,233 | 7,837 | 11,000 | 16,000 | 23,000 |
| Program B | -- | -- | -- | 12,000 | 19,000 | 27,000 |
| Manufacturing | | | | | | |
| Program A | 32,615 | 42,897 | 81,332 | 133,000 | 293,000 | 637,000 |
| Program B | -- | -- | -- | 146,000 | 339,000 | 751,000 |
| Food & Kindred Products | | | | | | |
| Program A | 2,955 | 3,415 | 4,255 | 6,000 | 10,000 | 18,000 |
| Program B | -- | -- | -- | 6,000 | 12,000 | 22,000 |
| Textile Mill Products | | | | | | |
| Program A | 1,651 | 375 | 724 | W 3/ | W | W |
| Program B | -- | -- | -- | W | W | W |
| Chemical & Allied Products | | | | | | |
| Program A | 0 | 336 | 550 | 1,000 | 2,000 | 4,000 |
| Program B | -- | -- | -- | 1,000 | 2,000 | 5,000 |
| Paper & Allied Products | | | | | | |
| Program A | 9,841 | 12,801 | 15,366 | 23,000 | 47,000 | 99,000 |
| Program B | -- | -- | -- | 25,000 | 55,000 | 117,000 |
| Petroleum Refining | | | | | | |
| Program A | W | W | W | W | W | W |
| Program B | -- | -- | -- | W | W | W |
| Primary Metals | | | | | | |
| Program A | W | W | W | W | W | W |
| Program B | -- | -- | -- | W | W | W |
| Other Manufacturing | | | | | | |
| Program A | 18,168 | 25,970 | 60,437 | 103,000 | 234,000 | 516,000 |
| Program B | -- | -- | -- | 114,000 | 270,000 | 607,000 |
| All Other | | | | | | |
| Program A | 60,366 | 78,313 | 121,202 | 199,000 | 456,000 | 1,035,000 |
| Program B | -- | -- | -- | 218,000 | 526,000 | 1,221,000 |

1/ Per worker earnings are given in 1967 dollars.
2/ Includes forestry & fisheries data.
3/ W—Withheld to avoid disclosing company confidential information.

Table 68 - Employment by Major Industries in WRPA 7

| Industry | Number of Persons Employed in Indicated Years | | | | |
|---|---|---|---|---|---|
| | 1950 | 1960 | 1980 | 2000 | 2020 |
| Total, Program A | 60,589 | 50,378 | 60,000 | 70,000 | 84,000 |
| Total, Program B | -- | -- | 66,000 | 81,000 | 99,000 |
| Agriculture | | | | | |
| Program A | 26,568 1/ | 11,758 1/ | 3,900 1/ | 2,700 1/ | 2,600 1/ |
| Program B | -- | -- | 3,900 1/ | 2,900 1/ | 2,800 1/ |
| Forestry & Fisheries | | | | | |
| Program A | -- | -- | -- | -- | -- |
| Program B | -- | -- | -- | -- | -- |
| Mining | | | | | |
| Program A | 734 | 639 | 720 | 740 | 730 |
| Program B | -- | -- | 790 | 850 | 860 |
| Manufacturing | | | | | |
| Program A | 10,453 | 11,092 | 18,000 | 22,000 | 27,000 |
| Program B | -- | -- | 19,000 | 25,000 | 32,000 |
| Food & Kindred Products | | | | | |
| Program A | 523 | 842 | 870 | 870 | 880 |
| Program B | -- | -- | 950 | 1,000 | 1,000 |
| Textile Mill Products | | | | | |
| Program A | 689 | 281 | W 2/ | W | W |
| Program B | -- | -- | W | W | W |
| Chemical & Allied Products | | | | | |
| Program A | 81 | 152 | 95 | 120 | 150 |
| Program B | -- | -- | 100 | 140 | 180 |
| Paper & Allied Products | | | | | |
| Program A | 1,146 | 1,715 | 3,100 | 3,600 | 4,400 |
| Program B | -- | -- | 3,400 | 4,200 | 5,200 |
| Petroleum Refining | | | | | |
| Program A | 31 | 131 | W | W | W |
| Program B | -- | -- | W | W | W |
| Primary Metals | | | | | |
| Program A | 10 | 30 | W | W | W |
| Program B | -- | -- | W | W | W |
| Other Manufacturing | | | | | |
| Program A | 7,973 | 7,941 | 14,000 | 17,000 | 22,000 |
| Program B | -- | -- | 15,000 | 20,000 | 26,000 |
| All Other | | | | | |
| Program A | 22,834 | 26,889 | 39,000 | 45,000 | 54,000 |
| Program B | -- | -- | 42,000 | 52,000 | 63,000 |

1/ Includes forestry & fisheries data.
2/ W—Withheld to avoid disclosing company confidential information.




LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

HISTORICAL AND PROJECTED GROSS PRODUCT
ORIGINATING BY MAJOR INDUSTRIES

WRPA 7 PROGRAM B

FIGURE 18

Table 69 - Gross Product Originating by Major Industries in WRPA 7

| Industry | Gross Product Originating in Indicated Year thousands of 1967 dollars | | | | |
|---|---|---|---|---|---|
| | 1967 | 1968 | 1980 | 2000 | 2020 |
| Agriculture 1/ | | | | | |
| Program A | -- | 40,755 2/ | 60,000 | 74,000 | 90,000 |
| Program B | -- | -- | 60,000 | 80,000 | 98,000 |
| Forestry 3/ | | | | | |
| Program A | -- | 14,500 2/ | 12,000 | 18,000 | 21,000 |
| Program B | -- | -- | 16,000 | 23,000 | 28,000 |
| Mining, Petroleum | | | | | |
| Program A | W 4/ | W | -- | -- | -- |
| Program B | W | W | -- | -- | -- |
| Quarrying | | | | | |
| Program A | W | W | -- | -- | -- |
| Program B | W | W | -- | -- | -- |
| Manufacturing | | | | | |
| Program A | 124,332 | 131,792 | 226,000 | 521,000 | 1,155,000 |
| Program B | -- | -- | 248,000 | 603,000 | 1,362,000 |
| Food & Kindred Products | | | | | |
| Program A | 7,015 | 7,576 | 11,000 | 19,000 | 34,000 |
| Program B | -- | -- | 12,000 | 22,000 | 41,000 |
| Textile Mill Products | | | | | |
| Program A | 970 | 999 | W | W | W |
| Program B | -- | -- | W | W | W |
| Chemical & Allied Products | | | | | |
| Program A | 1,274 | 1,261 | 2,000 | 5,000 | 12,000 |
| Program B | -- | -- | 5,000 | 6,000 | 14,000 |
| Paper & Allied Products | | | | | |
| Program A | 25,740 | 26,770 | 39,000 | 82,000 | 173,000 |
| Program B | -- | -- | 43,000 | 95,000 | 204,000 |
| Petroleum Refining | | | | | |
| Program A | W | W | W | W | W |
| Program B | -- | -- | W | W | W |
| Primary Metals | | | | | |
| Program A | -- | W | W | W | W |
| Program B | -- | -- | W | W | W |
| Other Manufacturing | | | | | |
| Program A | 89,333 | 95,186 | 174,000 | 415,000 | 936,000 |
| Program B | -- | -- | 190,000 | 480,000 | 1,103,000 |

1/ Marketing receipts.
2/ 1970 data.
3/ Value at local point of delivery including stumpage, cutting, and hauling.
4/ W—Withheld to avoid disclosing company confidential information.

Table 70 - Index of Output by Major Industries, WRPA 7
Big Black (1967 = 100)

| Industry | 1967 | 1968 | 1980 | 2000 | 2020 |
|---|---|---|---|---|---|
| Agriculture | | | | | |
| Program A | -- | 100 1/ | 147 | 182 | 221 |
| Program B | -- | -- | 147 | 196 | 237 |
| Forestry | | | | | |
| Program A | -- | 100 1/ | 84 | 126 | 143 |
| Program B | -- | -- | 110 | 158 | 190 |
| Mining, Petroleum | | | | | |
| Program A | 100 | 104 | 152 | 200 | 341 |
| Program B | -- | -- | 167 | 231 | 402 |
| Quarrying | | | | | |
| Program A | 100 | 97 | 177 | 343 | 676 |
| Program B | -- | -- | 194 | 397 | 797 |
| Manufacturing | | | | | |
| Program A | 100 | 106 | 182 | 419 | 929 |
| Program B | 100 | 106 | 200 | 485 | 1,096 |
| Food & Kindred Products | | | | | |
| Program A | 100 | 108 | 151 | 275 | 491 |
| Program B | 100 | 108 | 166 | 318 | 579 |
| Textile Mill Products | | | | | |
| Program A | 100 | 103 | -- | -- | -- |
| Program B | 100 | 103 | -- | -- | -- |
| Chemical & Allied Products | | | | | |
| Program A | 100 | 99 | 182 | 424 | 965 |
| Program B | 100 | 99 | 200 | 490 | 1,138 |
| Paper & Allied Products | | | | | |
| Program A | 100 | 104 | 153 | 320 | 672 |
| Program B | 100 | 104 | 168 | 370 | 793 |
| Petroleum Refining | | | | | |
| Program A | 100 | 145 | 195 | 463 | 1,047 |
| Program B | 100 | 145 | 214 | 536 | 1,235 |
| Primary Metals | | | | | |
| Program A | -- | -- | -- | -- | -- |
| Program B | -- | -- | -- | -- | -- |
| Other Manufacturing | | | | | |
| Program A | 100 | 107 | 195 | 463 | 1,047 |
| Program B | 100 | 107 | 214 | 536 | 1,235 |

1/ 1970 used as base.



Beef cattle in WRPA 7



Camping in WRPA 7



Furniture company in WRPA 7



Armstrong Rubber Company plant, Natchez, Miss.

decreases in acreage harvested between 1959 and 1970. Corn acreage, which accounted for 40.9 percent of acres harvested in 1959, declined 66.8 percent. The most significant increase in acreage was the 788.1 percent increase in soybean acreage.

Currently, livestock and poultry enterprises are almost equally as important as crop enterprises. Livestock, dairy, and poultry farms represented 1,309 farms, or 16 percent of the total farms in 1970. During the period 1949-1970, there was an upward trend in the sale of cattle and calves, chickens, and eggs.

In 1970, gross farm income was approximately $47.4 million, realized net farm income approximately $14.2 million, and net income per farm $1,728. As shown in table 71, the gross value of crop production in WRPA 7 was $23.0 million in 1970. This represents 56.4 percent of total farm marketing receipts of $40.8 million. Livestock and livestock product sales accounted for the remainder, or 43.6 percent. This contrasts to the 1959 situation in which livestock and livestock product sales dominated total farm marketings with 56.9 percent of the total. Based on the values above, the average value of farm products sold per farm in 1970 was $4,959. Table 71 values also indicate a decline in the production of all crops except soybeans, cotton, and hay. Between 1959 and 1970, the most significant changes in production were the enormous increase of 1,989 percent in soybeans and the 54.0 percent decrease in corn production. Although the value of livestock and livestock product sales increased sharply prior to 1959, the 1959 and 1970 sales were similar, both being between 17 and 18 million dollars.

Table 71 - Agricultural Production (Crops and Livestock) in WRPA 7

| Commodity | Unit of Measurement | Data for Indicated Years 1959 | 1970 | 1980 | 2000 | 2020 |
|---|---|---|---|---|---|---|
| Cotton | Bales | | | | | |
| Program A 1/ | | 56,503 | 64,800 | 89,000 | 97,000 | 104,000 |
| Program B 1/ | | -- | -- | 89,000 | 104,000 | 112,000 |
| Corn | Bushels | | | | | |
| Program A | | 3,122,329 | 1,435,000 | 981,000 | 1,356,000 | 1,622,000 |
| Program B | | -- | -- | 981,000 | 1,456,000 | 1,742,000 |
| Sorghum | Bushels | | | | | |
| Program A | | 83,609 | 26,500 | 92,000 | 118,000 | 164,000 |
| Program B | | -- | -- | 92,000 | 127,000 | 176,000 |
| Oats | Bushels | | | | | |
| Program A | | 279,756 | 144,000 | 130,000 | 134,000 | 139,000 |
| Program B | | -- | -- | 130,000 | 144,000 | 149,000 |
| Rice | Bushels | | | | | |
| Program A | | 0 | 0 | 0 | 0 | 0 |
| Program B | | -- | -- | 0 | 0 | 0 |
| Irish Potatoes | Bushels | | | | | |
| Program A | | 20,551 | 10,000 | 8,000 | 10,000 | 13,000 |
| Program B | | -- | -- | 8,000 | 11,000 | 14,000 |
| Sweet Potatoes | Bushels | | | | | |
| Program A | | 172,946 | 116,250 | 87,000 | 90,000 | 113,000 |
| Program B | | -- | -- | 87,000 | 97,000 | 121,000 |
| Tobacco | Pounds | | | | | |
| Program A | | 0 | 0 | 0 | 0 | 0 |
| Program B | | -- | -- | 0 | 0 | 0 |
| Sugarcane | Tons | | | | | |
| Program A | | 0 | 0 | 0 | 0 | 0 |
| Program B | | -- | -- | 0 | 0 | 0 |
| Wheat | Bushels | | | | | |
| Program A | | 10,150 | 7,000 | 21,000 | 25,000 | 28,000 |
| Program B | | -- | -- | 21,000 | 27,000 | 30,000 |
| Soybeans | Bushels | | | | | |
| Program A | | 88,893 | 1,856,875 | 3,595,000 | 4,430,000 | 5,194,000 |
| Program B | | -- | -- | 3,595,000 | 4,759,000 | 5,577,000 |

1/ Program A data incorporates 1970 production estimates; Program B data reflect the projected national growth rate shown in Table II-18, Selected National Aggregates, Volume 1, Economic Activity in the United States by Water Resources Regions and Subareas, Historical and Projected, 1929-2020, pages II-18 through II-22.

Table 71 - Agricultural Production (Crops and Livestock) in WRPA 7 (Con.)

| Commodity | Unit of Measurement | Data for Indicated Years 1959 | 1970 | 1980 | 2000 | 2020 |
|---|---|---|---|---|---|---|
| Forest Products 2/ | Thousands of Cubic Feet | | | | | |
| Program A | | -- | 77,100 | 65,000 | 97,000 | 110,000 |
| Program B | | -- | -- | 85,000 | 122,000 | 147,000 |
| Hay | Tons | | | | | |
| Program A | | 65,155 | 82,326 | 106,000 | 131,000 | 161,000 |
| Program B | | -- | -- | 106,000 | 140,000 | 173,000 |
| Gross Value of Crops | Thousands of 1967 Dollars | | | | | |
| Program A | | 13,000 | 23,000 | 32,000 | 37,000 | 42,000 |
| Program B | | -- | -- | 32,000 | 40,000 | 46,000 |
| | | Livestock Thousands 3/ | | | | |
| Beef | Pounds | | | | | |
| Program A | | -- | 68,100 | 86,757 | 116,780 | 156,833 |
| Program B | | -- | -- | 86,757 | 125,450 | 168,420 |
| Pork | Pounds | | | | | |
| Program A | | -- | 12,305 | 14,011 | 18,301 | 23,756 |
| Program B | | -- | -- | 14,011 | 19,660 | 25,511 |
| Lamb | Pounds | | | | | |
| Program A | | -- | 52 | 40 | 47 | 58 |
| Program B | | -- | -- | 40 | 50 | 62 |
| Chickens | Pounds | | | | | |
| Program A | | -- | 1,268 | 1,759 | 2,456 | 3,298 |
| Program B | | -- | -- | 1,759 | 2,638 | 3,542 |
| Turkeys | Pounds | | | | | |
| Program A | | -- | 28 | 37 | 52 | 70 |
| Program B | | -- | -- | 37 | 56 | 75 |
| Eggs | Dozen | | | | | |
| Program A | | -- | 8,152 | 8,944 | 11,450 | 14,503 |
| Program B | | -- | -- | 8,944 | 12,300 | 15,575 |
| Milk | Pounds | | | | | |
| Program A | | -- | 49,707 | 45,627 | 56,316 | 68,777 |
| Program B | | -- | -- | 45,627 | 60,497 | 73,858 |
| Gross Value of Livestock | 1967 Dollars | | | | | |
| Program A | | 17,133 | 17,851 | 27,647 | 36,618 | 48,319 |
| Program B | | -- | -- | 27,647 | 39,336 | 51,888 |

2/ Includes sawlogs, veneer logs, pulpwood, poles, etc., cut for industrial or consumer uses. (U. S. Forest Service.)
3/ Net liveweight production.

## HISTORICAL TRENDS

### Population

As shown in table 72, the population of WRPA 7 declined continuously from 177,900 in 1950 to 156,000 in 1970. Approximately 71.0 percent of this 1970 population was rural. A decrease of 7.4 percent occurred during the period of greatest decline, 1950 to 1959, as the population dropped to 164,700. The downward trend continued through 1970, resulting in a 5.3 percent decrease between 1959 and 1970.

Table 72 - Economic Profile Summary for WRPA 7

| Parameter | Data for Indicated Years | | | | | |
|---|---|---|---|---|---|---|
| | 1950 | 1959 | 1968 | 1980 | 2000 | 2020 |
| Population (1 July) 1/ | | | | | | |
| Program A | 177,910 | 164,709 | 160,580 | 162,000 | 183,000 | 217,000 |
| Program B | -- | -- | -- | 179,000 | 213,000 | 254,000 |
| Personal Income 2/ | | | | | | |
| Program A | 158,230 | 183,278 | 304,486 | 477,000 | 1,045,000 | 2,305,000 |
| Program B | -- | -- | -- | 523,000 | 1,208,000 | 2,718,000 |
| Per Capita 2/ | | | | | | |
| Program A | 889 | 1,113 | 1,896 | 2,947 | 5,705 | 10,599 |
| Program B | -- | -- | -- | 2,947 | 5,705 | 10,683 |
| Earnings 2/ | | | | | | |
| Total, Program A | 129,775 | 152,421 | 245,660 | 368,000 | 798,000 | 1,756,000 |
| Total, Program B | -- | -- | -- | 403,000 | 923,000 | 2,071,000 |
| Per Worker 2/ | | | | | | |
| Program A | 2,142 | 3,026 | 4,239 | 6,095 | 11,396 | 20,866 |
| Program B | -- | -- | -- | 6,095 | 11,396 | 20,866 |
| Employment | | | | | | |
| Total, Program A | 60,589 | 50,378 | 57,950 | 60,000 | 70,000 | 84,000 |
| Total, Program B | -- | -- | -- | 66,000 | 81,000 | 99,000 |
| Gross Manufacturing Product 2/ | | | | | | |
| Total, Program A | -- | -- | 131,792 | 226,000 | 521,000 | 1,155,000 |
| Total, Program B | -- | -- | -- | 248,000 | 603,000 | 1,362,000 |
| Gross Farm Marketing Receipts 2/ | | | | | | |
| Total, Program A | -- | -- | 40,755 3/ | 60,000 | 74,000 | 90,000 |
| Total, Program B | -- | -- | -- | 60,000 | 80,000 | 98,000 |

1/ U. S. Bureau of Census figures show the 1970 population of WRPA 7 as 156,496.
2/ Personal income, total earnings, gross manufacturing product, and gross farm marketing receipt data are given in thousands of 1967 dollars; per capita income and per worker earnings are given in 1967 dollars.
3/ 1970 data.

Therefore, the rate of decrease has been declining, with the 1959-1970 rate being about 0.3 percent annually.

During the 1950-1959 period, agriculture's share of total employment decreased from 43.8 percent at the beginning of the period to 23.3 percent in 1960. Part of this decrease resulted from the implementation of a greater degree of mechanization, and part of it resulted from the termination of many family-type farm operations. Fewer labor-intensive methods were also applied in other industries. Many of the displaced workers were forced to other regions for employment, thus accounting for much of the area's loss in population. This trend was blunted somewhat during the 1959-1968 period by increased employment opportunities in other industries, manufacturing in particular.

## Employment

As in many other areas in this region, employment in WRPA 7 declined during the period 1950-1959 but increased between 1959 and 1968. There were 60,600 persons employed in the area in 1950, as compared with 50,400 in 1959 and 58,000 in 1968 (see table 72). These values indicate an increase of 15.1 percent in employment between 1959 and 1968, but a 16.8 percent decrease during the previous period (1950-1959).

The two major water-using industries in WRPA 7, agriculture and manufacturing, accounted for 23.3 and 22.0 percent, respectively, of the area's total employment in 1960. The greatest change in employment occurred in agriculture, as indicated by an absolute decrease of 14,810 workers during the 1950-1960 period, a 55.7 percent decrease. Manufacturing employment increased 5.7 percent between 1950 and 1960 (from 10,500 to 11,100). The paper and allied products industry and the food and kindred products industry contributed most to manufacturing employment.

Employment in all other industries represented 53.4 percent of total employment in 1960. The increase of 4,055 employees in this category between 1950 and 1960 offset 27.4 percent of the losses incurred in agricultural employment.

The importance of agriculture in the economy of WRPA 7 in 1950 is illustrated by the fact that agriculture accounted for almost 44 percent of total employment. The mechanization of this stalwart industry and the termination of many smaller agricultural operations resulted in much of the area's loss in employment during the 1950's. During the 1960's, however, the decline in agricultural employment lessened, and employment in other industries increased at an accelerated rate. This resulted in a reversal of the downward trend in employment of the 1950's to an upward trend during the 1960's.

## Personal and Per Capita Income

Table 72 values indicate that personal income in WRPA 7 increased from $158.2 million in 1950 to $304.5 million in 1968, or 92.5 percent. Almost 83 percent of this increase occurred between 1959 and 1968, a period in which the annual growth rate was 5.8 percent. During the prior period (1950-1959), the annual growth rate was substantially lower at 1.6 percent. The slower increase of the earlier period reflects the negative effects of a substantial decrease in agricultural earnings. An increase in employment of 15.0 percent and the employment of more skilled and semiskilled laborers contributed to the increase in total personal income between 1959 and 1968.

In 1968, per capita income in WRPA 7 was $1,896, or 57.0 percent of the national average. It increased 70.4 percent between 1959 and 1968, almost totally as a result of actual increases in total personal income as employment increased and more jobs requiring skilled laborers became available. These values indicate that WRPA 7 is still in a poor position when compared with the Nation. However, they also indicate substantial improvement over the dismal situation of the 1950's. For example, in 1950 the per capita income of WRPA 7 was only 43.0 percent of the national average. It increased 25.2 percent between 1950 and 1959, but over a third of this was due to population losses. Overall, the per capita income of the area has advanced steadily from a position far below the national average, although it still remains below that of many other areas in the immediate region.

## Total and Per Worker Earnings

Total earnings in WRPA 7 increased continuously from $129.8 million in 1950 to $245.7 million in 1968, or 89.3 percent (see table 67). Over three-fourths of this increase occurred during the 1959-1968 period, more than in many other areas. The annual growth rate (1.8 percent) was below that of the Nation (3.6 percent) during the 1950-1959 period but was above the national rate from 1959 to 1968 (5.4 percent as compared with 4.5 percent nationally). Agriculture and manufacturing, the two major contributors to earnings by specific major water-using industries, accounted for 14.2 and 33.1 percent, respectively, of the total earnings in WRPA 7 in 1968. This compares with 26.2 and 25.1 percent for agriculture and manufacturing, respectively, in 1950. The most irregular trend in earnings has occurred in agriculture, as indicated by a 27.9 percent decrease between 1950 and 1959 as opposed to a 42.1 percent increase during the following period. Manufacturing earnings, in comparison, have increased at an accelerated rate, as indicated by a 31.5 percent increase between 1950 and 1959 followed by an 89.6 percent increase between 1959 and 1968.

All other industries, accounting for 49.3 percent of total

earnings in WRPA 7 in 1968, contribute less to total earnings in this area than in WRPA's 4, 5, and 6. Major percentage contributions by industries in this category are as follows: (a) government, 15.3 percent; (b) wholesale and retail trade, 13.7 percent; and (c) services, 10.7 percent. In comparison, these same three industries accounted for 13.6, 16.3, and 11.4 percent, respectively, of total earnings in 1959. It is projected that by 1980, all other industries will increase their share of total earnings to 54.1 percent.

Per worker earnings were $4,239 in 1968, as compared with $3,026 in 1959, reflecting a 40.1 percent increase during the period (see table 72). The annual rate of increase was relatively steady at 3.8 to 3.9 percent during the 1950-1968 period. Increases in higher wage industry employment as a proportion of total employment have been accompanied by increases in per worker earnings from 48.0 percent of the national average in 1950 to 56.0 percent in 1959. Although per worker earnings have risen in the area, they still remain below those for most areas in the region.

## ECONOMIC PROBLEMS

As of July 1971, nine of the ten counties in WRPA 7 were designated as eligible for assistance under the Public Works and Economic Development Act of 1965. Qualification of these counties, based on high unemployment and/or low median family income, permits them to obtain Federal aid in efforts to stimulate economic growth.

### Low Income Levels

WRPA 7, like many other areas in the Lower Mississippi Region, has historically had a low per capita income as related to the national average. In 1968, for example, the average per capita income for the area was $1,896, or 57.0 percent of the national average. Low-income, labor-intensive industries have been dominant in the area. More jobs requiring skilled and semiskilled laborers are needed to increase per worker earnings and to raise the per capita income.

### Unemployment and Underemployment

Unemployment in the area has been relatively high at approximately 6 percent. In addition, underemployment has been high, which is indicative of the low per capita income. Though the area is faced with both substantial unemployment and underemployment, the situation should improve as more capital-intensive, higher paying industries move into and expand within the area.

### Population Loss

WRPA 7 has incurred substantial population losses during the past, particularly during the 1950-1959 period. Since a large part of the land is in farms, it is probable that displaced farm labor constituted much of the population loss. The downward trend is anticipated to level off during the next few years and move upward thereafter.

## PROGRAM A, NATIONAL INCOME

### Population

Program A projections in table 72 indicate that the downward trend in the population of WRPA 7 will be reversed during the 1968-1980 period, reflecting a projected increase of 1.0 percent. This is to be followed by estimated increases of 0.6 and 0.9 percent annually during the 1980-2000 and 2000-2020 periods, respectively. These rates fall below the 1.0 to 1.4 percent for the Nation and region between 1980 and 2020. Based on the growth described above, the population of WRPA 7 is expected to increase from 160,600 in 1968 to 162,000 in 1980 and 217,000 in 2020.

### Employment

As shown in table 72, total employment in WRPA 7 is projected to increase 0.3 percent annually between 1968 and 1980. Although this is substantially below the 1.6 percent rate of increase that occurred annually between 1959 and 1968, it does indicate a continuation of the upward trend in the area's employment. After 1980, the growth will increase at an accelerated rate, as indicated by projected increases of 0.8 and 0.9 percent annually during the 1980-2000 and 2000-2020 periods, respectively (table 68). Thus, under Program A projections, the 1968 employment of 58,000 will increase to 60,000 in 1980 and 84,000 in 2020.

### Personal and Per Capita Income

Program A projects that the 1968 total personal income of $304.5 million will increase to $477.0 million in 1980, an increase of 56.7 percent (see table 72). This represents an annual growth rate of 3.8 percent, as compared with a rate of 4.5 percent for the Nation and 3.8 percent for the Lower Mississippi Region. It is also below the 1959-1968 rate. A higher rate of 4.0 percent annually is predicted for the 1980-2000 period, but the growth will still remain slightly below that of the Nation and Lower Mississippi Region. Based on the rates described above, the personal income for WRPA 7 will increase 56.7, 119.1, and 120.6 percent during the 1968-1980, 1980-2000, and 2000-2020 periods, respectively.

The per capita income of the area has moved steadily toward the national average. Projections show a continuation of this trend to the extent that per capita income in WRPA 7 should increase to 62.0, 69.0, and 74.0 percent of the national average in 1980, 2000, and 2020, respectively. Historically, population losses have accounted for part of

the increase in the area's per capita income. Future increases are projected to result completely from personal income increases. Under Program A, the annual growth rate of 3.7 percent between 1968 and 1980 is substantially below the 6.1 percent rate of the preceding period (1959-1968) but slightly above those of the following periods. Based on the rates described above, the per capita income in WRPA 7 is expected to increase from $1,896 in 1968 to $2,947 in 1980 and $10,599 in 2020.

## Total and Per Worker Earnings

It is projected that under Program A, total earnings will increase from $245.7 million in 1968 to $368 million in 1980, or 3.4 percent annually (table 72). This is a rate of growth substantially below the 5.4 percent of the previous period (1959-1968). After 1980, however, earnings will begin to increase at an accelerating rate, as evidenced by projected increases of 3.9 and 4.0 percent annually during the 1980-2000 and 2000-2020 periods, respectively.

Projections indicate that the per worker earnings in WRPA 7 will increase from $4,239 in 1968 to $6,095 in 1980. This represents an annual growth rate of 3.1 percent, which is moderately below the 3.8 percent of the previous period (1959-1968). After 1980, Program A projections indicate that the rate will remain relatively stable at 3.1 to 3.2 percent annually.

## PROGRAM B, REGIONAL DEVELOPMENT

### Population

Projections in table 72 indicate a population increase of 14.7 percent in WRPA 7 between 1970 and 1980 under Program B. For the same period, Program A estimates an increase in population of 3.8 percent. Due to the differences in growth between the two programs, the projected population for 1980 under Program B is 10.5 percent higher than that under Program A.

Program B projections reflect a population increase of 19.0 percent between 2000 and 2020. Thus, a fairly even rate of population increase is expected under Program B during the 1968-2020 period, whereas growth under Program A is expected to increase at increasing rates through 2000 and thereafter to equal the rates for Program B.

### Employment

Total employment in the area is projected to increase 13.9 percent between 1968 and 1980 under Program B (see table 72), as compared with the 15.0 percent increase which occurred during the 1959-1968 period. It is also substantially above the 3.5 percent increase which is projected under Program A for the period 1968-1980. Though the rate of increase is below that of the last decade, a fairly constant increase in employment is expected through 2020 (table 68).

### Personal and Per Capita Income

Total personal income in WRPA 7 is projected to increase 71.8 percent between 1968 and 1980, which indicates a growth rate of 4.6 percent (compared with 5.8 percent for the period 1959-1968). This growth is such that Program B personal income for 1980 is 9.6 percent above Program A estimates. Growth after 1980 will be slightly below that of the 1968-1980 period.

Based on values in table 72, the 1968 per capita income is projected to increase 55.4 percent between 1968 and 1980 and 463.4 percent by 2020. Both programs project growth rates of 3.7, 3.4, and 3.1 percent annually for the periods 1968-1980, 1980-2000, and 2000-2020, respectively. These are well below the 6.1 percent annual growth rate that occurred during the 1959-1968 period.

## Total and Per Worker Earnings

Total earnings under Program B are projected to increase from $245.7 million in 1968 to $403.0 million in 1980 and $2,071.0 million in 2020 (shown in table 72). This indicates a steady increase in total earnings of approximately 4.2 percent annually, although it is below the annual growth rate of 5.4 percent during the 1959-1968 period.

Program B, as well as Program A, projects per worker earnings to increase at an annual rate of 3.1 to 3.2 percent after 1968, as compared with a growth rate of 3.8 percent annually during the previous period. Per worker earnings of $6,095, $11,396, and $20,866 are expected under Programs A and B for 1980, 2000, and 2020, respectively.

## OUTLOOK FOR THE FUTURE

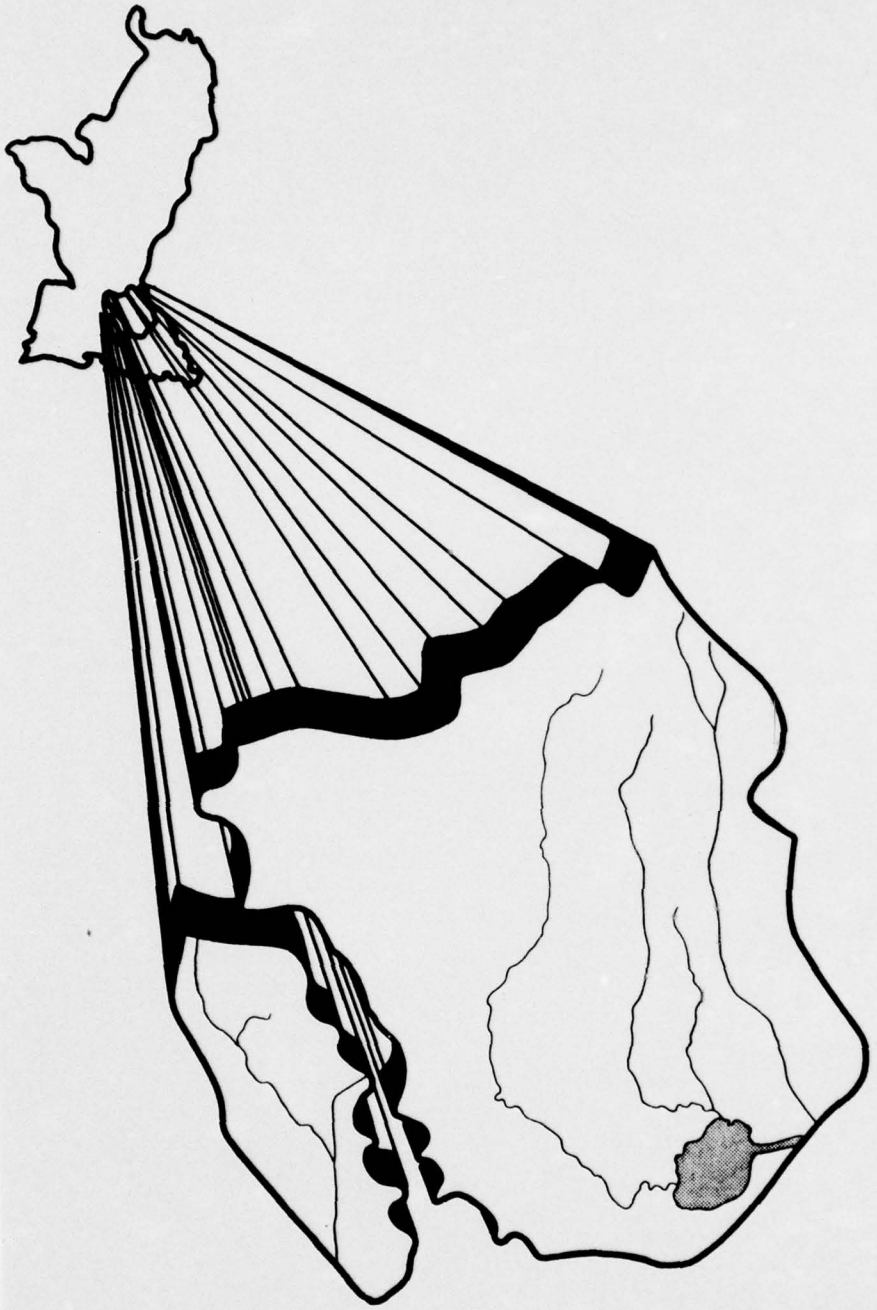
The declining population trend in WRPA 7 is expected to end between 1968 and 1980. Projections indicate that population will grow throughout the 1969-2020 projection period but at rates much lower than those of the Nation or Lower Mississippi Region.

Personal income is expected to increase at rates slower than those for the Nation or region but faster than the area's population growth. Consequently, per capita income increases are expected at rates higher than national or regional rate increases.

Total earnings are expected to increase approximately six times during the projection period. Manufacturing earnings are expected to grow at rates almost equal to those of the Nation and region and are projected to be the major contributor to total earnings. Other industries projected to account for major contributions to total earnings are, in order of expected contributions, government, wholesale and retail trade, services, and agriculture. Rapid growth is expected in all industries other than agriculture. In agriculture, a decline during the 1968-1980 period followed by slow growth between 1980 and 2020 is projected.

Employment is projected to increase at an increasing rate between 1968 and 2020. Although increasing, these rates will be much lower than projected national or regional rates.

In summary, WRPA 7, an agricultural-based area now shifting to a labor-intensive, manufacturing-based area, will continue to lag behind the Nation in development potentials. This situation may change if effective regional development programs are instituted.



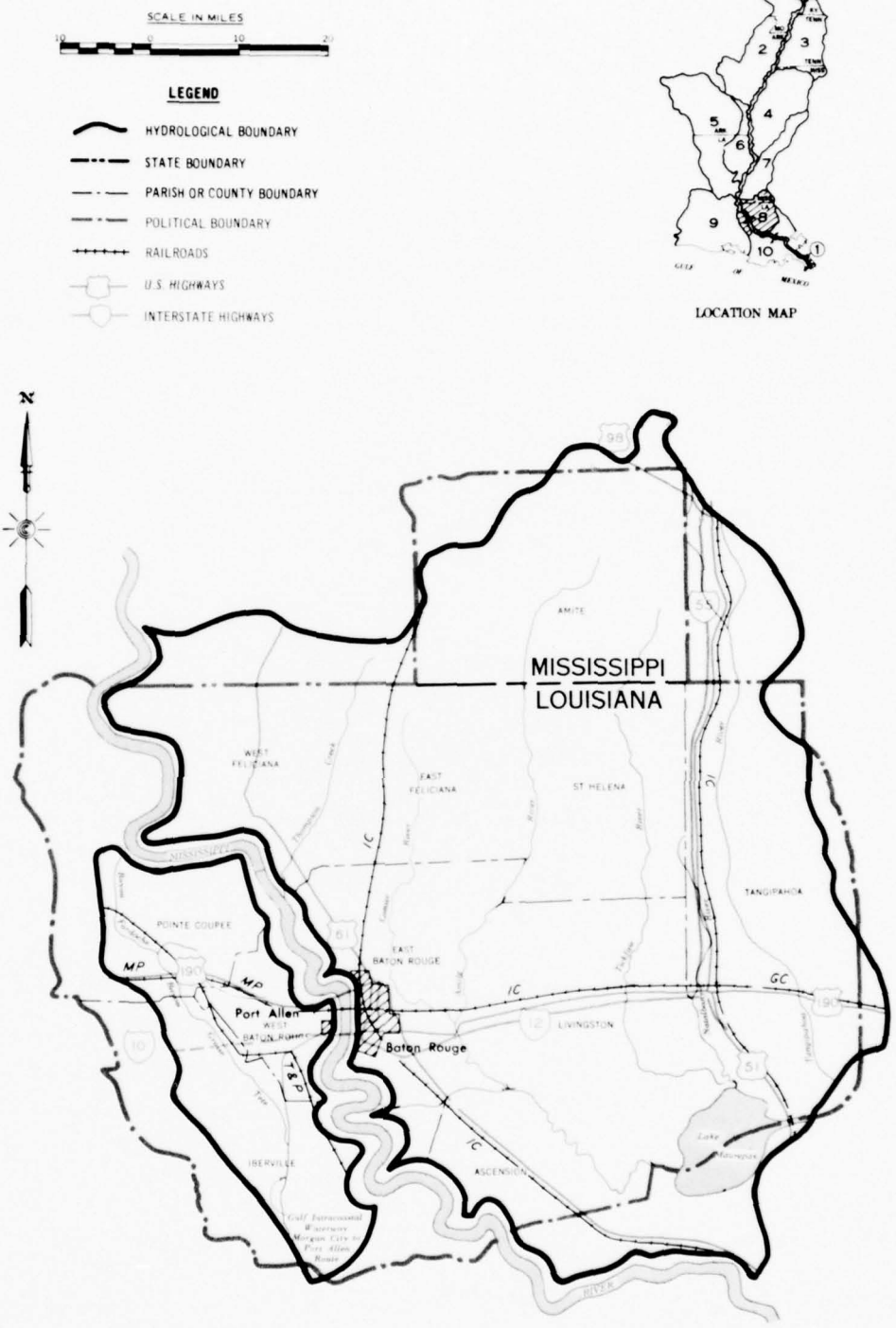
# WRPA 8

# WRPA 8, BATON ROUGE

## PHYSICAL DESCRIPTION

WRPA 8 (figure 19) consists of ten Louisiana parishes in the east-central portion of the State, plus Amite County, Miss. Six of the ten parishes are located along the Mississippi River. Consequently, a large part of the area lies within an alluvial plain. The northeastern portion comprises rolling hill land. More than half of the total area in WRPA 8 is in forest.

The area, which is in subtropical latitudes, has a mild climate due to the warm waters of the Gulf of Mexico and the prevailing southerly winds. The average temperature ranges from a high of 95°F on summer afternoons to a low of 40°F on winter mornings. Average annual rainfall is approximately 60 inches.




LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

**WATER RESOURCE PLANNING AREA 8**

FIGURE 19

## ECONOMIC DESCRIPTION

The economy of WRPA 8 is primarily based upon extensive petrochemical and basic metal industrial developments in the greater Baton Rouge area. An economic profile summary for WRPA 8 is presented in table 73. Additionally, agricultural and timber production are pursuits of lesser economic importance. Water resources have played a prominent role in the development of the area, with the Mississippi River providing a large supply of fresh water as well as a deepwater navigational outlet for local industries.

Table 73 - Economic Profile Summary for WRPA 8

| Parameter | Data for Indicated Years | | | | | |
|---|---|---|---|---|---|---|
| | 1950 | 1959 | 1968 | 1980 | 2000 | 2020 |
| Population (1 July) 1/ | | | | | | |
| Program A | 373,544 | 461,832 | 539,660 | 618,000 | 782,000 | 1,003,000 |
| Program B | -- | -- | -- | 666,000 | 876,000 | 1,139,000 |
| Personal Income 2/ | | | | | | |
| Program A | 523,285 | 815,103 | 1,364,238 | 2,359,000 | 5,474,000 | 12,518,000 |
| Program B | -- | -- | -- | 2,587,000 | 6,331,000 | 14,764,000 |
| Per Capita 2/ | | | | | | |
| Program A | 1,401 | 1,765 | 2,528 | 3,817 | 6,998 | 12,475 |
| Program B | -- | -- | -- | 3,881 | 7,228 | 12,967 |
| Earnings 2/ | | | | | | |
| Total, Program A | 409,173 | 647,758 | 1,093,556 | 1,800,000 | 4,148,000 | 9,528,000 |
| Total, Program B | -- | -- | -- | 1,974,000 | 4,798,000 | 11,237,000 |
| Per Worker 2/ | | | | | | |
| Program A | 3,397 | 4,579 | 6,132 | 8,461 | 14,415 | 24,673 |
| Program B | -- | -- | -- | 8,461 | 14,415 | 24,673 |
| Employment | | | | | | |
| Total, Program A | 120,444 | 141,472 | 178,334 | 213,000 | 288,000 | 386,000 |
| Total, Program B | -- | -- | -- | 233,000 | 333,000 | 455,000 |
| Gross Manufacturing Product 2/ | | | | | | |
| Total, Program A | -- | -- | 532,000 | 890,000 | 2,211,000 | 5,234,000 |
| Total, Program B | -- | -- | -- | 977,000 | 2,555,000 | 6,174,000 |
| Gross Farm Marketing Receipts 2/ | | | | | | |
| Total, Program A | -- | -- | 72,930 3/ | 96,000 | 121,000 | 150,000 |
| Total, Program B | -- | -- | -- | 96,000 | 129,000 | 161,000 |

1/ U. S. Bureau of Census figures show the 1970 population of WRPA 8 as 546,984.
2/ Personal income, total earnings, gross manufacturing product, and gross farm marketing receipt data are given in thousands of 1967 dollars; per capita income and per worker earnings are given in 1967 dollars.
3/ 1970 data.

## Natural Resources

The most important minerals found in WRPA 8 are petroleum, natural gas, natural gas liquids, sand and gravel, salt, and lime. In 1969, the total value of minerals produced amounted to $129 million. Most of the oil and gas fields are located in the western portion of the area; salt is mined in the south; and sand and gravel are produced in the northern part.

Commercial forests contribute significantly to the economy of the area; more than 2.3 million acres (65 percent of the land area) are devoted to woodlands. Hardwood forests consisting of cypress, maple, gum, ash, and oak trees are found in the parishes along the Mississippi River; the rest of the parishes contain softwood (long-leaf pine) forests.

The Mississippi River, as well as smaller rivers and bayous, generally provides a plentiful supply of good quality surface water for WRPA 8. Supplies of high-quality groundwater are also available throughout the area. These available supplies are generally adequate for municipal and industrial needs except in isolated areas subject to pollution from waste disposal. In terms of waterborne commerce, the Mississippi River provides the area with means for shallow- and deep-draft transportation.

## Industrial Development

Baton Rouge, the capital of Louisiana, is a major center of petroleum and chemical industries. It is situated on the Mississippi River 200 miles from the Gulf of Mexico at the head of navigation for ocean-going vessels. The total value of industrial investment along the banks of the Mississippi River in WRPA 8 since 1946 has been $1.9 billion ($0.6 billion between 1946 and 1960 and $1.3 billion between 1961 and 1971). In 1967, East Baton Rouge Parish accounted for 81 percent of the area's $564.1 million value added by manufacturing. Petroleum refineries, the industrial base of the city, are supplied by nearby oil fields in south Louisiana. Many plants in the city either supply refinery needs, further process refinery products, or are engaged in related chemical work.

Five other parishes in WRPA 8 border the Mississippi River and thus are in an excellent position to attract new industry. Earnings and employment by major industries are presented in tables 74 and 75, respectively. Gross product originating and index of output by major industries are presented in tables 76 and 77, respectively. Figure 20 shows historical and projected gross product originating by major industries for WRPA 8.

Table 74 - Earnings by Major Industries in WRPA 8

| Industry | Earnings for Indicated Years, thousands of 1967 dollars | | | | | |
|---|---|---|---|---|---|---|
| | 1950 | 1959 | 1968 | 1980 | 2000 | 2020 |
| Total, Program A | 409,173 | 647,758 | 1,093,556 | 1,800,000 | 4,148,000 | 9,528,000 |
| Total, Program B | -- | -- | -- | 1,974,000 | 4,798,000 | 11,237,000 |
| Per Worker 1/ | | | | | | |
| Program A | 3,397 | 4,579 | 6,132 | 8,461 | 14,415 | 24,673 |
| Program B | -- | -- | -- | 8,461 | 14,415 | 24,673 |
| Agriculture | | | | | | |
| Program A | 52,593 | 33,251 | 42,069 | 28,000 | 36,000 | 63,000 |
| Program B | -- | -- | -- | 30,000 | 41,000 | 74,000 |
| Forestry & Fisheries | | | | | | |
| Program A | 1,641 | 1,218 | 1,430 | 1,700 | 3,100 | 5,600 |
| Program B | -- | -- | -- | 1,900 | 3,600 | 6,600 |
| Mining | | | | | | |
| Program A | W 2/ | W | W | W | W | W |
| Program B | -- | -- | -- | W | W | W |
| Manufacturing | | | | | | |
| Program A | 120,132 | 176,188 | 255,251 | 402,000 | 902,000 | 1,973,000 |
| Program B | -- | -- | -- | 441,000 | 1,043,000 | 2,327,000 |
| Food & Kindred Products | | | | | | |
| Program A | 9,507 | 14,585 | 21,980 | 30,000 | 47,000 | 77,000 |
| Program B | -- | -- | -- | 33,000 | 55,000 | 91,000 |
| Textile Mill Products | | | | | | |
| Program A | W | W | W | W | W | W |
| Program B | -- | -- | -- | W | W | W |
| Chemical & Allied Products | | | | | | |
| Program A | 36,920 | 65,058 | 122,758 | 215,000 | 552,000 | 1,293,000 |
| Program B | -- | -- | -- | 236,000 | 639,000 | 1,525,000 |
| Paper & Allied Products | | | | | | |
| Program A | 0 | 189 | 8,917 | 15,000 | 35,000 | 80,000 |
| Program B | -- | -- | -- | 16,000 | 40,000 | 95,000 |
| Petroleum Refining | | | | | | |
| Program A | 46,500 | 39,100 | 38,200 | 48,000 | 76,000 | 123,000 |
| Program B | -- | -- | -- | 53,000 | 88,000 | 145,000 |
| Primary Metals | | | | | | |
| Program A | 522 | 1,850 | 5,552 | 8,000 | 15,000 | 26,000 |
| Program B | -- | -- | -- | 9,100 | 17,000 | 30,000 |
| Other Manufacturing | | | | | | |
| Program A | 26,683 | 55,406 | 57,844 | 86,000 | 177,000 | 374,000 |
| Program B | -- | -- | -- | 94,000 | 204,000 | 441,000 |
| All Other | | | | | | |
| Program A | 234,807 | 437,101 | 794,806 | 1,368,000 | 3,207,000 | 7,486,000 |
| Program B | -- | -- | -- | 1,501,000 | 3,710,000 | 8,829,000 |

1/ Per worker earnings are given in 1967 dollars.
2/ W—Withheld to avoid disclosing company confidential information.

Table 75 - Employment by Major Industries in WRPA 8

| Industry | Number of Persons Employed in Indicated Years | | | | |
|---|---|---|---|---|---|
| | 1950 | 1960 | 1980 | 2000 | 2020 |
| Total, Program A | 120,444 | 141,472 | 213,000 | 288,000 | 386,000 |
| Total, Program B | -- | -- | 233,000 | 333,000 | 455,000 |
| Agriculture | | | | | |
| Program A | 27,702 | 11,636 | 4,200 | 2,900 | 2,700 |
| Program B | -- | -- | 4,200 | 3,100 | 2,900 |
| Forestry & Fisheries | | | | | |
| Program A | 1,086 | 609 | 690 | 703 | 760 |
| Program B | -- | -- | 760 | 840 | 890 |
| Mining | | | | | |
| Program A | 1,163 | 1,618 | 1,700 | 1,400 | 1,200 |
| Program B | -- | -- | 1,900 | 1,600 | 1,400 |
| Manufacturing | | | | | |
| Program A | 23,603 | 27,214 | 41,000 | 55,000 | 73,000 |
| Program B | -- | -- | 45,000 | 64,000 | 86,000 |
| Food & Kindred Products | | | | | |
| Program A | 2,045 | 2,984 | 3,400 | 3,300 | 3,200 |
| Program B | -- | -- | 3,700 | 3,800 | 3,800 |
| Textile Mill Products | | | | | |
| Program A | 42 | 30 | W 1/ | W | W |
| Program B | -- | -- | W | W | W |
| Chemical & Allied Products | | | | | |
| Program A | 3,992 | 7,690 | 17,000 | 28,000 | 42,000 |
| Program B | -- | -- | 19,000 | 33,000 | 49,000 |
| Paper & Allied Products | | | | | |
| Program A | 571 | 709 | 1,100 | 1,600 | 2,100 |
| Program B | -- | -- | 1,200 | 1,800 | 2,500 |
| Petroleum Refining | | | | | |
| Program A | 7,882 | 6,058 | 4,500 | 4,300 | 4,200 |
| Program B | -- | -- | 5,000 | 5,000 | 5,000 |
| Primary Metals | | | | | |
| Program A | 524 | 580 | 820 | 930 | 1,000 |
| Program B | -- | -- | 900 | 1,100 | 1,200 |
| Other Manufacturing | | | | | |
| Program A | 8,547 | 9,163 | 14,000 | 17,000 | 20,000 |
| Program B | -- | -- | 15,000 | 19,000 | 24,000 |
| All Other | | | | | |
| Program A | 66,890 | 100,395 | 165,000 | 228,000 | 308,000 |
| Program B | -- | -- | 181,000 | 263,000 | 364,000 |

1/ W—Withheld to avoid disclosing company confidential information.

Table 76 - Gross Product Originating by Major Industries in WRPA 8

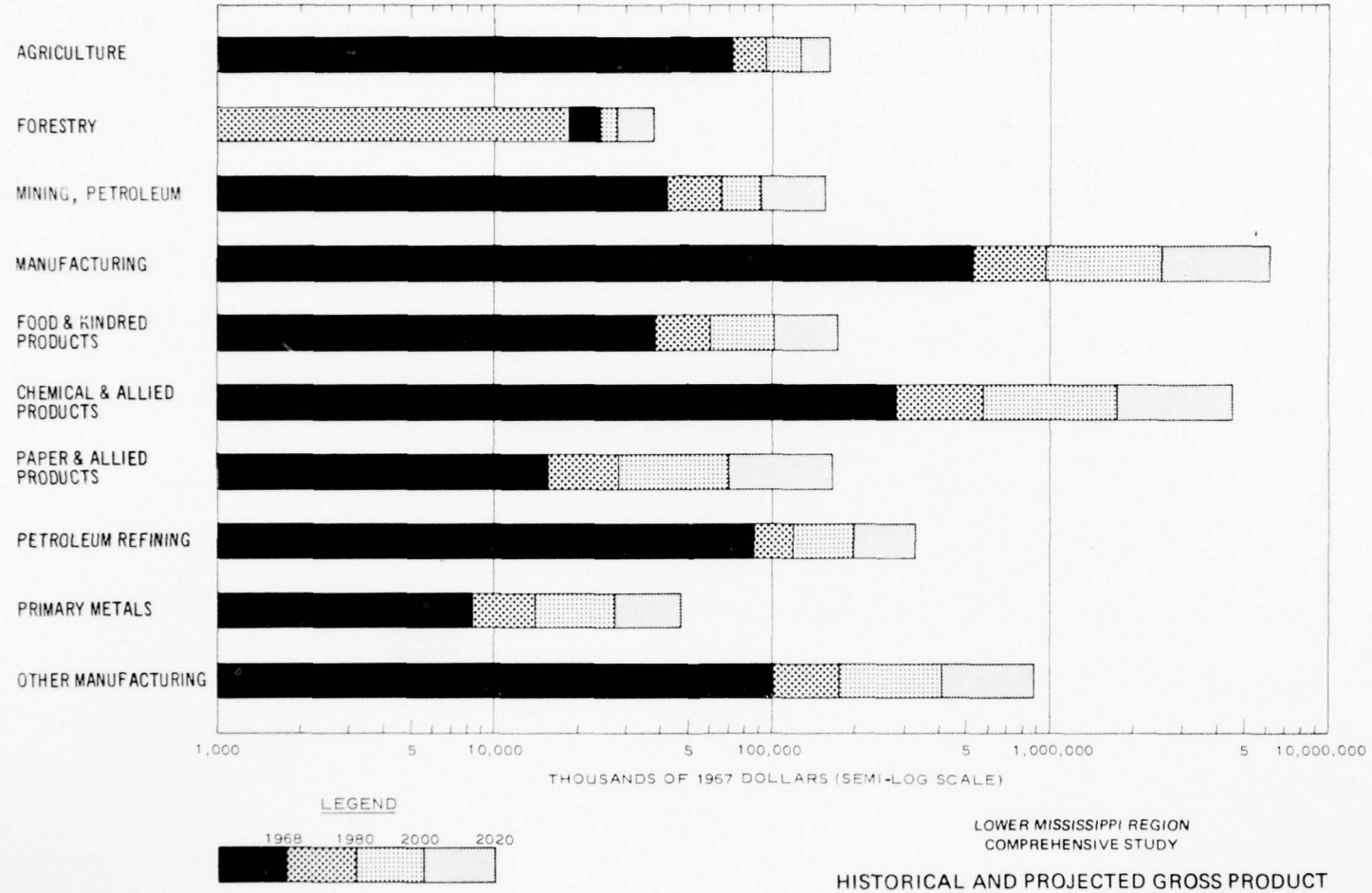
| Industry | Gross Product Originating in Indicated Years thousands of 1967 dollars | | | | |
|---|---|---|---|---|---|
| | 1967 | 1968 | 1980 | 2000 | 2020 |
| Agriculture 1/ | | | | | |
| Program A | -- | 72,930 2/ | 96,000 | 121,000 | 150,000 |
| Program B | -- | -- | 96,000 | 129,000 | 161,000 |
| Forestry 3/ | | | | | |
| Program A | -- | 20,800 2/ | 17,000 | 23,000 | 26,000 |
| Program B | -- | -- | 18,000 | 28,000 | 38,000 |
| Mining, Petroleum | | | | | |
| Program A | 41,965 | 42,385 | 61,000 | 79,000 | 133,000 |
| Program B | -- | -- | 67,000 | 92,000 | 157,000 |
| Quarrying | | | | | |
| Program A | W 4/ | W | W | W | W |
| Program B | -- | -- | W | W | W |
| Manufacturing | | | | | |
| Program A | 458,700 | 532,000 | 890,000 | 2,211,000 | 5,234,000 |
| Program B | -- | -- | 977,000 | 2,555,000 | 6,174,000 |
| Food & Kindred Products | | | | | |
| Program A | 38,234 | 38,999 | 55,000 | 88,000 | 145,000 |
| Program B | -- | -- | 60,000 | 102,000 | 171,000 |
| Textile Mill Products | | | | | |
| Program A | W | W | W | W | W |
| Program B | -- | -- | W | W | W |
| Chemical & Allied Products | | | | | |
| Program A | 240,690 | 281,607 | 530,000 | 1,519,000 | 3,878,000 |
| Program B | -- | -- | 581,000 | 1,757,000 | 4,573,000 |
| Paper & Allied Products | | | | | |
| Program A | 12,991 | 15,459 | 26,000 | 61,000 | 140,000 |
| Program B | -- | -- | 28,000 | 70,000 | 165,000 |
| Petroleum Refining | | | | | |
| Program A | 68,930 | 86,163 | 109,000 | 171,000 | 274,000 |
| Program B | -- | -- | 119,000 | 198,000 | 324,000 |
| Primary Metals | | | | | |
| Program A | 4,639 | 8,257 | 13,000 | 23,000 | 40,000 |
| Program B | -- | -- | 14,000 | 27,000 | 47,000 |
| Other Manufacturing | | | | | |
| Program A | 93,216 | 101,515 | 157,000 | 349,000 | 757,000 |
| Program B | -- | -- | 175,000 | 401,000 | 894,000 |

1/ Marketing receipts.
2/ 1970 data.
3/ Value at local point of delivery including stumpage, cutting, and hauling.
4/ W—Withheld to avoid disclosing company confidential information.

Table 77 - Index of Output by Major Industries in WRPA 8

| Industry | Index of Output for Indicated Years 1/ | | | | |
|---|---|---|---|---|---|
| | 1967 | 1968 | 1980 | 2000 | 2020 |
| Agriculture | | | | | |
| Program A | -- | 100 2/ | 132 | 166 | 206 |
| Program B | -- | -- | 132 | 178 | 221 |
| Forestry | | | | | |
| Program A | -- | 100 2/ | 82 | 112 | 124 |
| Program B | -- | -- | 88 | 134 | 181 |
| Mining, Petroleum | | | | | |
| Program A | 100 | 101 | 146 | 189 | 318 |
| Program B | -- | -- | 160 | 219 | 375 |
| Quarrying | | | | | |
| Program A | 100 | 84 | 109 | 176 | 301 |
| Program B | -- | -- | 120 | 204 | 355 |
| Manufacturing | | | | | |
| Program A | 100 | 116 | 194 | 482 | 1,141 |
| Program B | -- | -- | 213 | 557 | 1,346 |
| Food & Kindred Products | | | | | |
| Program A | 100 | 102 | 143 | 231 | 379 |
| Program B | -- | -- | 157 | 267 | 447 |
| Textile Mill Products | | | | | |
| Program A | -- | -- | -- | -- | -- |
| Program B | -- | -- | -- | -- | -- |
| Chemical & Allied Products | | | | | |
| Program A | 100 | 117 | 220 | 631 | 1,611 |
| Program B | -- | -- | 241 | 730 | 1,900 |
| Paper & Allied Products | | | | | |
| Program A | 100 | 119 | 197 | 469 | 1,074 |
| Program B | -- | -- | 216 | 542 | 1,267 |
| Petroleum Refining | | | | | |
| Program A | 100 | 125 | 158 | 248 | 398 |
| Program B | -- | -- | 173 | 287 | 469 |
| Primary Metals | | | | | |
| Program A | 100 | 178 | 275 | 496 | 852 |
| Program B | -- | -- | 302 | 574 | 1,005 |
| Other Manufacturing | | | | | |
| Program A | 100 | 109 | 168 | 374 | 812 |
| Program B | -- | -- | 188 | 430 | 959 |

1/ 1967 = 100.
2/ 1970 = 100.




*LOWER MISSISSIPPI REGION*
COMPREHENSIVE STUDY

HISTORICAL AND PROJECTED GROSS PRODUCT ORIGINATING BY MAJOR INDUSTRIES

WRPA 8 PROGRAM B

FIGURE 20

## Agricultural Development

In 1949, there were 20,654 farms averaging 87 acres each in WRPA 8. Fifty percent of the WRPA area, or 1.8 million acres, was in farms. By 1970, there were only 10,261 farms, a decline of 50 percent over the 21-year period. These farms encompassed 1.5 million acres of land, or 40 percent of the area, a decline of 17 percent since 1949. However, by 1970 the farms had increased to an average size of 146 acres each.

Historically, cropland acreage has represented less than 50 percent of the total farmland, ranging from 40 percent in 1949 to 33 percent in 1970. During this period, the amount of farm forest land declined from 751,000 to 537,000 acres. Land utilized as permanent pasture increased from 229,000 acres in 1949 to 363,000 acres in 1970. Other farmland accounted for approximately 4 percent of the total land in farms. In 1970, 5,564 of the 10,261 farms in WRPA 8 were noncommercial.

In 1970, the total value of all farm products sold was $72.9 million. Of this, 67 percent of the total farm receipts, or nearly $49 million, accrued from the sales of livestock and livestock products. Total gross farm income was $84.8 million, realized net farm income $25.4 million, and derived net income per farm $2,479. Hay, sugarcane, soybeans, corn, and cotton, the major crops produced in 1970, accounted for 91 percent of the total harvested acreage. Agricultural output in WRPA 8 is presented in table 78.

Table 78 - Agricultural Production (Crops and Livestock) in WRPA 8

| Commodity | Unit of Measurement | Data for Indicated Years 1959 | 1970 | 1980 | 2000 | 2020 |
|---|---|---|---|---|---|---|
| Cotton | Bales | | | | | |
| Program A 1/ | | 9,253 | 12,539 | 0 | 0 | 0 |
| Program B 1/ | | -- | -- | 0 | 0 | 0 |
| Corn | Bushels | | | | | |
| Program A | | 2,189,923 | 1,230,000 | 561,000 | 775,000 | 927,000 |
| Program B | | -- | -- | 561,000 | 832,000 | 995,000 |
| Sorghum | Bushels | | | | | |
| Program A | | 4,207 | 64,500 | 116,000 | 149,000 | 207,000 |
| Program B | | -- | -- | 116,000 | 160,000 | 222,000 |
| Oats | Bushels | | | | | |
| Program A | | 138,723 | 105,000 | 103,000 | 107,000 | 111,000 |
| Program B | | -- | -- | 103,000 | 115,000 | 119,000 |
| Rice | Bushels | | | | | |
| Program A | | 131,346 | 0 | 10,000 | 12,000 | 14,000 |
| Program B | | -- | -- | 10,000 | 13,000 | 15,000 |
| Irish Potatoes | Bushels | | | | | |
| Program A | | 76,307 | 75,000 | 97,000 | 126,000 | 164,000 |
| Program B | | -- | -- | 97,000 | 136,000 | 176,000 |
| Sweet Potatoes | Bushels | | | | | |
| Program A | | 755,342 | 630,000 | 591,000 | 613,000 | 768,000 |
| Program B | | -- | -- | 591,000 | 658,000 | 825,000 |
| Tobacco | Pounds | | | | | |
| Program A | | 0 | 0 | 0 | 0 | 0 |
| Program B | | -- | -- | 0 | 0 | 0 |
| Sugarcane | Tons | | | | | |
| Program A | | 1,083,214 | 1,566,000 | 1,561,000 | 1,816,000 | 2,038,000 |
| Program B | | -- | -- | 1,561,000 | 1,951,000 | 2,189,000 |
| Wheat | Bushels | | | | | |
| Program A | | 350 | 25,000 | 66,000 | 80,000 | 88,000 |
| Program B | | -- | -- | 66,000 | 85,000 | 95,000 |
| Soybeans | Bushels | | | | | |
| Program A | | 5,711 | 1,453,426 | 2,822,000 | 3,478,000 | 4,077,000 |
| Program B | | -- | -- | 2,822,000 | 3,736,000 | 4,378,000 |

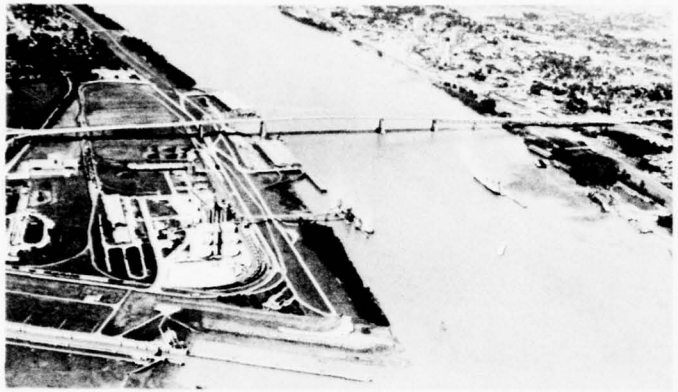
1/ Program A data incorporates 1970 production estimates; Program B data reflect the projected national growth rate shown in Table II-3, Selected Agricultural Products, pages II-18 through II-22, Volume 1, Economic Activity in The United States by Water Resource Regions and Subareas, Historical and Projected, 1929-2020, United States Water Resources Council, April 1971.

Table 78 - Agricultural Production (Crops and Livestock) in WRPA 8 (Con.)

| Commodity | Unit of Measurement | Data for Indicated Years 1959 | 1970 | 1980 | 2000 | 2020 |
|---|---|---|---|---|---|---|
| Forest Products 2/ | Thousands of Cubic Feet | | | | | |
| Program A | | -- | 99,600 | 82,000 | 111,000 | 123,000 |
| Program B | | -- | -- | 88,000 | 133,000 | 180,000 |
| Hay | Tons | | | | | |
| Program A | | 88,214 | 126,403 | 191,000 | 235,000 | 290,000 |
| Program B | | -- | -- | 191,000 | 253,000 | 312,000 |
| Gross Value of Crops | Thousands of 1967 Dollars | | | | | |
| Program A | | 15,000 | 24,000 | 37,000 | 44,000 | 51,000 |
| Program B | | -- | -- | 37,000 | 47,000 | 56,000 |
| | | Livestock Thousands 3/ | | | | |
| Beef | Pounds | | | | | |
| Program A | | -- | 74,375 | 94,746 | 127,534 | 171,276 |
| Program B | | -- | -- | 94,746 | 137,002 | 183,930 |
| Pork | Pounds | | | | | |
| Program A | | -- | 5,842 | 6,645 | 8,680 | 11,267 |
| Program B | | -- | -- | 6,645 | 9,324 | 12,099 |
| Lamb | Pounds | | | | | |
| Program A | | -- | 27 | 21 | 24 | 30 |
| Program B | | -- | -- | 21 | 26 | 32 |
| Chickens | Pounds | | | | | |
| Program A | | -- | 33,776 | 47,123 | 65,799 | 88,340 |
| Program B | | -- | -- | 47,123 | 70,684 | 94,866 |
| Turkeys | Pounds | | | | | |
| Program A | | -- | 72 | 96 | 135 | 182 |
| Program B | | -- | -- | 96 | 145 | 195 |
| Eggs | Dozen | | | | | |
| Program A | | -- | 28,307 | 31,081 | 39,786 | 50,395 |
| Program B | | -- | -- | 31,081 | 42,740 | 54,118 |
| Milk | Pounds | | | | | |
| Program A | | -- | 376,900 | 346,092 | 427,166 | 521,684 |
| Program B | | -- | -- | 346,092 | 458,878 | 560,225 |
| Gross Value of Livestock | 1967 Dollars | | | | | |
| Program A | | 26,727 | 48,936 | 58,789 | 76,497 | 98,652 |
| Program B | | -- | -- | 58,789 | 82,176 | 105,939 |

2/ Includes sawlogs, veneer logs, pulpwood, poles, etc., cut for industrial or consumer uses. (U. S. Forest Service.)

3/ Net liveweight production.



Baton Rouge Harbor



Chemical plant at Burnside, La.



Agricultural land in WRPA 8



Downtown Baton Rouge, La.

## HISTORICAL TRENDS

### Population

The population of WRPA 8 grew from 297,755 in 1940 to 546,984 in 1970 (table 73), an increase of 84 percent. The trend for movement from rural to urban areas was evidenced from 1940 to 1970 with a gain in the population of urban areas being reported in almost every parish. Urban population increased from 20 percent (estimated) of the total in 1940 to about 58 percent in 1970.

In terms of numbers of people, the parish of East Baton Rouge, with a 1970 population of 285,167, has been the leader in population growth with an increase of 196,752 from 1940 to 1970. Part of this increase resulted from a number of the younger residents of the job-deficient parishes moving to Baton Rouge to find employment in industrial and commercial occupations.

### Employment

Total employment in WRPA 8 increased from 97,842 in 1940 to 178,344 in 1968, an increase of 82 percent (table 75). The greatest increase was in the manufacturing sector, with the chemical and allied products industries leading the growth by showing an estimated 560 percent gain. By 1960, 30 percent of the total employees engaged in manufacturing were in the chemical and allied products industry. Losses un manpower occurred in the agriculture, forestry, and fisheries industries and in the petroleum refining industry of the manufacturing sector. Historically, employment as a percentage of population has remained almost constant at 33 percent.

### Personal and Per Capita Income

Although the per capita income of WRPA 8 is low as compared with the national average, there has been a recent history of good growth. In 1940, per capita income for the area was $785 (1967 dollars), or 53 percent of the national average. According to data for 1968, per capita income increased to $2,528, or 77 percent of the United States average. This steady increase in the rate of per capita income growth relative to the United States can be attributed in part to the movement of industry into the area along the Mississippi River and in part to the shift of the population from rural areas to urban areas where employment opportunities were more readily available. Per worker earnings have also increased from $2,040 (1967 dollars) in 1940 to $6,132 in 1968.

## ECONOMIC PROBLEMS

As of January 1972, seven of the ten Louisiana parishes plus Amite County, Miss., qualified for Federal assistance under the Public Works and Economic Development Act of 1965. Under this act, qualified areas can obtain public works grants and loans and business development loans in hopes of generating new jobs through industrial and commercial growth. Qualification is generally based on persistently high unemployment rates or low median family incomes.

St. Helena Parish qualifies under both conditions, Amite County under low median family income, and Ascension, Iberville, Livingston, Pointe Coupee, Tangipahoa, and West Feliciana Parishes under high unemployment rates.

### Low Income Levels

WRPA 8 suffers from chronic low income levels. Although the higher Baton Rouge SMSA figures pull up the per capita income for the entire area, in 1968 the per capita income of WRPA 8 was only 77 percent as high as that of the Nation. One of the reasons for this condition is the relatively large portion of the population still inhabiting the rural areas where low-salaried positions are prevalent. Another relates to the capital-intensive nature of the industries located within the area.

### Unemployment and Underemployment

Unemployment has been a severe problem. In 1971, seven of the ten Louisiana parishes in WRPA 8 had unemployment rates which exceeded the national rate of 5.9 percent. Three parishes had unemployment rates which exceeded 8 percent. Two more parishes had unemployment rates which exceeded 10 percent; Livinggston Parish experienced an unemployment rate of 14.4 percent. In 1971, Amite County, Miss., had an unemployment rate of 3.3 percent.

### Population Loss

Population losses in WRPA 8 are not significant, although there is a trend for the younger and more able residents to move to urban areas to improve their earning capability. Primary movement is to Baton Rouge and New Orleans, where more industrial and commercial employment is available to qualified men and women.

Population losses occurred in Amite County and in East Feliciana,

Pointe Coupee, and West Feliciana Parishes during the period 1940-1970. Amite County has continually lost population, and the above-mentioned parishes have had long-trend net losses in population.

## PROGRAM A, NATIONAL INCOME

Substantial growth through 2020 for WRPA 8 has been projected. Studies indicate that by 2020 total personal income will grow to over $12 billion and that per capita earnings will increase to $12,475. This would provide an increase in per capita income to 87 percent of the United States average. Per worker earnings are projected to reach $24,673 in 2020, or 93 percent of the national average at that time.

Studies project that employment will increase 117 percent from the 1968 total of 178,344 to 386,000 by 2020. The employment participation rate is also projected to increase from 0.33 in 1968 to 0.38 in 2020.

Population projections indicate that the population will increase by 83 percent from the 1970 total to an estimated 1,003,000 in 2020. The projections also indicate that population losses will continue in rural areas as more of the work force moves into urban locations.

## PROGRAM B, REGIONAL DEVELOPMENT

Although there have recently been some important gains in WRPA 8, for decades the overall economic growth of the area has lagged behind that of the Nation. The Water Resource Council recognizes five principal objectives applicable to such areas: (1) increased income; (2) increased regional employment; (3) diversification of the economic base; (4) improvement in the quality of education, health, recreation, and related services; and (5) improved income distribution. The economic projections of Program A anticipate continuous growth in WRPA 8 to the year 2020. If there is accelerated regional development, however, a second set of higher projections, as outlined in Program B, is expected to apply.

Both Programs A and B predict a trend toward diversification of the economic base, from agriculture and manufacturing to commerce and services. The dependency on agriculture declined from 12.8 percent of total earnings in 1950 to 3.8 percent in 1968. By 2020, only 0.7 percent of total earnings will be from agriculture. Manufacturing directly accounted for 29.4 percent of total earnings in 1950 but for only 23.3 percent in 1968. By 2020, 20.7 percent of total earnings will come from manufacturing.

With an adjusting economic base, WRPA 8 needs to generate accelerated productivity if the economy of the area is to exceed the projections of Program A. Agricultural productivity is expected to increase by 106 percent by 2020 but will need to increase by 121 percent to meet Program B projections. The productivity of the forest industry is expected to increase by 23 percent from 1970 to 2020 but will need to increase by 80 percent to meet Program B projections. The mining and petroleum industries are expected to grow in productivity 218 percent by 2020 or 275 percent under the accelerated program. Quarrying productivity is expected to expand 200 percent by 2020 under Program A and 255 percent under Program B. Manufacturing productivity is expected to increase 1,041 percent by 2020 under Program A and 1,246 percent under Program B. Of the manufacturing industries, the chemical and allied products industry is expected to grow in productivity 1,151 percent by 2020 under Program A and 1,800 percent under Program B. The paper and allied products industry ranks second in anticipated manufacturing productivity with expected growth of 974 percent by 2020 under Program A and 1,167 percent under Program B. The primary metals industry is expected to grow by 752 percent by 2020 under Program A and 905 percent under Program B.

If WRPA 8 realizes the increased productivity and economic diversity of Program B projections, it is also expected to gain employment, income, and population at an accelerated rate. From 1950 to 1968, the employment growth rate for WRPA 8 was almost 2.2 percent per year

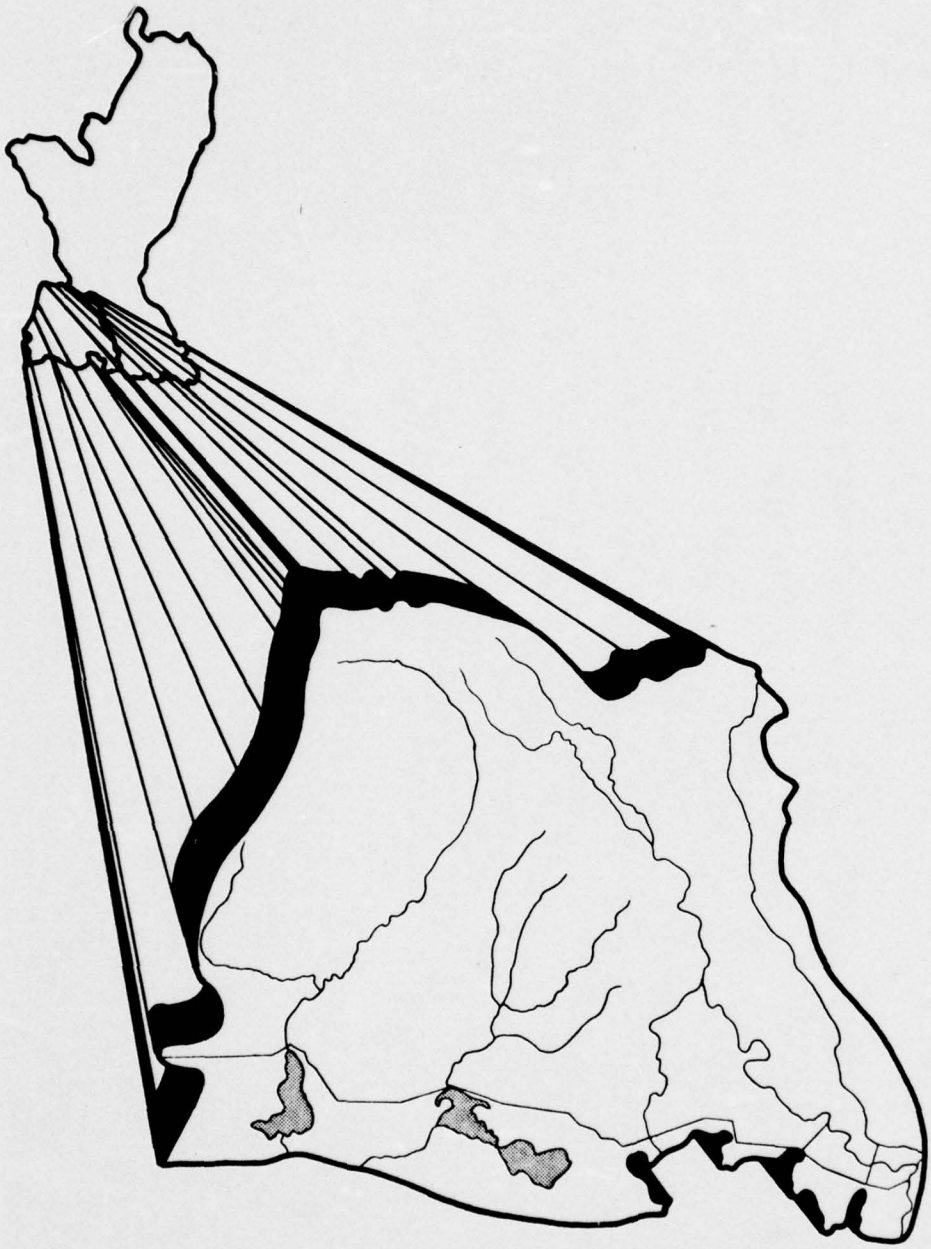
(compounded annually, as are all of the following growth rates). The population grew at a rate of just under 2.1 percent per year. Both employment and population grew at rates higher than those of the Nation. It should be noted, however, that the Baton Rouge SMSA, which grew at a rate of 3 percent per year, accounted for much of the population increase in WRPA 8. If employment and population trends follow Program A projections from 1968 to 2020, the annual growth rates will be 1.5 percent for employment and just under 1.2 percent for population. If Program B projections for employment and population are met, the growth rates will be slightly more than 1.8 percent for employment and 1.4 percent for population. National employment is expected to grow 1.4 percent per year, and national population is expected to grow slightly more than 1.3 percent annually from 1968 to 2020. In 1950, the per capita income of WRPA 8 was $1,401 and by 1968 it had increased to $2,528, a growth of 3.4 percent annually. Per capita income is expected to grow from $2,528 to $12,475 by 2020 according to Program A projections. This represents an annual growth of 3.1 percent. Program B projections for per capita income are slightly higher, with $12,967 expected by 2020, a 3.2 percent annual growth rate. The per capita income for the United States was $2,065 in 1950 and $3,301 in 1968, a growth of 2.6 percent annually. By 2020, it is expected to be $14,260, which would represent a growth of almost 2.9 percent annually. Per worker earnings in WRPA 8 grew from $3,397 in 1950 to $6,132 per year in 1968, an annual growth rate of 3.4 percent. Under both Programs A and B, it is projected that per worker earnings in 2020 will be $24,673 in WRPA 8, a growth of 2.7 percent annually. This projected rate of growth is equal to that for the Nation.

## OUTLOOK FOR THE FUTURE

WRPA 8 is expected to continue a trend toward urbanization and increased industrialization centered around the metropolitan area of Baton Rouge. Continued increases in urban as well as total population are foreseen for the projection period (1968-2020). The population growth rate (1.2 percent) is expected to be more than that of the region (0.9 percent) but slightly less than the national average (1.3 percent).

Personal income and earnings are expected to grow at rates above the national average, with per capita income and per worker earnings drawing closer to the national norm. By 2020, per capita income and per worker earnings will reach 88 percent and 95 percent, respectively, of the national averages. Manufacturing and Government are projected to be the major contributors to total earnings, with over half of the earnings growth in manufacturing occurring in the petrochemical industry. As the economy becomes more affluent and production efficiencies increase, added emphasis will be placed on trade and services making these two industry sectors large contributors to total earnings.

Employment is projected to experience a 1.5 percent rate of growth which is greater than that for the region (1.1) and that for the Nation (1.4). Since Baton Rouge is the capital of Louisiana, Government is expected to continue its leadership in this economic category.



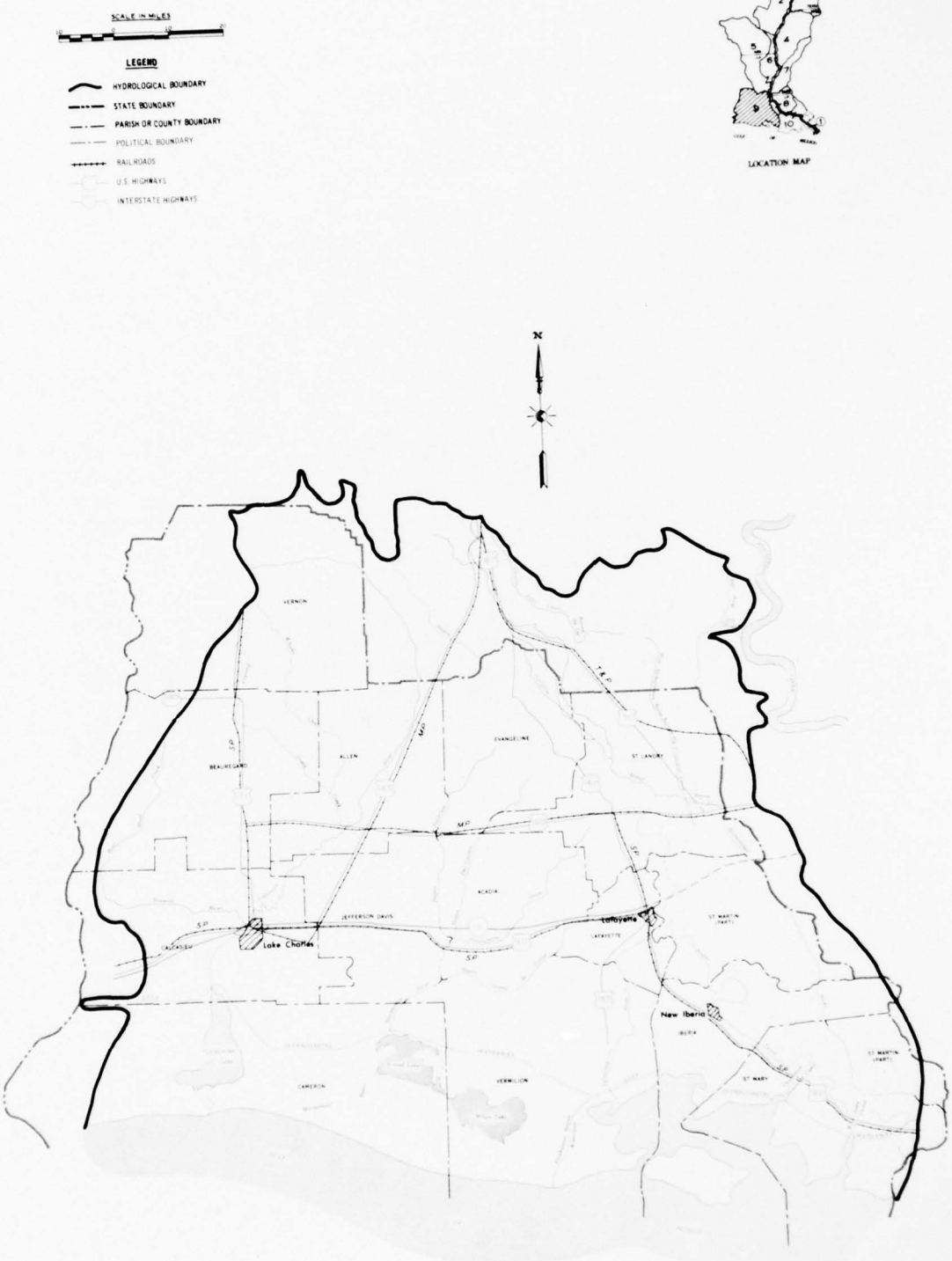
# WRPA 9

# WRPA 9, LAKE CHARLES - LAFAYETTE

## PHYSICAL DESCRIPTION

WRPA 9 (figure 21) comprises 14 parishes in southwestern Louisiana which extend to the Gulf of Mexico from the Texas border on the west and to the Atchafalaya Basin on the east. Topographic features range from the coastal marshes in the southern portion to pine- and meadow-covered plains in the central portion to wooded hills in the northern portion. The marshes are bordered on the seaward side by barrier beaches, composed mainly of fine sand, which rise to a crest of a few feet above sea level and support groves of live oak on their inner slopes. Sand and shell ridges, sometimes rising several feet above ground level, can be found throughout the marshes. These ridges, or chenieres, represent former barrier beaches. The prairie lands in the central portion of the area make up a flat sloping plain declining in elevation from 60 ft above sea level, with the descent averaging about 1 ft/mile. The wooded portion in the north consists of rolling hills studded with longleaf and shortleaf pine.

The geographic position of WRPA 9, at subtropical latitudes adjacent to the large and warm expanse of water in the Gulf of Mexico, is the major influence that determines the area's climate. Summers are hot and winters are mild, with average monthly temperatures ranging from 82°F in August to 54°F in January. Normal annual precipitation amounts to approximately 38 inches.




LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

# WATER RESOURCE PLANNING AREA 9

FIGURE 21

## ECONOMIC DESCRIPTION

The economy of WRPA 9 is based upon an abundance of natural mineral deposits, fertile soils for agricultural production, and large timbered areas. Especially important in the local economy is the Army Training Center at Fort Polk. An economic profile summary for WRPA 9 is presented in table 79. Fish and wildlife resources are plentiful.

Table 79 - Economic Profile Summary for WRPA 9

| Parameter | Data for Indicated Years | | | | | |
|---|---|---|---|---|---|---|
| | 1950 | 1959 | 1968 | 1980 | 2000 | 2020 |
| Population (1 July) 1/ | | | | | | |
| Program A | 534,509 | 645,826 | 750,899 | 770,000 | 860,000 | 994,000 |
| Program B | -- | -- | -- | 824,000 | 973,000 | 1,117,000 |
| Personal Income 2/ | | | | | | |
| Program A | 665,956 | 1,045,584 | 1,761,977 | 2,583,000 | 5,242,000 | 10,817,000 |
| Program B | -- | -- | -- | 2,832,000 | 6,063,000 | 12,757,000 |
| Per Capita 2/ | | | | | | |
| Program A | 1,246 | 1,619 | 2,346 | 3,356 | 6,098 | 10,883 |
| Program B | -- | -- | -- | 3,438 | 6,228 | 11,418 |
| Earnings 2/ | | | | | | |
| Total, Program A | 525,113 | 838,518 | 1,397,077 | 2,019,000 | 4,028,000 | 8,222,000 |
| Total, Program B | -- | -- | -- | 2,213,000 | 4,659,000 | 9,697,000 |
| Per Worker 2/ | | | | | | |
| Program A | 3,232 | 4,294 | 5,508 | 7,672 | 13,307 | 22,846 |
| Program B | -- | -- | -- | 7,672 | 13,307 | 22,846 |
| Employment | | | | | | |
| Total, Program A | 162,484 | 195,256 | 253,643 | 263,000 | 303,000 | 360,000 |
| Total, Program B | -- | -- | -- | 288,000 | 350,000 | 425,000 |
| Gross Manufacturing Product 2/ | | | | | | |
| Total, Program A | -- | -- | 369,000 | 596,000 | 1,309,000 | 2,809,000 |
| Total, Program B | -- | -- | -- | 654,000 | 1,513,000 | 3,315,000 |
| Gross Farm Marketing Receipts 2/ | | | | | | |
| Total, Program A | -- | -- | 173,745 3/ | 233,000 | 282,000 | 339,000 |
| Total, Program B | -- | -- | -- | 233,000 | 303,000 | 364,000 |

1/ U. S. Bureau of Census figures show the 1970 population of WRPA 9 as 748,433.
2/ Personal income, total earnings, gross manufacturing product, and gross farm marketing receipt data are given in thousands of 1967 dollars; per capita income and per worker earnings are given in 1967 dollars.
3/ 1970 data.

In addition to these favorable conditions, the area has a highly developed inland waterway system and a deep-draft channel.

## Natural Resources

WRPA 9 is rich in oil, natural gas, salt, sulfur, sand and gravel, and clays. The development of oil and natural gas resources has contributed more than any other factor to the progress of the area and to the rapid strides made in the raising of living standards and industrial growth. Oil and gas fields are located throughout the area as well as offshore in the Gulf of Mexico. Salt deposits are located on the eastern and western borders, and sulfur is mined in Calcasieu Parish. Sand and gravel are produced in nine parishes, and clays are mined in two. The total value of mineral production in WRPA 9 in 1969 was $1.57 billion, or 33 percent of the Louisiana total of $4.7 billion.

The numerous lakes and streams and the vast marshlands of the area offer fishing and hunting grounds on a gigantic scale. Fresh and salt water fishing serve as great sources of recreation and provide income for commercial fishermen in any season. Shrimp, crabs, crayfish, finfish, and menhaden are all harvested commercially. Fur trapping and waterfowl hunting are both popular throughout the marsh area. Wildlife hunted in the upland wooded areas consists of deer, rabbits, wild turkeys, and wild hogs. Several large refuge and management areas are operated to provide protection for wildlife.

Commercial forests covered 3,284,000 acres (41 percent) of the total land area of WRPA 9 in 1970. Southern pine forests are predominant in the area (42 percent of forest acreage) with oak-gum cypress stands also of importance (31 percent). Vernon and Beauregard Parishes are the most heavily forested areas, with over 85 percent of their total land area being in forest acreage.

Good quality surface water and groundwater is available in most parts of the area in abundant supply. Groundwater is the primary source of municipal water and is also used for industrial process water and irrigation. Very heavy demands on groundwater supplies are made in the Lake Charles industrial area. Surface supplies constitute the primary source of cooling water and water for rice irrigation. Salt water intrusion during prolonged dry periods in some areas along the Gulf has affected the quality of the water supply and severely limited its use.

## Industrial Development

Earnings and employment by major industries in WRPA 9 are given in tables 80 and 81, respectively. Gross product originating and an index of output by major industries are presented in tables 82 and 83, respectively. Figure 22 is a chart showing historical and projected gross product originating by major industries for WRPA 9.

A combination of varied natural resources, water access,

Table 80 - Earnings by Major Industries in WRPA 9

| Industry | Earnings for Indicated Years, thousands of 1967 dollars | | | | | |
|---|---|---|---|---|---|---|
| | 1950 | 1959 | 1968 | 1980 | 2000 | 2020 |
| Total, Program A | 525,113 | 838,518 | 1,397,077 | 2,019,000 | 4,028,000 | 8,222,000 |
| Total, Program B | -- | -- | -- | 2,213,000 | 4,659,000 | 9,697,000 |
| Per Worker 1/ | | | | | | |
| Program A | 3,232 | 4,294 | 5,508 | 7,672 | 13,307 | 22,846 |
| Program B | -- | -- | -- | 7,672 | 13,307 | 22,846 |
| Agriculture | | | | | | |
| Program A | 118,307 | 91,411 | 133,941 | 104,000 | 124,000 | 210,000 |
| Program B | -- | -- | -- | 114,000 | 143,000 | 248,000 |
| Forestry & Fisheries | | | | | | |
| Program A | 4,933 | 2,952 | 3,199 | 4,200 | 8,000 | 14,000 |
| Program B | -- | -- | -- | 4,600 | 9,200 | 17,000 |
| Mining | | | | | | |
| Program A | 46,453 | 107,255 | 147,156 | 216,000 | 330,000 | 467,000 |
| Program B | -- | -- | -- | 236,000 | 382,000 | 551,000 |
| Manufacturing | | | | | | |
| Program A | 83,825 | 112,259 | 184,726 | 287,000 | 591,000 | 1,221,000 |
| Program B | -- | -- | -- | 314,000 | 684,000 | 1,440,000 |
| Food & Kindred Products | | | | | | |
| Program A | 22,750 | 23,319 | 33,009 | 38,000 | 54,000 | 81,000 |
| Program B | -- | -- | -- | 42,000 | 62,000 | 96,000 |
| Textile Mill Products | | | | | | |
| Program A | W 2/ | W | W | W | W | W |
| Program B | -- | -- | -- | W | W | W |
| Chemical & Allied Products | | | | | | |
| Program A | 15,891 | 25,422 | 39,849 | 69,000 | 152,000 | 333,000 |
| Program B | -- | -- | -- | 75,000 | 176,000 | 392,000 |
| Paper & Allied Products | | | | | | |
| Program A | 1,986 | 5,013 | 5,373 | 14,000 | 30,000 | 65,000 |
| Program B | -- | -- | -- | 15,000 | 35,000 | 77,000 |
| Petroleum Refining | | | | | | |
| Program A | 20,177 | 33,405 | 54,144 | 75,000 | 139,000 | 251,000 |
| Program B | -- | -- | -- | 82,000 | 160,000 | 296,000 |
| Primary Metals | | | | | | |
| Program A | W | W | W | W | W | W |
| Program B | -- | -- | -- | W | W | W |
| Other Manufacturing | | | | | | |
| Program A | 23,021 | 25,100 | 52,317 | 91,000 | 216,000 | 491,000 |
| Program B | -- | -- | -- | 100,000 | 250,000 | 579,000 |
| All Other | | | | | | |
| Program A | 271,595 | 524,641 | 928,055 | 1,370,000 | 2,975,000 | 6,310,000 |
| Program B | -- | -- | -- | 1,544,000 | 3,440,000 | 7,441,000 |

1/ Per worker earnings are given in 1967 dollars.
2/ W—Withheld to avoid disclosing company confidential information.

Table 81 - Employment by Major Industries in WRPA 9

| Industry | Number of Persons Employed in Indicated Years | | | | | |
|---|---|---|---|---|---|---|
| | 1950 | 1959 | 1968 | 1980 | 2000 | 2020 |
| Total, Program A | 162,484 | 195,256 | 253,643 | 263,000 | 303,000 | 360,000 |
| Total, Program B | -- | -- | -- | 288,000 | 350,000 | 425,000 |
| Agriculture | | | | | | |
| Program A | 46,178 | 26,222 | 19,023 | 15,000 | 10,000 | 10,000 |
| Program B | -- | -- | -- | 16,000 | 12,000 | 12,000 |
| Forestry & Fisheries | | | | | | |
| Program A | -- | -- | -- | -- | -- | -- |
| Program B | -- | -- | -- | -- | -- | -- |
| Mining | | | | | | |
| Program A | 8,216 | 13,526 | 15,472 | 15,000 | 15,000 | 15,000 |
| Program B | -- | -- | -- | 17,000 | 18,000 | 18,000 |
| Manufacturing | | | | | | |
| Program A | 20,699 | 23,436 | 28,662 | 32,000 | 40,000 | 50,000 |
| Program B | -- | -- | -- | 35,000 | 46,000 | 59,000 |
| Food & Kindred Products | | | | | | |
| Program A | 5,245 | 5,295 | 5,790 | 5,000 | 4,300 | 3,800 |
| Program B | -- | -- | -- | 5,500 | 5,000 | 4,500 |
| Textile Mill Products | | | | | | |
| Program A | W 1/ | W | W | W | W | W |
| Program B | -- | -- | -- | W | W | W |
| Chemical & Allied Products | | | | | | |
| Program A | 3,246 | 4,373 | 5,876 | 7,300 | 10,000 | 13,000 |
| Program B | -- | -- | -- | 8,000 | 12,000 | 16,000 |
| Paper & Allied Products | | | | | | |
| Program A | 685 | 1,243 | 1,003 | 1,300 | 1,700 | 2,300 |
| Program B | -- | -- | -- | 1,400 | 2,000 | 2,700 |
| Petroleum Refining | | | | | | |
| Program A | 3,975 | 5,184 | 4,901 | 5,600 | 7,000 | 8,200 |
| Program B | -- | -- | -- | 6,100 | 8,100 | 9,700 |
| Primary Metals | | | | | | |
| Program A | W | W | W | W | W | W |
| Program B | -- | -- | -- | W | W | W |
| Other Manufacturing | | | | | | |
| Program A | 7,548 | 7,341 | 11,092 | 12,800 | 16,900 | 22,300 |
| Program B | -- | -- | -- | 14,000 | 20,000 | 26,000 |
| All Other | | | | | | |
| Program A | 87,391 | 132,072 | 190,486 | 201,000 | 238,000 | 285,000 |
| Program B | -- | -- | -- | 220,000 | 274,000 | 336,000 |

1/ W—Withheld to avoid disclosing company confidential information.

Table 82 - Gross Product Originating by Major Industries in WRPA 9

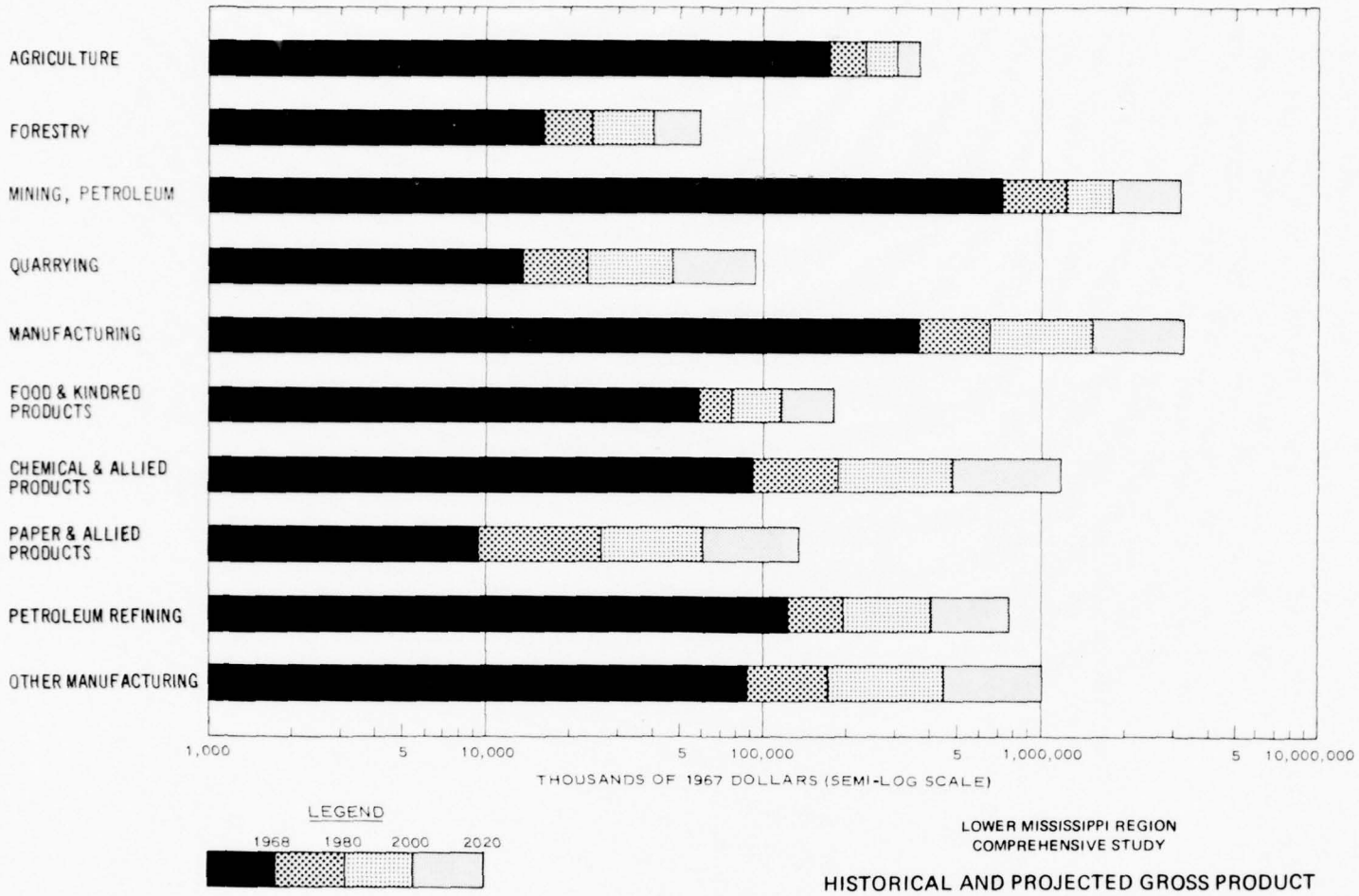
| Industry | Gross Product Originating in Indicated Years thousands of 1967 dollars | | | | |
|---|---|---|---|---|---|
| | 1967 | 1968 | 1980 | 2000 | 2020 |
| Agriculture 1/ | | | | | |
| Program A | -- | 173,745 2/ | 233,000 | 282,000 | 339,000 |
| Program B | -- | -- | 233,000 | 303,000 | 364,000 |
| Forestry 3/ | | | | | |
| Program A | -- | 16,200 2/ | 15,000 | 17,000 | 19,000 |
| Program B | -- | -- | 24,000 | 40,000 | 59,000 |
| Mining, Petroleum | | | | | |
| Program A | 688,704 | 730,026 | 1,123,000 | 1,563,000 | 2,762,000 |
| Program B | -- | -- | 1,231,000 | 1,808,000 | 3,257,000 |
| Quarrying | | | | | |
| Program A | 12,809 | 13,449 | 21,000 | 41,000 | 79,000 |
| Program B | -- | -- | 23,000 | 47,000 | 93,000 |
| Manufacturing | | | | | |
| Program A | 324,000 | 369,000 | 596,000 | 1,309,000 | 2,809,000 |
| Program B | -- | -- | 654,000 | 1,513,000 | 3,315,000 |
| Food & Kindred Products | | | | | |
| Program A | 56,296 | 58,548 | 69,000 | 101,000 | 153,000 |
| Program B | -- | -- | 76,000 | 117,000 | 181,000 |
| Textile Mill Products | | | | | |
| Program A | W 4/ | W | W | W | W |
| Program B | -- | -- | W | W | W |
| Chemical & Allied Products | | | | | |
| Program A | 83,324 | 91,656 | 169,000 | 417,000 | 998,000 |
| Program B | -- | -- | 185,000 | 483,000 | 1,177,000 |
| Paper & Allied Products | | | | | |
| Program A | 13,821 | 9,398 | 24,000 | 53,000 | 114,000 |
| Program B | -- | -- | 26,000 | 61,000 | 134,000 |
| Petroleum Refining | | | | | |
| Program A | 88,781 | 122,518 | 178,000 | 351,000 | 654,000 |
| Program B | -- | -- | 195,000 | 406,000 | 772,000 |
| Primary Metals | | | | | |
| Program A | W | W | W | W | W |
| Program B | -- | -- | W | W | W |
| Other Manufacturing | | | | | |
| Program A | 82,000 | 87,000 | 156,000 | 387,000 | 890,000 |
| Program B | -- | -- | 172,000 | 446,000 | 1,051,000 |

1/ Marketing receipts.
2/ 1970 data.
3/ Value at local point of delivery including stumpage, cutting, and hauling.
4/ W—Withheld to avoid disclosing company confidential information.

Table 83 - Index of Output by Major Industries in WRPA 9

| Industry | Index of Output for Indicated Years 1/ | | | | |
|---|---|---|---|---|---|
| | 1967 | 1968 | 1980 | 2000 | 2020 |
| Agriculture | | | | | |
| Program A | -- | 100 2/ | 129 | 156 | 179 |
| Program B | -- | -- | 129 | 168 | 192 |
| Forestry | | | | | |
| Program A | -- | 100 2/ | 91 | 107 | 118 |
| Program B | -- | -- | 150 | 245 | 365 |
| Mining, Petroleum | | | | | |
| Program A | 100 | 106 | 163 | 227 | 401 |
| Program B | -- | -- | 179 | 263 | 473 |
| Quarrying | | | | | |
| Program A | 100 | 105 | 163 | 317 | 618 |
| Program B | -- | -- | 179 | 367 | 729 |
| Manufacturing | | | | | |
| Program A | 100 | 114 | 184 | 404 | 867 |
| Program B | -- | -- | 202 | 467 | 1,023 |
| Food & Kindred Products | | | | | |
| Program A | 100 | 104 | 123 | 179 | 272 |
| Program B | -- | -- | 135 | 207 | 321 |
| Textile Mill Products | | | | | |
| Program A | -- | -- | -- | -- | -- |
| Program B | -- | -- | -- | -- | -- |
| Chemical & Allied Products | | | | | |
| Program A | 100 | 110 | 203 | 501 | 1,198 |
| Program B | -- | -- | 223 | 579 | 1,413 |
| Paper & Allied Products | | | | | |
| Program A | 100 | 68 | 174 | 380 | 822 |
| Program B | -- | -- | 190 | 439 | 969 |
| Petroleum Refining | | | | | |
| Program A | 100 | 138 | 200 | 395 | 737 |
| Program B | -- | -- | 219 | 457 | 869 |
| Primary Metals | | | | | |
| Program A | -- | -- | -- | -- | -- |
| Program B | -- | -- | -- | -- | -- |
| Other Manufacturing | | | | | |
| Program A | 100 | 106 | 190 | 472 | 1,085 |
| Program B | -- | -- | 210 | 544 | 1,282 |

1/ 1967 = 100.
2/ 1970 used as base.




LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

HISTORICAL AND PROJECTED GROSS PRODUCT ORIGINATING BY MAJOR INDUSTRIES

WRPA 9 PROGRAM B

FIGURE 22

geographical location, and road and rail connections has made WRPA 9 an attractive location for industrial firms. The extent and quality of these resources are attested to by some of the Nation's major chemical producers having developed a multimillion-dollar petrochemical complex around Lake Charles. Natural resources have also been of great importance to Lafayette, La., as it has become the area headquarters and service center for the oil and gas industry. Industrial growth has also been enhanced by the existence of the deepwater port of Lake Charles. In 1970, 27 percent of the total United States rice exports were handled through Lake Charles. Those materials necessary for fertilizer manufacture, such as phosphate, sodium nitrate, and ammonium sulfate, rank as the most important imports. The extent of industrial development in WRPA 9 is evidenced by the total value added by manufacturing, which amounted to $591.2 million in 1967, 21 percent of the State total.

## Agricultural Development

Agriculture is very important to the 14 parishes of WRPA 9. The flat lowlands and subtropical climate are conducive to the raising of rice, sugarcane, and soybeans. In 1970, there were an estimated 505,100 acres of rice, 105,000 acres of sugarcane, and 315,900 acres of soybeans harvested. The increase in soybean production between 1964 and 1970 was 628 percent. Rice, soybeans, sugarcane, hay, cotton, and corn accounted for 98 percent of the total harvested acreage. In addition to these crops, the area is also favorable for livestock and poultry production, which accounted for an estimated $30.4 million of the $173.7 million total value of all agricultural products sold in 1970. Table 84 summarizes agricultural production data for WRPA 9.

Farming activities in 1970 utilized 3.4 million acres in WRPA 9, 42.5 percent of the total land area. In 1949, only 36 percent of the WRPA 9 acreage was devoted to agricultural pursuits.

In 1949, there were 33,491 farms in the area, but by 1970 there were only 16,391, a decline of 51 percent. During the same period, land in farms increased from 3.2 to 3.4 million acres, an increase of 6 percent. Average farm size increased from 95 acres in 1949 to 207 acres in 1970.

In 1970, farm marketing receipts totaled $173.7 million. Field crops accounted for 82 percent of the total; livestock and livestock products represented 18 percent. Total gross farm income was $202.0 million, realized net farm income approximately $60.6 million, and derived net income per farm, $3,698.

Table 84 - Agricultural Production (Crops and Livestock) in WRPA 9

| Commodity | Unit of Measurement | Data for Indicated Years 1959 | 1970 | 1980 | 2000 | 2020 |
|---|---|---|---|---|---|---|
| Cotton | Bales | | | | | |
| Program A 1/ | | 60,825 | 69,891 | 40,000 | 44,000 | 47,000 |
| Program B 1/ | | -- | -- | 40,000 | 47,000 | 51,000 |
| Corn | Bushels | | | | | |
| Program A | | 2,594,403 | 1,520,000 | 841,000 | 1,162,000 | 1,390,000 |
| Program B | | -- | -- | 841,000 | 1,249,000 | 1,493,000 |
| Sorghum | Bushels | | | | | |
| Program A | | 11,544 | 57,000 | 112,000 | 143,000 | 199,000 |
| Program B | | -- | -- | 112,000 | 154,000 | 213,000 |
| Oats | Bushels | | | | | |
| Program A | | 197,830 | 200,000 | 299,000 | 309,000 | 320,000 |
| Program B | | -- | -- | 299,000 | 332,000 | 344,000 |
| Rice | Bushels | | | | | |
| Program A | | 29,206,483 | 42,937,155 | 42,699,000 | 50,352,000 | 59,918,000 |
| Program B | | -- | -- | 42,699,000 | 54,090,000 | 64,345,000 |
| Irish Potatoes | Bushels | | | | | |
| Program A | | 49,545 | 53,900 | 80,000 | 104,000 | 135,000 |
| Program B | | -- | -- | 80,000 | 112,000 | 145,000 |
| Sweet Potatoes | Bushels | | | | | |
| Program A | | 3,601,731 | 1,320,000 | 770,000 | 798,000 | 1,001,000 |
| Program B | | -- | -- | 770,000 | 858,000 | 1,075,000 |
| Tobacco | Pounds | | | | | |
| Program A | | 0 | 0 | 0 | 0 | 0 |
| Program B | | -- | -- | 0 | 0 | 0 |
| Sugarcane | Tons | | | | | |
| Program A | | 1,950,146 | 2,835,000 | 3,161,000 | 3,676,000 | 4,126,000 |
| Program B | | -- | -- | 3,161,000 | 3,949,000 | 4,431,000 |
| Wheat | Bushels | | | | | |
| Program A | | 16,406 | 15,400 | 56,000 | 67,000 | 74,000 |
| Program B | | -- | -- | 56,000 | 72,000 | 80,000 |
| Soybeans | Bushels | | | | | |
| Program A | | 282,954 | 8,213,400 | 17,638,000 | 21,737,000 | 25,482,000 |
| Program B | | -- | -- | 17,638,000 | 23,351,000 | 27,365,000 |

1/ Program A data incorporates 1970 production estimates; Program B data reflect the projected national growth rate shown in Table II-3, Selected Agricultural Products, pages II-18 through II-22, Volume 1, Economic Activity in the United States by Water Resource Regions and Subareas, Historical and Projected, 1929-2020, United States Water Resources Council, April 1971.

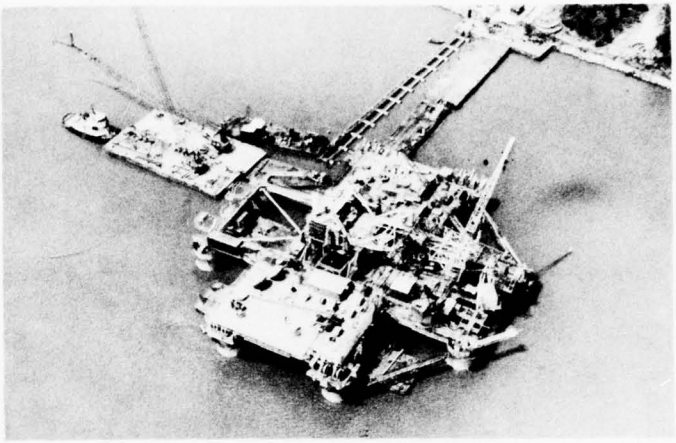
Table 84 - Agricultural Production (Crops and Livestock) in WRPA 9 (Con.)

| Commodity | Unit of Measurement | Data for Indicated Years 1959 | 1970 | 1980 | 2000 | 2020 |
|---|---|---|---|---|---|---|
| Forest Products 2/ | Thousands of Cubic Feet | | | | | |
| Program A | | -- | 68,900 | 63,000 | 74,000 | 81,000 |
| Program B | | -- | -- | 103,000 | 169,000 | 251,000 |
| Hay | Tons | | | | | |
| Program A | | 139,950 | 139,680 | 199,000 | 246,000 | 304,000 |
| Program B | | -- | -- | 199,000 | 264,000 | 326,000 |
| Gross Value of Crops | Thousands of 1967 Dollars | | | | | |
| Program A | | 90,000 | 143,000 | 187,000 | 221,000 | 259,000 |
| Program B | | -- | -- | 187,000 | 237,000 | 278,000 |
| | | Livestock Thousands 3/ | | | | |
| Beef | Pounds | | | | | |
| Program A | | -- | 101,846 | 129,742 | 174,640 | 234,538 |
| Program B | | -- | -- | 129,742 | 187,605 | 251,866 |
| Pork | Pounds | | | | | |
| Program A | | -- | 13,187 | 15,012 | 19,608 | 25,453 |
| Program B | | -- | -- | 15,012 | 21,064 | 27,333 |
| Lamb | Pounds | | | | | |
| Program A | | -- | 544 | 419 | 492 | 605 |
| Program B | | -- | -- | 419 | 529 | 650 |
| Chickens | Pounds | | | | | |
| Program A | | -- | 4,199 | 5,839 | 8,153 | 10,946 |
| Program B | | -- | -- | 5,839 | 8,758 | 11,755 |
| Turkeys | Pounds | | | | | |
| Program A | | -- | 99 | 132 | 186 | 251 |
| Program B | | -- | -- | 132 | 200 | 270 |
| Eggs | Dozen | | | | | |
| Program A | | -- | 14,028 | 15,394 | 19,706 | 24,961 |
| Program B | | -- | -- | 15,394 | 21,169 | 26,805 |
| Milk | Pounds | | | | | |
| Program A | | -- | 162,882 | 149,543 | 184,574 | 225,414 |
| Program B | | -- | -- | 149,543 | 198,277 | 242,068 |
| Total Value of Livestock | 1967 Dollars | | | | | |
| Program A | | 27,407 | 30,405 | 45,992 | 60,515 | 79,286 |
| Program B | | -- | -- | 45,992 | 66,076 | 86,451 |

2/ Includes sawlogs, veneer logs, pulpwood, poles, etc., cut for industrial or consumer uses. (U. S. Forest Service.)
3/ Net liveweight production.



Rice fields south of Lafayette, La.



Offshore drilling rig at Belle Chasse, La.



Aerial view of Gulf Intercoastal Waterway



Lake Charles Harbor and vicinity

## HISTORICAL TRENDS

### Population

The population of WRPA 9 in 1970 was 748,433, an increase of 62 percent from 1940. Much of the growth has centered around the Lake Charles and the Lafayette SMSA's. The population of each of these metropolitan areas has increased about 150 percent since 1940. In 1970, the populations of the Lake Charles and Lafayette SMSA's were 145,415 and 109,716, respectively. Urban population in WRPA 9 increased from 33 percent of the total in 1940 to 57 percent in 1970.

### Employment

Total employment in WRPA 9 in 1968 was 253,643, representing an increase of 86 percent from 1940; the national increase was 73 percent. Industries showing the greatest growth were government, utilities, chemicals, and professional services. Other industries showed lower rates of growth or remained stable except for agriculture, forestry and fisheries, lumber and furniture, and railroad transportation, all of which registered negative growth trends.

### Personal and Per Capita Income

Both personal and per capita incomes increased consistently during the period between 1940 and 1968. Total personal income in 1968 was $1.8 billion, an increase of 537 percent, and per capita income, which was $2,346 in 1968, increased 295 percent. However, per capita income is still 29 percent below the national average.

## ECONOMIC PROBLEMS

WRPA 9 contains ten parishes with adverse economic conditions severe enough to qualify them, as of January 1972, for Federal assistance under the Public Works and Economic Development Act of 1965. Qualification for assistance under the act is generally based on persistently high unemployment rates and/or on low median family incomes. Areas qualified for public works grants and loans include Acadia, Allen, Calcasieu, Evangeline, St. Landry, St. Martin, Vermilion, and Vernon Parishes. Beauregard and Jefferson Davis Parishes qualify for public works grants only. The occurrence of high unemployment rates has been the major problem plaguing these areas; however, an extremely low median family income is the major problem in Evangeline, St. Landry, St. Martin, and Vernon Parishes. Other parishes have a median family income lower than the national median, but in the latter four parishes the median family income is less than 50 percent of the national figure.

### Low Income Levels

In 1967, Vernon Parish was the only parish in WRPA 9 that did not have a per capita income lower than the national rate of $3,159. This was due in large part to the high activity level at the Fort Polk Army installation. In six of the other parishes, per capita income was between $2,000 and $3,000; in the remaining seven parishes, the figure fell below the $2,000 level. The severity of the low income problem was evidenced in St. Martin, Evangeline, St. Landry, and Beauregard Parishes, which had per capita incomes of $1,230, $1,448, $1,506, and $1,534, respectively.

### Unemployment and Underemployment

During the period 1965-1971, the national rate of unemployment increased from 4.5 to 5.9 percent. In WRPA 9, only Cameron, Lafayette, Jefferson Davis, and St. Mary Parishes had unemployment rates lower than the national average in 1971. Exceptionally high rates ranging from 8.4 to 11.4 percent were experienced in Allen, Calcasieu, St. Martin, St. Landry, Acadia, and Evangeline Parishes, with the remaining parishes having unemployment rates between 6.0 and 7.6 percent.

### Population Loss

Cameron, St. Martin, Vermilion, and Vernon Parishes experienced slight population losses from 1940 to 1950. Vernon Parish was the only one to continue this downward trend from 1950 to 1960. Between 1960 and 1970, Calcasieu, Jefferson Davis, and St. Landry Parishes

experienced slight population losses; however, the population in Vernon Parish almost tripled with the reactivation of Ft. Polk.

## PROGRAM A, NATIONAL INCOME

BEA projections indicate continued growth in WRPA 9 from 1970 to 2020. Population is expected to increase by 33 percent, total employment by 42 percent, and total personal income by 714 percent. Although projected to increase faster than the national average, per capita income is expected to be only 76 percent of the national average by 2020. Per worker earnings are also expected to continue below the national average and reach only 86 percent of the national average by 2020.

The employment projections for the manufacturing and for the agriculture and forestry and fisheries sectors follow national trends, with manufacturing employment increasing steadily during the next five decades and agriculture employment declining until 2000, at which time it will remain constant to 2020. Employment in the mining industry in WRPA 9 is expected to decline slowly. Chemical and allied products and paper and allied products are projected to be the best growth industries in the manufacturing sector; their employment rates are expected to more than double by 2020.

## PROGRAM B, REGIONAL DEVELOPMENT

Under Program B, it is projected that the population of WRPA 9 will increase to 1.1 million in 2020, a 49 percent increase over 1968; under Program A, a 32 percent increase is anticipated.

Between 1968 and 2020, the employment rate under Program B is projected to increase by 68 percent, as compared with 42 percent anticipated under Program A. All areas of employment except employment in agriculture will show a positive gain under Program B. Agricultural employment is expected to decrease by 38 percent under Program B, whereas the decrease is expected to be 47 percent under Program A. Overall, the Program B total employment increase averages 18 percent above the Program A estimates for 2020. However, the increases between 1968 and 2020 vary by economic sectors and by industrial classifications. While total employment increases 26 percent more under Program B than under Program A from 1968 to 2020, both the chemical and allied products and the paper and allied products sectors have gains of 41 percent. The increase is lowest in the mining industry, where a difference of only 17 percent is evidenced during this period between Program B and Program A projections.

Per capita income under Program B is projected to increase by 387 percent between 1968 and 2020; under Program A it is projected to increase by 364 percent. This is due to the fact that per capita income is a function of employment, per worker earnings, and total population of an area. This is still 20 percent below the projected national average. A greater increase is seen in personal income. Under Program B, personal income is projected to increase by 724 percent during this period, and under Program A, it is projected to increase by 514 percent. While per worker earnings show no change in the two Programs, total earnings increase from the 488 percent projected in Program A to 594 percent in Program B during the 1968-2020 interval.

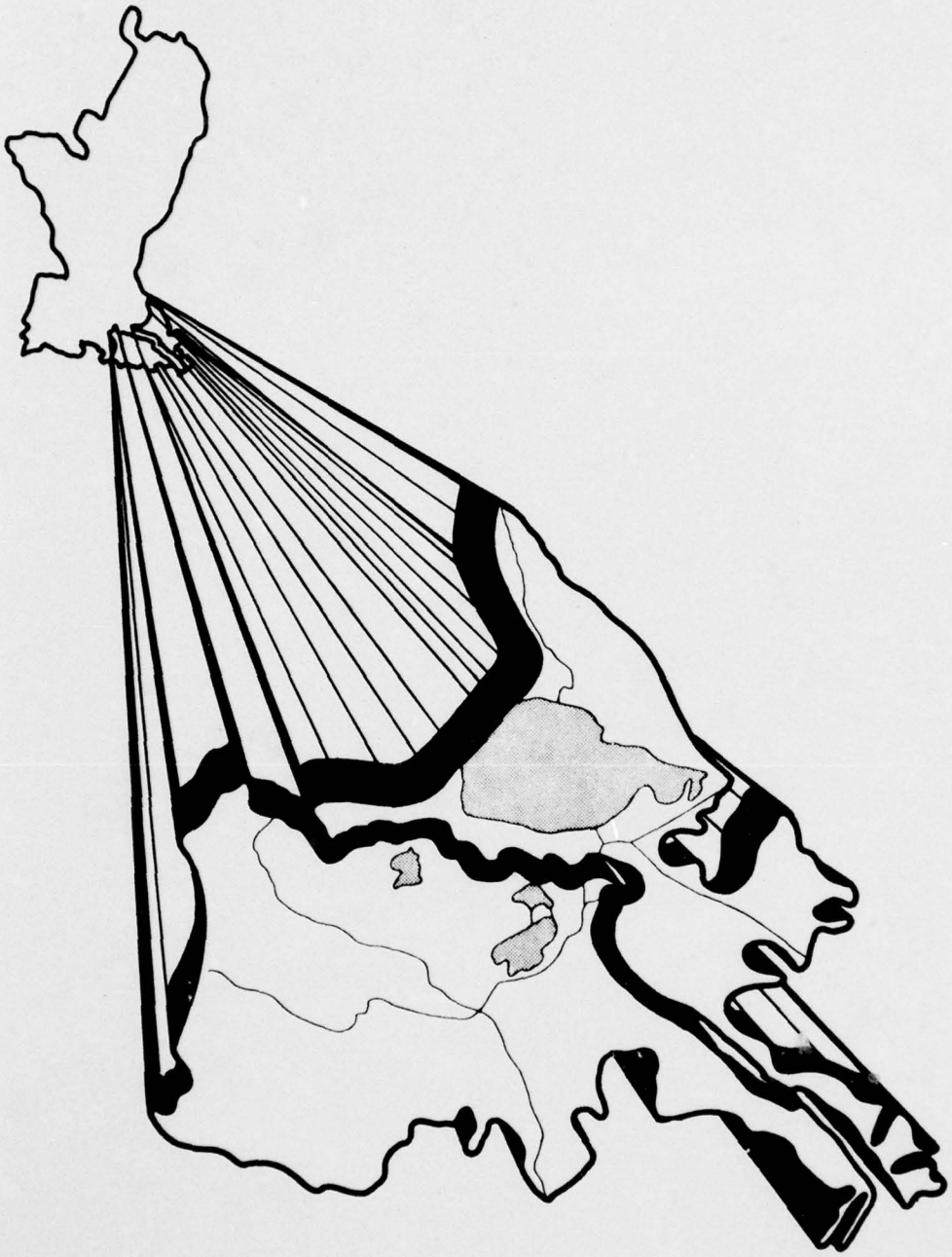
## OUTLOOK FOR THE FUTURE

The SMSA's of Lake Charles and Lafayette are expected to continue as focal points of the economy in WRPA 9; however, growth is expected to be less than regionally or nationally. During the projected period, 1968 to 2020, the WRPA's share of total U. S. population is expected to decline from 0.37 percent to 0.26 percent.

During the same time frame, the area's share of personal income is expected to decline from 0.25 percent of the national total to 0.20 percent. This will be a lesser reduction than that anticipated in population and, as a consequence, per capita income will increase from 69 to 78 percent of the national average.

The expected slow economic progress in WRPA 9 is explained by the growth characteristics of three of the area's primary economic sectors, Government (mainly military), mining, and agriculture. Fort Polk, a major army basic training center, accounts for a large portion of the total employment. Projections for this sector indicate a consistent level of employment to the year 2020, thus presaging its slowly diminishing role as a source of income. Earnings from petroleum mining are projected to increase from 5.7 percent of the national total in 1969 to 7.7 percent in 2020. However, traditionally this has been a slow-growth industry, so petroleum mining earnings are projected to decline from 24.1 percent of total basic earnings in 1969 to about 15 percent in 2020. The area's share of national agricultural earnings is projected to remain at about 0.6 percent.

In summation, projections indicate that WRPA 9, which has been dominated by industries with limited potential for spurring regional growth and with a paucity of alternative growth-inducing basic industries, appears destined to develop more slowly than the Nation as a whole.



# WRPA 10

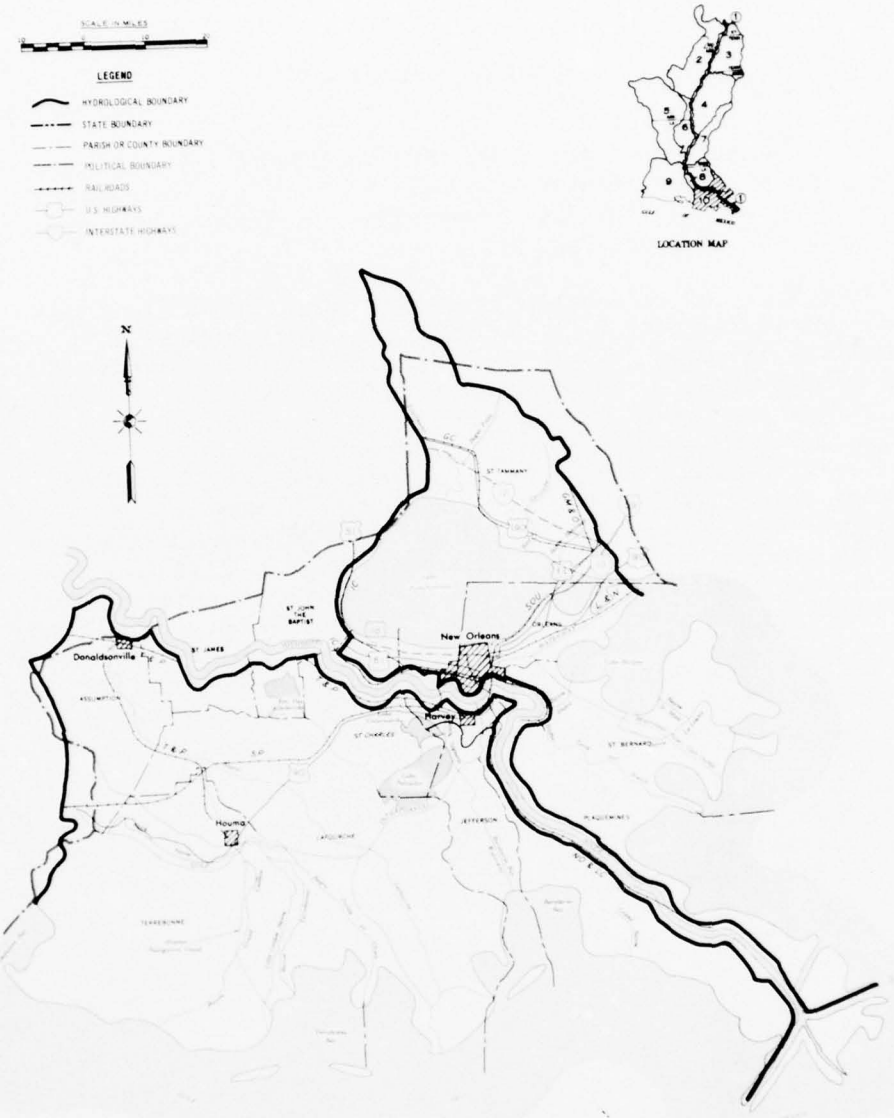
# WRPA 10, NEW ORLEANS

## PHYSICAL DESCRIPTION

Lying in southeast Louisiana, WRPA 10 (figure 23) comprises the southeastern extremity of the alluvial valley of the Mississippi River. Included within it is the New Orleans SMSA (Jefferson, Orleans, St. Bernard, and St. Tammany Parishes).

Topography for this region generally falls into three types: (1) the alluvial ridges lying adjacent to the Mississippi River and its abandoned distributaries; (2) the extensive marsh and swamplands; and (3) the higher rolling lands situated north of Lake Pontchartrain. By far, the largest portion of WRPA 10 comprises marsh and swamp areas. The flat treeless plains of the marshes consist of close growths of sedge, marsh grasses, and rushes, and the swamps are most frequently characterized by woodland cover. Thousands of lakes and lagoons dot these low-lying lands. Development has burgeoned on the alluvial ridges which were raised by the historical overflows that deposited sediments along the banks of the Mississippi River and its distributaries. Along the Mississippi River, these alluvial ridges extend for a distance of up to 5 miles from each bank and vary in elevation from near sea level to several feet above sea level. That portion of the area situated north of Lake Pontchartrain consists of clay hills and uplands which become flatlands along the shore of the lake.

Influenced by its latitude and proximity to the Gulf, WRPA 10 has a warm, humid, subtropical climate with mild winters and hot summers. Average monthly temperatures range from 55°F in January to 83°F in July. Normal average annual precipitation amounts to about 60 inches.




LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

**WATER RESOURCE PLANNING**
**AREA 10**

FIGURE 23

## ECONOMIC DESCRIPTION

The economy of WRPA 10 is based upon an abundance of natural resources of uncommonly broad scope. An economic profile summary for WRPA 10 is presented in table 85. The area is rich in commercially important minerals, fertile lands for agricultural production, and timberlands. Generously endowed with fish and wildlife resources of great diversity, it offers a wide variety of opportunities for outdoor recreation as well as for commercial harvests. This area has an extensive system of navigable waterways, is strategically located as a hub for

Table 85 - Economic Profile Summary for WRPA 10

| Parameter | Data for Indicated Years | | | | | |
|---|---|---|---|---|---|---|
| | 1950 | 1959 | 1968 | 1980 | 2000 | 2020 |
| Population (1 July) 1/ | | | | | | |
| Program A | 877,394 | 1,104,954 | 1,283,302 | 1,478,000 | 1,864,000 | 2,386,000 |
| Program B | -- | -- | -- | 1,595,000 | 2,079,000 | 2,707,000 |
| Personal Income 2/ | | | | | | |
| Program A | 1,695,503 | 2,508,562 | 3,915,016 | 6,377,000 | 14,159,000 | 31,467,000 |
| Program B | -- | -- | -- | 6,991,000 | 16,376,000 | 37,113,000 |
| Per Capita 2/ | | | | | | |
| Program A | 1,932 | 2,270 | 3,051 | 4,314 | 7,594 | 13,190 |
| Program B | -- | -- | -- | 4,383 | 7,878 | 13,711 |
| Earnings 2/ | | | | | | |
| Program A | 1,348,831 | 2,016,300 | 3,124,945 | 5,069,000 | 11,014,000 | 23,949,000 |
| Program B | -- | -- | -- | 5,557,000 | 12,738,000 | 28,247,000 |
| Per Worker 2/ | | | | | | |
| Program A | 4,303 | 5,338 | 6,786 | 9,416 | 15,712 | 26,088 |
| Program B | -- | -- | -- | 9,416 | 15,712 | 26,088 |
| Employment | | | | | | |
| Total, Program A | 313,467 | 377,696 | 460,494 | 538,000 | 701,000 | 918,000 |
| Total, Program B | -- | -- | -- | 590,000 | 811,000 | 1,083,000 |
| Gross Manufacturing Product 2/ | | | | | | |
| Total, Program A | -- | -- | 766,103 | 1,226,000 | 2,736,000 | 6,019,000 |
| Total, Program B | -- | -- | -- | 1,343,000 | 3,167,000 | 7,099,000 |
| Gross Farm Marketing Receipts 2/ | | | | | | |
| Total, Program A | -- | -- | 36,465 3/ | 53,000 | 63,000 | 72,000 |
| Total, Program B | -- | -- | -- | 53,000 | 69,000 | 81,000 |

1/ U. S. Bureau of Census figures show the 1970 population of WRPA 10 as 1,308,774.
2/ Personal income, total earnings, gross manufacturing product, and gross farm marketing receipt data are given in thousands of 1967 dollars; per capita income and per worker earnings are given in 1967 dollars.
3/ 1970 data.

foreign and domestic trade, and possesses a cultural and historical heritage which ranks with the most significant in the United States.

## Natural Resources

WRPA 10 is prolifically endowed in mineral resources. The total value of mineral production in 1969 was approximately $2.6 billion, or about 56 percent of the Louisiana total. Most important of the minerals in the area are oil and gas, salt, sulfur, sand and gravel, and shell. Oil and gas are produced from many fields scattered throughout the area, particularly in the marshes and offshore areas. Sand and gravel deposits suitable for commercial purposes are particularly plentiful in the northeastern portion of WRPA 10, while salt and sulfur deposits are mainly located in the southern portion of the area. Clam and oyster shells are found in the numerous lakebeds and coastal bottoms.

Found in the coastal marshes of WRPA 10 are some of the most valuable fur-producing areas in the Nation. Nutria, muskrat, and raccoon rank first, second, and third in number of furs taken. These marshes also serve as wintering grounds for many of the millions of waterfowl using the Mississippi Flyway. Numerous wildlife refuge and management areas which are in operation provide for wildlife protection. Many streams, inshore lakes, bays, and the Gulf of Mexico comprise an extensive fishery in both the freshwater and euryhaline species. Commercially, this area provides a valuable fishery resource consisting of shrimp, oysters, crabs, crayfish, finfish, and menhaden. In the offshore waters, the menhaden fishery is one of the Nation's largest, and in shrimp and oyster production, Louisiana is among the Nation's leaders.

Of the total land area of WRPA 10 (4.2 million acres), 1.1 million acres (26.2 percent) are classified as commercial forests. Timber stands are located throughout the swamplands as well as in the hilly areas north of Lake Pontchartrain. Hardwoods (ash, cottonwood, elm, gum, oak, and cypress) are the most common tree types. However, in the rolling lands of St. Tammany Parish, the most important tree type is pine, predominantly the slash species.

Water is an outstanding characteristic of the area, which includes the Mississippi River and innumerable smaller rivers and bayous in addition to a myriad of lakes, bays, and lagoons. Supplies of surface water and groundwater of good quality are available in most parts of the area. While available supplies are generally adequate for municipal and industrial needs, deficiencies exist in some areas along the Gulf where supplies are affected by salt water intrusion and in isolated local areas which are subject to pollution from waste disposal. For waterborne commerce, an extensive network of natural and artificial

waterways, with connections to Gulf Coast seaports and to the industrial heartland of the Nation, serves the entire area.

## Industrial Development

Earnings and employment by major industries in WRPA 10 are presented in tables 86 and 87, respectively. Gross product originating and an index of output by major industries are presented in tables 88 and 89, respectively. Figure 24 is a chart showing historical and projected gross product originating by major industries in WRPA 10.

Due to the presence of varied natural resources and its location on crossroads of internal and foreign commerce, WRPA 10 has experienced remarkable industrial development. Since 1946, investment in industry along the banks of the Mississippi River in WRPA 10 has totaled $1.5 billion, $0.5 billion between 1946 and 1961 and $1.0 billion between 1961 and 1971. A vast complex of petrochemical plants has been developed in recent years along the Mississippi River. Other industries have grown up around such native resources as sulfur, salt, and sugar, and imported products such as bauxite, gypsum, and coffee have also contributed to industrial development. Rich timber resources provide products ranging from paper to creosote-treated poles. Seafood and fish processing have developed into prominent industries. The growth pattern of the construction industry, a leading industry in WRPA 10, is closely related to the overall growth patterns throughout this area. The extent of industrial development is evidenced by the fact that the total value added by manufacturing in 1967 exceeded $1.1 billion, an increase of $400 million over 1963. Because of its favorable geographical location, abundant natural resources, extensive water transportation facilities, and plentiful recreational opportunities, WRPA 10 will continue to be attractive for further urbanization and industrialization.

## Agricultural Development

Following recent national trends of relatively decreasing economic importance, agriculture plays a subordinate role in WRPA 10. Table 90 presents a summary of agricultural production data for WRPA 10. In 1970, there were approximately 775,000 acres (14 percent of the area) devoted to agricultural activity. In 1949, 15 percent of the land in WRPA 10 was devoted to agriculture.

In 1949, there were 5,638 farms in the area; by 1970, there were only 2,613, a decline of 54 percent. During the same period, land in farms declined from 885,000 to 775,000 acres, a decline of 12 percent. Average farm size increased from 157 acres in 1949 to 297 acres in 1970.

Table 86 - Earnings by Major Industries in WRPA 10

| Industry | Earnings for Indicated Years, thousands of 1967 dollars | | | | | |
|---|---|---|---|---|---|---|
| | 1950 | 1959 | 1968 | 1980 | 2020 | 2020 |
| Total, Program A | 1,348,831 | 2,016,300 | 3,124,945 | 5,069,000 | 11,014,000 | 23,949,000 |
| Total, Program B | -- | -- | -- | 5,557,000 | 12,738,000 | 28,246,000 |
| Per Worker 1/ | | | | | | |
| Program A | 4,303 | 5,338 | 6,786 | 9,416 | 15,712 | 26,088 |
| Program B | -- | -- | -- | 9,416 | 15,712 | 26,088 |
| Agriculture | | | | | | |
| Program A | 30,193 | 21,505 | 23,690 | 24,000 | 31,000 | 54,000 |
| Program B | -- | -- | -- | 26,000 | 35,000 | 64,000 |
| Forestry & Fisheries | | | | | | |
| Program A | 10,006 | 5,850 | 7,840 | 9,000 | 18,000 | 31,000 |
| Program B | -- | -- | -- | 10,000 | 20,000 | 37,000 |
| Mining, Petroleum | | | | | | |
| Program A | 27,982 | 160,891 | 215,287 | 308,000 | 459,000 | 623,000 |
| Program B | -- | -- | -- | 338,000 | 531,000 | 735,000 |
| Manufacturing | | | | | | |
| Program A | 231,885 | 333,207 | 553,613 | 862,000 | 1,863,000 | 3,985,000 |
| Program B | -- | -- | -- | 945,000 | 2,154,000 | 4,700,000 |
| Food & Kindred Products | | | | | | |
| Program A | 72,407 | 82,801 | 104,848 | 118,000 | 162,000 | 243,000 |
| Program B | -- | -- | -- | 129,000 | 187,000 | 286,000 |
| Textile Mill Products | | | | | | |
| Program A | 6,132 | 2,533 | 4,421 | 5,200 | 8,800 | 17,000 |
| Program B | -- | -- | -- | 5,700 | 10,000 | 20,000 |
| Chemical & Allied Products | | | | | | |
| Program A | 8,704 | 28,959 | 51,042 | 92,000 | 246,000 | 589,000 |
| Program B | -- | -- | -- | 101,000 | 284,000 | 695,000 |
| Paper & Allied Products | | | | | | |
| Program A | 13,679 | 12,158 | 16,331 | 24,000 | 51,000 | 107,000 |
| Program B | -- | -- | -- | 27,000 | 59,000 | 126,000 |
| Petroleum Refining | | | | | | |
| Program A | 15,366 | 17,789 | -- | 39,000 | 66,000 | 113,000 |
| Program B | -- | -- | -- | 43,000 | 76,000 | 133,000 |
| Primary Metals | | | | | | |
| Program A | 2,101 | 21,888 | 27,244 | 36,000 | 56,000 | 88,000 |
| Program B | -- | -- | -- | 39,000 | 64,000 | 103,000 |
| Other Manufacturing | | | | | | |
| Program A | 113,496 | 167,079 | 321,356 | 548,000 | 1,273,000 | 2,828,000 |
| Program B | -- | -- | -- | 600,000 | 1,474,000 | 3,337,000 |
| All Other | | | | | | |
| Program A | 1,048,765 | 1,494,847 | 2,324,515 | 3,866,000 | 8,643,000 | 19,256,000 |
| Program B | -- | -- | -- | 4,238,000 | 9,998,000 | 22,710,000 |

1/ Per worker earnings are given in 1967 dollars.

Table 87 - Employment by Major Industries in WRPA 10

| Industry | Number of Persons Employed in Indicated Years | | | | |
|---|---|---|---|---|---|
| | 1950 | 1960 | 1980 | 2000 | 2020 |
| Total, Program A | 313,467 | 377,696 | 538,000 | 701,000 | 918,000 |
| Total, Program B | -- | -- | 590,000 | 811,000 | 1,083,000 |
| Agriculture | | | | | |
| Program A | 12,670 | 6,962 | 3,500 | 2,400 | 2,300 |
| Program B | -- | -- | 3,500 | 2,600 | 2,500 |
| Forestry & Fisheries | | | | | |
| Program A | 5,136 | 2,852 | 3,800 | 4,100 | 4,200 |
| Program B | -- | -- | 4,200 | 4,700 | 5,000 |
| Mining, Petroleum | | | | | |
| Program A | 6,348 | 14,049 | 15,000 | 15,000 | 15,000 |
| Program B | -- | -- | 16,000 | 17,000 | 18,000 |
| Manufacturing | | | | | |
| Program A | 49,631 | 63,890 | 88,000 | 114,000 | 147,000 |
| Program B | -- | -- | 96,000 | 132,000 | 173,000 |
| Food & Kindred Products | | | | | |
| Program A | 15,565 | 18,390 | 16,000 | 14,000 | 13,000 |
| Program B | -- | -- | 18,000 | 17,000 | 15,000 |
| Textile Mill Products | | | | | |
| Program A | 1,833 | 688 | 500 | 400 | 400 |
| Program B | -- | -- | 550 | 460 | 470 |
| Chemical & Allied Products | | | | | |
| Program A | 2,041 | 4,574 | 7,300 | 12,600 | 19,000 |
| Program B | -- | -- | 8,000 | 15,000 | 22,000 |
| Paper & Allied Products | | | | | |
| Program A | 3,279 | 3,378 | 2,400 | 3,000 | 3,800 |
| Program B | -- | -- | 2,600 | 3,500 | 4,400 |
| Petroleum Refining | | | | | |
| Program A | 2,784 | 5,081 | 3,600 | 3,800 | 3,900 |
| Program B | -- | -- | 4,000 | 4,400 | 4,600 |
| Primary Metals | | | | | |
| Program A | 567 | 3,154 | 3,500 | 3,500 | 3,400 |
| Program B | -- | -- | 3,800 | 4,000 | 4,100 |
| Other Manufacturing | | | | | |
| Program A | 23,562 | 28,625 | 55,000 | 77,000 | 104,000 |
| Program B | -- | -- | 59,000 | 88,000 | 122,000 |
| All Other | | | | | |
| Program A | 239,682 | 289,943 | 428,000 | 566,000 | 750,000 |
| Program B | -- | -- | 470,000 | 655,000 | 885,000 |

Table 88 - Gross Product Originating by Major Industries in WRPA 10

| Industry | Gross Product Originating in Indicated Years thousands of 1967 dollars | | | | |
|---|---|---|---|---|---|
| | 1967 | 1968 | 1980 | 2000 | 2020 |
| Agriculture 1/ | | | | | |
| Program A | -- | 36,465 2/ | 53,000 | 63,000 | 72,000 |
| Program B | -- | -- | 53,000 | 69,000 | 81,000 |
| Forestry 3/ | | | | | |
| Program A | -- | 3,200 2/ | 3,800 | 4,800 | 6,300 |
| Program B | -- | -- | 7,000 | 12,000 | 18,000 |
| Mining, Petroleum | | | | | |
| Program A | 1,061,008 | 1,124,668 | 1,698,000 | 2,324,000 | 4,053,000 |
| Program B | -- | -- | 1,861,000 | 2,687,000 | 4,780,000 |
| Quarrying | | | | | |
| Program A | W 4/ | W | W | W | W |
| Program B | -- | -- | W | W | W |
| Manufacturing | | | | | |
| Program A | 729,622 | 766,103 | 1,226,000 | 2,736,000 | 6,019,000 |
| Program B | -- | -- | 1,343,000 | 3,167,000 | 7,099,000 |
| Food & Kindred Products | | | | | |
| Program A | 179,209 | 179,209 | 235,000 | 355,000 | 556,000 |
| Program B | -- | -- | 258,000 | 410,000 | 656,000 |
| Textile Mill Products | | | | | |
| Program A | 4,520 | 3,752 | 5,200 | 6,300 | 8,400 |
| Program B | -- | -- | 5,600 | 7,300 | 9,900 |
| Chemical & Allied Products | | | | | |
| Program A | 99,829 | 117,798 | 228,000 | 676,000 | 1,768,000 |
| Program B | -- | -- | 250,000 | 782,000 | 2,085,000 |
| Paper & Allied Products | | | | | |
| Program A | 26,336 | 28,443 | 42,000 | 88,000 | 186,000 |
| Program B | -- | -- | 46,000 | 102,000 | 219,000 |
| Petroleum Refining | | | | | |
| Program A | 47,191 | 64,180 | 92,000 | 167,000 | 294,000 |
| Program B | -- | -- | 101,000 | 193,000 | 347,000 |
| Primary Metals | | | | | |
| Program A | 41,849 | 40,594 | 55,000 | 86,000 | 135,000 |
| Program B | -- | -- | 60,000 | 99,000 | 159,000 |
| Other Manufacturing | | | | | |
| Program A | 330,688 | 332,127 | 569,000 | 1,358,000 | 3,072,000 |
| Program B | -- | -- | 622,000 | 1,574,000 | 3,623,000 |

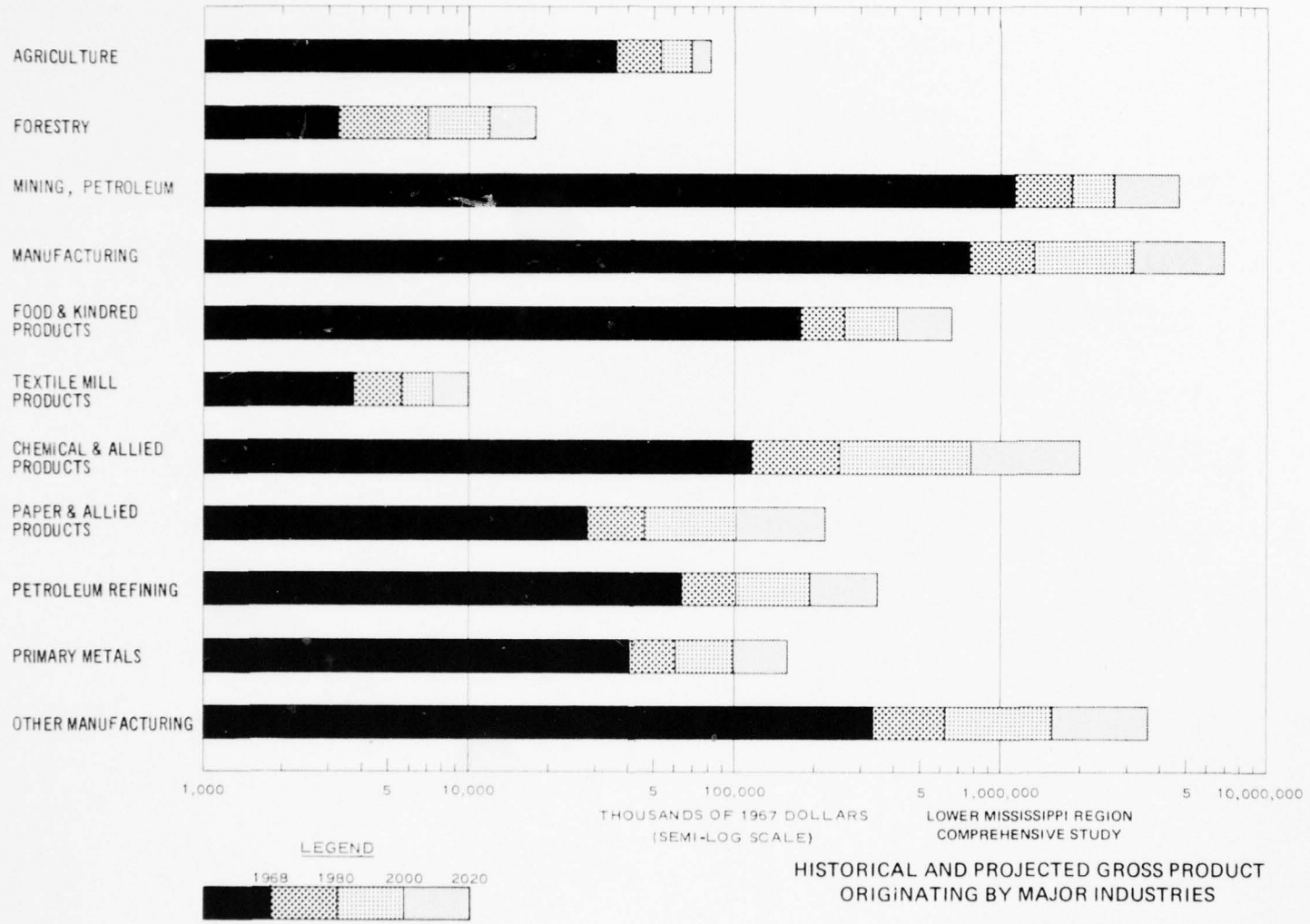
1/ Marketing receipts.
2/ 1970 data.
3/ Value at local point of delivery including stumpage, cutting, and hauling.
4/ W—Withheld to avoid disclosing company confidential information.

Table 89 - Index of Output by Major Industries in WRPA 10

| Industry | Index of Output for Indicated Years 1/ | | | | |
|---|---|---|---|---|---|
| | 1967 | 1968 | 1980 | 2000 | 2020 |
| Agriculture | | | | | |
| Program A | -- | 100 2/ | 145 | 172 | 197 |
| Program B | -- | -- | 145 | 185 | 212 |
| Forestry | | | | | |
| Program A | -- | 100 2/ | 119 | 150 | 197 |
| Program B | -- | -- | 219 | 378 | 566 |
| Mining, Petroleum | | | | | |
| Program A | 100 | 106 | 160 | 219 | 382 |
| Program B | -- | -- | 175 | 255 | 451 |
| Quarrying | | | | | |
| Program A | 100 | 110 | 163 | 316 | 622 |
| Program B | -- | -- | 179 | 365 | 734 |
| Manufacturing | | | | | |
| Program A | 100 | 105 | 168 | 375 | 825 |
| Program B | -- | -- | 184 | 435 | 973 |
| Food & Kindred Products | | | | | |
| Program A | 100 | 100 | 131 | 198 | 310 |
| Program B | -- | -- | 144 | 229 | 366 |
| Textile Mill Products | | | | | |
| Program A | 100 | 83 | 114 | 140 | 185 |
| Program B | -- | -- | 125 | 162 | 218 |
| Chemical & Allied Products | | | | | |
| Program A | 100 | 118 | 228 | 677 | 1,771 |
| Program B | -- | -- | 250 | 783 | 2,089 |
| Paper & Allied Products | | | | | |
| Program A | 100 | 108 | 160 | 335 | 706 |
| Program B | -- | -- | 175 | 387 | 833 |
| Petroleum Refining | | | | | |
| Program A | 100 | 136 | 195 | 353 | 624 |
| Program B | -- | -- | 214 | 408 | 736 |
| Primary Metals | | | | | |
| Program A | 100 | 97 | 131 | 205 | 322 |
| Program B | -- | -- | 144 | 237 | 380 |
| Other Manufacturing | | | | | |
| Program A | -- | 100 | 172 | 411 | 929 |
| Program B | -- | -- | 188 | 476 | 1,096 |

1/ 1967 = 100.
2/ 1970 = 100.

FIGURE 24




HISTORICAL AND PROJECTED GROSS PRODUCT ORIGINATING BY MAJOR INDUSTRIES

WRPA 10 PROGRAM B

AD-A041 349 LOWER MISSISSIPPI REGION COMPREHENSIVE STUDY COORDINA--ETC F/G 8/6
LOWER MISSISSIPPI REGION COMPREHENSIVE STUDY. APPENDIX B. ECONO--ETC(U)
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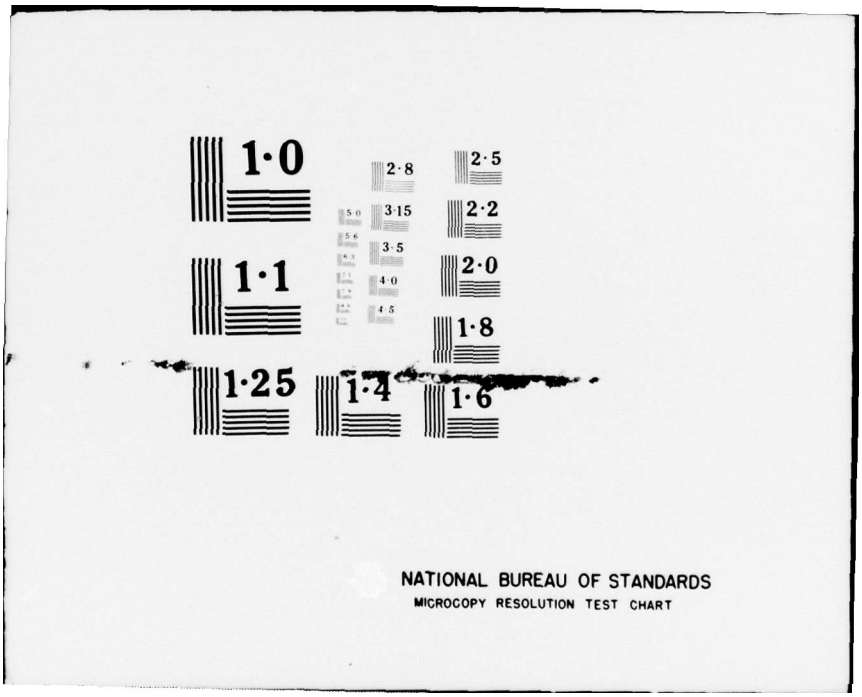

1·0
1·1
1·25
1·4
1·6
1·8
2·0
2·2
2·5
2·8
3·15
3·5
4·0
4·5
5·0
5·6
NATIONAL BUREAU OF STANDARDS
MICROCOPY RESOLUTION TEST CHART

Table 90 - Agricultural Production (Crops and Livestock) in WRPA 10

| Commodity | Unit of Measurement | Data for Indicated Years 1959 | 1970 | 1980 | 2000 | 2020 |
|---|---|---|---|---|---|---|
| Cotton | Bales | | | | | |
| Program A 1/ | | 44 | 43 | 0 | 0 | 0 |
| Program B 1/ | | -- | -- | 0 | 0 | 0 |
| Corn | Bushels | | | | | |
| Program A | | 376,057 | 160,000 | 0 | 0 | 0 |
| Program B | | -- | -- | 0 | 0 | 0 |
| Sorghum | Bushels | | | | | |
| Program A | | 190 | 12,000 | 22,000 | 29,000 | 40,000 |
| Program B | | -- | -- | 22,000 | 31,000 | 43,000 |
| Oats | Bushels | | | | | |
| Program A | | 7,675 | 5,550 | 4,000 | 4,000 | 4,000 |
| Program B | | -- | -- | 4,000 | 4,000 | 4,000 |
| Rice | Bushels | | | | | |
| Program A | | 216,184 | 105,000 | 0 | 0 | 0 |
| Program B | | -- | -- | 0 | 0 | 0 |
| Irish Potatoes | Bushels | | | | | |
| Program A | | 93,037 | 80,000 | 131,000 | 171,000 | 221,000 |
| Program B | | -- | -- | 131,000 | 183,000 | 237,000 |
| Sweet Potatoes | Bushels | | | | | |
| Program A | | 8,913 | 4,500 | 0 | 0 | 0 |
| Program B | | -- | -- | 0 | 0 | 0 |
| Tobacco | Pounds | | | | | |
| Program A | | 0 | 0 | 0 | 0 | 0 |
| Program B | | 0 | 0 | 0 | 0 | 0 |
| Sugarcane | Tons | | | | | |
| Program A | | 2,310,208 | 3,770,000 | 4,139,000 | 4,814,000 | 5,403,000 |
| Program B | | -- | -- | 4,139,000 | 5,172,000 | 5,802,000 |
| Wheat | Bushels | | | | | |
| Program A | | 15 | 5,000 | 14,000 | 17,000 | 19,000 |
| Program B | | -- | -- | 14,000 | 18,000 | 20,000 |
| Soybeans | Bushels | | | | | |
| Program A | | 1,854 | 375,000 | 706,000 | 869,000 | 1,019,000 |
| Program B | | -- | -- | 706,000 | 934,000 | 1,095,000 |

1/ Program A data incorporates 1970 production estimates; Program B data reflect the projected national growth rate shown in Table II-3, Selected Agricultural Products, pages II-18 through II-22, Volume 1, Economic Activity in the United States by Water Resource Regions and Subareas, Historical and Projected, 1929-2020, United States Water Resources Council, April 1971.

Table 90 - Agricultural Production (Crops and Livestock) in WRPA 10 (Con.)

| Commodity | Unit of Measurement | Data for Indicated Years 1959 | 1970 | 1980 | 2000 | 2020 |
|---|---|---|---|---|---|---|
| Forest Products 2/ | Thousands of Cubic Feet | | | | | |
| Program A | | -- | 16,000 | 19,000 | 24,000 | 31,000 |
| Program B | | -- | -- | 35,000 | 60,000 | 90,000 |
| Hay | Tons | | | | | |
| Program A | | 14,132 | 15,787 | 44,000 | 54,000 | 67,000 |
| Program B | | -- | -- | 44,000 | 58,000 | 72,000 |
| Gross Value of Crops | Thousands of 1967 Dollars | | | | | |
| Program A | | 21,000 | 33,000 | 47,000 | 55,000 | 62,000 |
| Program B | | -- | -- | 47,000 | 61,000 | 70,000 |
| | | Livestock Thousands 3/ | | | | |
| Beef | Pounds | | | | | |
| Program A | | -- | 12,692 | 16,204 | 21,811 | 29,292 |
| Program B | | -- | -- | 16,204 | 23,430 | 31,456 |
| Pork | Pounds | | | | | |
| Program A | | -- | 2,564 | 2,922 | 3,817 | 4,955 |
| Program B | | -- | -- | 2,922 | 4,100 | 5,321 |
| Lamb | Pounds | | | | | |
| Program A | | -- | 54 | 41 | 49 | 60 |
| Program B | | -- | -- | 41 | 53 | 64 |
| Chickens | Pounds | | | | | |
| Program A | | -- | 447 | 599 | 836 | 1,123 |
| Program B | | -- | -- | 599 | 898 | 1,206 |
| Turkeys | Pounds | | | | | |
| Program A | | -- | 7 | 9 | 13 | 17 |
| Program B | | -- | -- | 9 | 14 | 18 |
| Eggs | Dozen | | | | | |
| Program A | | -- | 1,626 | 1,775 | 2,273 | 2,879 |
| Program B | | -- | -- | 1,775 | 2,442 | 3,092 |
| Milk | Pounds | | | | | |
| Program A | | -- | 16,288 | 14,917 | 18,411 | 22,485 |
| Program B | | -- | -- | 14,917 | 19,778 | 24,146 |
| Gross Value of Livestock | 1967 Dollars | | | | | |
| Program A | | 4,120 | 3,938 | 5,664 | 7,468 | 9,808 |
| Program B | | -- | -- | 5,664 | 8,023 | 10,533 |

2/ Includes sawlogs, veneer logs, pulpwood, poles, etc., cut for industrial or consumer uses. (U. S. Forest Service.)

3/ Net liveweight production.

In 1970, farm marketing receipts totaled $36.5 million. Of this, 89 percent accrued from the sale of field crops. Total gross farm income was $42.4 million, realized net farm income $12.7 million, and derived net income per farm $4,868. The production of sugarcane, soybeans, and hay accounted for 88 percent of the total harvested acreage. Income from livestock and poultry enterprises (from only 325 farms) represented 11 percent of the total farm income.



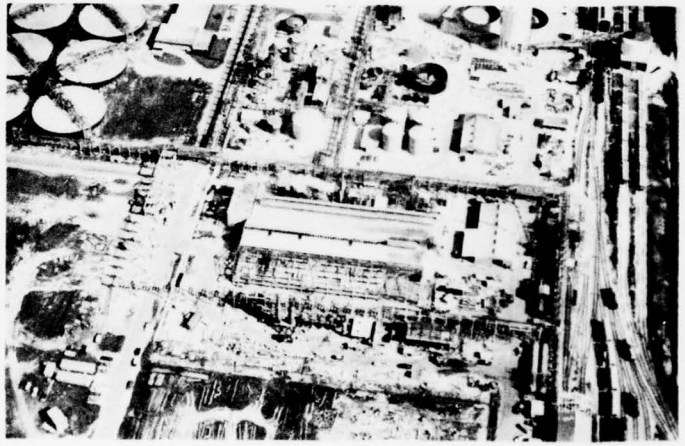
Traffic in Industrial Canal and Mississippi River, New Orleans, La.



Foot of Canal Street, New Orleans, La.



Sugar refinery, Reserve, La.



Aluminum and chemical plant, Gramercy, La.

## HISTORICAL TRENDS

### Population

The population of WRPA 10 increased 81 percent during the period 1940-1970, i.e., from 726,783 to 1,315,504 (BEA estimates, 1 July of given years). Urbanization within the area has increased over the years, and 80 percent of the total population now resides in the New Orleans SMSA. Total urban population in the area has grown from 79 percent (estimated) in 1940 to 83 percent in 1970. This shift in population distribution reflects an increase in industrial activity as well as a decline in manpower engaged in agricultural pursuits.

### Employment

Total employment in WRPA 10 increased from 243,719 to 460,500 between 1940 and 1968, an increase of 89 percent. The largest gains were recorded in the manufacturing, mining, and services sectors; the only loss occurred in agriculture, forestry, and fishery sectors. The trade, services, and manufacturing sectors have the greatest shares of total employment with 22, 16, and 15 percent, respectively.

### Personal and Per Capita Income

Personal income has been increasing at a more rapid rate than population, thereby creating substantial gains in per capita income. From 1940 to 1968, total personal income increased from $945 million to approximately $4 billion (1967 dollars), a 314 percent gain. Per capita income increased from $1,296 to $3,051 (1967 dollars), a gain of 135 percent. However, per capita income is still below the 1968 national average of $3,301 (1967 dollars).

## ECONOMIC PROBLEMS

As of January 1972, the only parishes qualified for Federal assistance under the Public Works and Economic Development Act of 1965 are Assumption and St. John the Baptist. Both parishes have been designated as Title 4 areas due to persistently high unemployment rates and therefore qualify for public works grants and loans as well as for business development loans. Although all other parishes in the area except Lafourche, St. Charles, Terrebonne, and Plaquemines Parishes have unemployment rates higher than the national average, these rates were not severe enough to qualify the parishes for any Federal assistance. The qualifications for assistance under the Act are generally based on consistently high unemployment rates or on median family incomes not higher than 40 percent of the national median.

### Low Income Levels

Historically, economic activity in the New Orleans SMSA has been vigorous enough to keep WRPA 10 per capita income figures around 90 percent of the United States average. However, in 1967 there were some parishes within the area with extremely low per capita averages. In terms of percentage of the national average, the Parishes of Assumption (46 percent), Lafourche (56 percent), Plaquemines (57 percent), St. John the Baptist (64 percent), Terrebonne (72 percent), and St. James (72 percent) rank as the poorest in the area.

### Unemployment and Underemployment

The national rate of unemployment increased from 4.5 to 5.9 percent between 1965 and 1971. The unemployment rate in the New Orleans SMSA increased from 4.1 to 6.4 percent between 1967 and 1971. In 1971, the unemployment rates in Lafourche, Plaquemines, St. Charles, and Terrebonne Parishes were below the national average. The remaining parishes had rates higher than the national average but lower than the 8.1 percent experienced by Assumption Parish.

## PROGRAM A, NATIONAL INCOME

Projections show substantial gains in all economic indicators for the period 1968-2020 in WRPA 10. Population is expected to increase by 86 percent, total employment by 99 percent, and total personal income by 804 percent. On an individual basis, per capita income is expected to increase at a rate faster than that for the United States and to be almost equal to the national average by 2020. Per worker earnings exceeded the national average in 1968 and are expected to remain above the national average through 1980. From 1980 to 2020, per worker earnings are expected to decline slowly until, in 2020, they are 1.8 percent below the national average.

Employment projections derived from earnings indicate that the manufacturing sector will continue to register good growth, the mining sector will level off, and the agriculture, forestry, and fishery sectors will continue their manpower declines. The two fastest growing industries within the manufacturing sector are expected to be chemicals and primary metals.

## PROGRAM B, REGIONAL DEVELOPMENT

Under Program B, the population of WRPA 10 is expected to reach 2.7 million by 2020. This is an increase of 111 percent from 1968, as opposed to an 86 percent increase under Program A. This additional 25 percent gain is primarily caused by increases in both the employment and participation rates.

The employment rate is projected to increase by 135 percent under Program B between 1968 and 2020, a rate 36 percent higher than that for Program A. This is primarily due to the high rates of employment projected in the manufacturing sector of the economy, especially in the chemical and allied products industry. Employment in manufacturing is expected to increase 171 percent during this period under Program B, a rate 42 percent higher than that foreseen for Program A. The largest increase in manufacturing employment is projected to occur in the chemical and allied products industry. During the period 1960-2020, manufacturing employment is expected to increase 391 percent under Program B, which is 75 percent more than under Program A. Total employment in several major industrial groupings will decrease during this period, but the decline will be less under Program B than under Program A. The industries with negative employment trends are agriculture, textile mill products, food and kindred products, and petroleum refining.

Personal income is expected to increase by 848 percent, and per capita income by only 349 percent under Program B. However, under Program A the increases are 704 percent and 332 percent, respectively. Under Program B, the per capita income will be only 3.85 percent below the national average, as compared with 7.5 percent below under Program A. Per worker earnings do not vary under the two plans, but the total earnings do increase from Program A to Program B by 138 percent. Per worker earnings will be 1.8 percent below the national average under Program B.

## OUTLOOK FOR THE FUTURE

The availability of abundant resources presages continued economic development in WRPA 10. The New Orleans SMSA is the trading, shipping, and banking center of the deep south. Intensified industrialization and urbanization are anticipated. Population grew between 1950 and 1968 at an annual compound rate exceeding 2 percent and is projected to continue to increase to the year 2020 at an annual rate approximating 1.2 percent or slightly under the 1.3 percent projected nationally.

The growth of personal income in WRPA 10 between 1950 and 1968 was at an annual compound rate of 4.75 percent, greatly exceeding the rate at which population increased. It is projected that personal income will continue to increase to the year 2020 at a rate comparable to that of the national average.

Per capita income, which in 1968 represented 92 percent of the national figure, is anticipated to maintain this relative position to the year 2020. Growth of per capita income in WRPA 10 from 1950 to 1968 was 2.6 percent annually, whereas the projected rate is just under 2.9 percent.

Employment in this WRPA is projected to increase to the year 2020 at a declining rate. The annual growth rate between 1950 and 1968 was 2.2 percent; however, an annual rate of about 1.3 percent is projected for the future, a rate approximating that projected nationally.

Earnings in the period 1950 to 1968 increased about 4.8 percent annually. Projections indicate a reduction in this rate to the year 2020 to 4 percent, or approximately the national rate.

# METHODOLOGY

# METHODOLOGY

## GENERAL

Economic projections prepared by the Bureau of Economic Analysis (BEA), U. S. Department of Commerce, and the Economic Research Service (ERS), U. S. Department of Agriculture, under contract with the Water Resources Council 1/ were used as guidelines in establishing forecasts for the Lower Mississippi Region. Specific projections (popularly termed OBERS projections) were made for the years 1980, 2000, and 2020, covering each major river basin in the United States.

National projections were prepared covering population, gross national product, total personal and per capita income, employment and earnings by 28 industry groups, and average per worker earnings. Regional projections, with the national projections used as control totals, were then made for 173 economic areas consisting of urban centers and their surrounding trade territories. Finally, regional economic area projections were recomputed for major river basins, or WRPA's.

## NATIONAL PROJECTIONS

The first step in preparing national forecasts was the projection of the gross national product. 2/ This was done by multiplying projected man-hours worked by projected production per man-hour. The number of man-hours for each specified future area is a mathematical function of the projected working age population, the labor force participation rate, and hours to be worked per person. The anticipated population is based on Bureau of Census Series C projections, which assumes a fertility rate of 2,787 births per 1,000 women by the year 2000. If a zero population growth rate, as advocated by several environmental groups in the early 1970's, is realized, the number of births per 1,000 women should be 2,111. The population by 2020 would then be approximately 300,000,000 rather than the 399,000,000 forecast in this appendix.

The working age population, labor force participation rate,

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1/ United States Water Resources Council, Economic Activity in the United States by Water Resources Regions and Subareas, Historical and Projected, 1929-2020, Volume 3, Washington, D. C., 1971.

2/ Ibid, Volume 1; describes the projection methodology and computer models utilized by BEA and ERS in preparing the economic forecasts.

unemployment rate, and hours worked per man per year were each projected separately using all information and analyses available in each case. The population of working age by age and sex is a subset of the total population. The labor force was derived by applying age- and sex-specific participation rates developed by the Bureau of Labor Statistics to the working age population. A 4 percent unemployment rate was adopted as representing full employment nationally. Hours worked per man per year in the private economy were projected to decrease by 0.25 percent per year, as compared with the post-World War II average decrease of 0.4 percent per year.

Real gross product per man-hour in the private economy increased at an annual rate of 3.2 percent from 1950 to 1968. The projection puts productivity growth at an annual rate of increase of 3 percent from 1968 to 2020. This projected rate is somewhat lower than the 1950-1968 rate to allow for the fact that some part of the productivity growth in 1950-1968 was attributable to a massive movement from farm to nonfarm work; such movement cannot be repeated on a similar scale in the future. There are a variety of opinions on the validity of the 3 percent rate. Some forecasters would lower the projected rate still further because of the projected shift in work force distribution away from higher productivity manufacturing to the lower productivity service industries; others would raise it on the grounds of expected technological advances. By and large, in view of all known factors, the 3 percent rate appears reasonable.

## REGIONAL PROJECTIONS

Once projections had been made at the national level for gross product, earnings, and employment by industry, the next step was to develop forecasts for subnational areas with the national industry totals serving as constraints. The areas chosen were the 173 economic areas into which BEA has divided the country as part of its program of regional measurement, analysis, and projection. Each area consists of an urban center and surrounding counties which are tied to the center by economic activity. Each area generally combines place of residence and place of work so that there is a minimum of commuting across area boundaries.

Each economic area has two types of industries. Export industries produce goods and services that are, for the most part, exported to other areas, providing most of the earnings with which the area residents purchase the specialized goods and services and some of the goods required by local businesses as intermediate products and by the household sector. Each economic area approaches self-sufficiency with respect to its residentiary industries.

Estimates of total personal income, earnings by industry, and the nonearnings component of personal income in each SMSA and non-SMSA county have been prepared by BEA for 1929, 1940, 1950, 1959, 1962, and annually from 1965 forward. Estimates for 1962, 1965, and 1966 were made by moving the census data forward from 1960 with employment data from County Business Patterns, supplemented by data from the American Railroad Association, State employment security agencies, the American Hospital Association, the Social Security Administration, and several economic censuses. Because there is very little commuting across economic area lines, the census-based employment data for economic areas, which reflect residence of the employees, are compatible with the earnings data, which reflect place of work.

## Measures of Economic Activity

Economic activity in the Lower Mississippi Region is measured primarily by personal income with its earning subcomponent and population. Employment is also used to a limited extent and rough estimates of gross product by industry have been made. Personal income is the current income received by residents of an area from all sources. It consists of wages and salaries; various types of supplementary labor returns, termed other labor income; proprietor's income (the net income of owners of unincorporated businesses); property income and transfer payments (consisting in general of disbursements to persons for which no services are rendered currently, such as unemployment benefits, social security payments, and welfare and relief payments). Contributions to social insurance are deducted.

Earnings, the major component of personal income, is available by industry, and reflects the increased productivity of workers. It is therefore the principle measure of industrial economic activity. Historical and projected earnings by industry are presented for each geographic area.

A rough estimate of gross product by industry has been derived for each WRPA by applying national relationships between earnings and gross product to the projected WRPA earnings. These gross product estimates have two shortcomings and should be used with caution. First, the gross product estimates are presented for two-digit SIC categories. Within each of these categories there is an industry mix which may vary from area to area. For the individual industries within that mix, both the level and trend of the earnings/gross product relationship may be different from the relationship for the class as a whole. The reliability of the gross product estimates for a two-digit industry in an area depends on the industry mix in the area and the degree of similarity in the earnings/gross product relationship to the national group relationships. The second shortcoming lies in the differences that occur from region to region in the earnings/gross product relationships

within any sharply defined industry. In spite of these shortcomings, it is believed that gross product estimates are reasonably reliable for estimating future water needs.

### Program A

OBERS economic projections for the 173 BEA economic areas were recomputed for each major river basin covering population, total personal and per capita income, total employment, and earnings by each of the 28 industry groups. Historical economic trends of each area were the major controlling factors for establishing Program A forecasts for industry group earnings. Total employment and total personal income for the respective WRPA's are derivatives of projected total earnings; population, in turn, is calculated from future employment based on a projected employment/population ratio.

Forecasts of employment by each of the major industry groups were calculated based on averages derived from OBERS projections for applicable BEA economic areas.

Gross product originating by major industry groups, as presented for each WRPA, was calculated utilizing coefficients of the relation between earnings and gross product originating as developed nationally by BEA.

### Program B

Separate forecasts were developed based on the criterion that economic growth for the Lower Mississippi Region, as measured by employment opportunities, would in future years at least equal the average rate of growth for the Nation. 3/ Program B reflects the concept of regional development so that employment and earnings forecasts average about 20 percent higher than the conservative Program A forecasts for 2020.

Generally, the economic forecasts for the various WRPA's hold the same relationship to each other under Program B as under Program A.

Population forecasts for each WRPA are derived by applying the Program B employment participation rate (employment/population ratio, table 91) to projected employment.

---

3/ OBERS' forecast is for regional employment to increase at 1.1 percent annually, as compared with 1.4 percent nationally.

Table 91 - Employment Participation Rates 1/ for United States, Lower Mississippi Region, and WRPA's

| Area | Employment Participation Rates for Indicated Years | | | |
|---|---|---|---|---|
| | 1968 | 1980 | 2000 | 2020 |
| United States | 0.39 | 0.40 | 0.41 | 0.41 |
| Lower Mississippi Region | | | | |
| Program A | 0.35 | 0.36 | 0.37 | 0.38 |
| Program B | 0.35 | 0.37 | 0.39 | 0.40 |
| WRPA 2 | | | | |
| Program A | 0.33 | 0.34 | 0.37 | 0.40 |
| Program B | 0.33 | 0.35 | 0.38 | 0.40 |
| WRPA 3 | | | | |
| Program A | 0.39 | 0.40 | 0.40 | 0.40 |
| Program B | 0.39 | 0.40 | 0.41 | 0.41 |
| WRPA 4 | | | | |
| Program A | 0.35 | 0.36 | 0.37 | 0.39 |
| Program B | 0.35 | 0.36 | 0.38 | 0.40 |
| WRPA 5 | | | | |
| Program A | 0.33 | 0.33 | 0.34 | 0.36 |
| Program B | 0.33 | 0.34 | 0.35 | 0.37 |
| WRPA 6 | | | | |
| Program A | 0.28 | 0.29 | 0.32 | 0.35 |
| Program B | 0.28 | 0.30 | 0.34 | 0.36 |
| WRPA 7 | | | | |
| Program A | 0.36 | 0.37 | 0.38 | 0.39 |
| Program B | 0.36 | 0.37 | 0.38 | 0.39 |
| WRPA 8 | | | | |
| Program A | 0.33 | 0.34 | 0.37 | 0.38 |
| Program B | 0.33 | 0.35 | 0.38 | 0.40 |
| WRPA 9 | | | | |
| Program A | 0.34 | 0.34 | 0.35 | 0.36 |
| Program B | 0.34 | 0.35 | 0.36 | 0.38 |
| WRPA 10 | | | | |
| Program A | 0.36 | 0.36 | 0.38 | 0.38 |
| Program B | 0.36 | 0.37 | 0.39 | 0.40 |

1/ Total employment divided by total population.

Per worker earnings are the same under both Programs A and B, as the Economics Subcommittee agreed that the 3 percent annual increase in productivity would apply to both programs. Per capita income, calculated by dividing the projected total annual personal income by the corresponding population projection, is higher under Program B because under Program B a higher proportion of the population will be employed.

# ADDENDUM

# A D D E N D U M

## COMPARISON OF PROGRAMS A AND B WITH 1972 OBERS PROJECTIONS 1/

Revised OBERS projections were released after the main text of the Economics Appendix was prepared. National projections are the same except for slight increases in mining and contract construction activities offset by a slight decrease in production of electrical equipment and supplies. For the Lower Mississippi Region, however, some increases in economic activity are forecast as a result of evaluating recent economic trends.

By 2020, for example, total employment for the Lower Mississippi Region is projected to be 3.4 percent higher than shown under Program A, i.e., from 3,917,000 to 4,050,000. Overall expansion in economic activity consequently results in a 3.7 percent increase in total earnings by 2020. Particularly important are production increases of chemicals and processed food.

No change in Program B 2/ forecasts for the entire Lower Mississippi Region is indicated. Consequently, the differences bbetween Programs A and B would be slightly less if all calculations were based on the 1972 OBERS projections.

Most of the regional increased economic activity under the 1972 OBERS projections is forecast for southern Louisiana, centered around the New Orleans, Baton Rouge, and Lake Charles - Lafayette areas. In all instances, however, Program A would remain below Program B. Future water needs that were calculated under Program A, therefore, should be considered conservative.

Tables 92 and 93 compare the population and total employment projections for 2020 under Program A, revised 1972 OBERS, and Program B for each WRPA of the Lower Mississippi Region. A summary of the revised forecasts for the region is presented in table 94.

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1/ 1972 OBERS projections: Economic Activity in the United States by BEA Economic Areas, Water Resources Regions, Subareas, and States, Historical and Projected, 1929-2020, United States Water Resources Council, Washington, D. C., 1972.

2/ Program B, as previously explained, is based on an annual rate of increase for the region of 1.4 percent in employment and economic activity as compared with the Program A rate of 1.1 percent.

Table 92 - Projected Population in Lower Mississippi Region for 2020

| WRPA | Program A | Revised OBERS | Percent Change | Program B |
|---|---|---|---|---|
| 1 | 1/ | 1/ | 1/ | 1/ |
| 2 | 795,000 | 792,100 | -0.4 | 925,000 |
| 3 | 2,569,000 | 2,517,000 | -2.0 | 2,983,000 |
| 4 | 828,000 | 846,100 | +2.2 | 941,000 |
| 5 | 1,210,000 | 1,226,200 | +1.3 | 1,377,000 |
| 6 | 193,000 | 195,900 | +1.5 | 212,000 |
| 7 | 217,000 | 226,300 | +4.3 | 254,000 |
| 8 | 1,003,000 | 1,060,700 | +5.8 | 1,138,610 |
| 9 | 994,000 | 1,041,000 | +4.7 | 1,117,000 |
| 10 | 2,386,000 | 2,521,700 | +5.7 | 2,707,000 |
| Region 2/ | 10,196,000 | 10,427,300 | +2.3 | 11,655,000 |
| U. S. | 399,013,000 | 399,013,000 | 0.0 | 1/ |

1/ Not applicable.
2/ Details may not add to totals because of rounding.

Table 93 - Projected Total Employment in Lower Mississippi Region for 2020

| WRPA | Program A | Revised OBERS | Percent Change | Program B |
|---|---|---|---|---|
| 1 | 1/ | 1/ | 1/ | 1/ |
| 2 | 314,000 | 314,400 | 0.1 | 371,000 |
| 3 | 1,037,000 | 1,013,400 | -2.3 | 1,223,000 |
| 4 | 319,000 | 338,500 | +6.1 | 376,000 |
| 5 | 432,000 | 459,000 | +6.3 | 510,000 |
| 6 | 67,000 | 72,100 | +7.6 | 78,000 |
| 7 | 84,000 | 88,300 | +5.1 | 99,000 |
| 8 | 386,000 | 408,600 | +5.9 | 455,000 |
| 9 | 360,000 | 384,000 | +6.7 | 425,000 |
| 10 | 918,000 | 971,500 | +5.8 | 1,083,000 |
| Region | 3,917,000 | 4,050,300 | +3.4 | 4,620,000 |
| U. S. | 163,622,000 | 163,622,000 | 0.0 | 1/ |

1/ Not applicable.

Table 94 - Lower Mississippi Region Population, Employment, Personal Income, and Earnings for Selected Years 1/

| Parameter | 1950 | 1959 | 1962 | 1968 | 1969 | 1980 | 1990 | 2000 | 2010 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|
| Population, Midyear | 5,545,348 | 5,826,287 | 6,064,758 | 6,294,967 | 6,297,000 | 6,852,700 | 7,547,300 | 8,339,400 | 9,309,900 | 10,427,300 |
| Per Capita Income (1967 Dollars) | 1,310 | 1,664 | 1,756 | 2,451 | 2,507 | 3,685 | 4,923 | 6,786 | 9,138 | 12,228 |
| Relative Per Capita Income (U. S. = 1.00) | .63 | .68 | .68 | .74 | .73 | .77 | .80 | .82 | .84 | .86 |
| Total Employment | 1,832,672 | 1,873,933 | | 2,212,522 | 2,239,284 | 2,515,500 | 2,772,000 | 3,159,800 | 3,585,700 | 4,050,300 |
| Employment/Population Ratio | .33 | .32 | | .35 | .36 | .37 | .37 | .38 | .39 | .39 |
| Earnings per Worker (1967 Dollars) | 3,224 | 4,226 | | 5,550 | 5,610 | 7,885 | 10,427 | 13,823 | 18,193 | 24,004 |
| Relative Earnings per Worker (U. S. = 1.00) | .72 | .79 | | .83 | .82 | .84 | .86 | .87 | .89 | .90 |
| | In Thousands of 1967 Dollars | | | | | | | | | |
| Total Personal Income | 7,264,397 | 9,697,819 | 10,652,440 | 15,431,394 | 15,786,407 | 25,253,300 | 37,158,400 | 56,593,800 | 85,071,800 | 127,507,900 |
| Total Earnings | 5,908,180 | 7,918,962 | 8,557,173 | 12,278,532 | 12,562,497 | 19,835,000 | 28,903,200 | 43,679,900 | 65,234,100 | 97,224,800 |
| Agriculture, Forestry & Fisheries | 1,298,839 | 1,134,500 | 1,123,835 | 1,240,176 | 1,133,307 | 1,267,100 | 1,328,300 | 1,569,200 | 2,042,400 | 2,737,400 |
| Agriculture | 1,272,855 | 1,115,618 | 1,102,738 | 1,221,355 | 1,117,199 | 1,241,100 | 1,293,800 | 1,523,000 | 1,981,000 | 2,657,400 |
| Forestry & Fisheries | 25,987 | 18,883 | 21,101 | 18,828 | 16,114 | 25,900 | 34,400 | 46,200 | 61,400 | 80,000 |
| Mining | 137,291 | 344,679 | 342,345 | 451,379 | 490,335 | 628,900 | 775,700 | 968,200 | 1,176,400 | 1,430,800 |
| Metal | W 2/ | W | W | W | W | W | W | W | W | W |
| Coal | 69 | 0 | 2 | 35 | 66 | S 3/ | S | S | S | S |
| Crude Petroleum & Natural Gas | 108,892 | 297,275 | 303,458 | W | W | W | W | W | W | W |
| Nonmetallic, Except Fuels | W | W | W | 42,154 | 38,945 | 56,500 | 74,600 | 102,200 | 138,600 | 190,900 |
| Contract Construction | 357,184 | 474,170 | 488,540 | 953,547 | 905,223 | 1,364,600 | 1,965,300 | 2,929,500 | 4,314,100 | 6,326,000 |
| Manufacturing | 977,181 | 1,431,042 | 1,621,908 | 2,552,781 | 2,681,038 | 4,218,400 | 6,166,400 | 9,289,100 | 13,800,700 | 20,543,600 |
| Food & Kindred Products | 188,686 | 250,478 | 260,812 | 322,688 | 326,735 | 425,600 | 516,900 | 653,600 | 825,600 | 1,061,000 |
| Textile Mill Products | 29,199 | 31,657 | 36,292 | 49,121 | 57,765 | 90,600 | 128,100 | 184,600 | 261,000 | 371,100 |
| Apparel & Other Fabric Products | 57,570 | 88,320 | 112,507 | 168,823 | 171,563 | 272,400 | 388,200 | 564,500 | 805,900 | 1,154,800 |
| Lumber Products & Furniture | 215,700 | 207,844 | 204,378 | 304,194 | 320,090 | 457,000 | 611,400 | 841,100 | 1,145,700 | 1,576,800 |
| Paper & Allied Products | 76,689 | 129,895 | 152,291 | 193,790 | 204,224 | 317,900 | 457,900 | 679,500 | 993,100 | 1,453,000 |
| Printing & Publishing | 41,868 | 49,896 | 55,559 | 79,448 | 82,865 | 133,800 | 200,300 | 310,000 | 475,400 | 725,300 |
| Chemicals & Allied Products | 87,633 | 165,514 | 181,060 | 296,780 | 331,473 | 569,400 | 886,600 | 1,406,300 | 2,179,000 | 3,346,600 |
| Petroleum Refining | 93,794 | 123,652 | 120,752 | 151,091 | 152,275 | 203,900 | 266,000 | 355,400 | 467,900 | 627,000 |
| Primary Metals | 8,685 | 44,825 | 47,011 | 74,276 | 80,873 | 104,800 | 134,700 | 176,100 | 226,200 | 292,700 |
| Fabricated Metals & Ordnance | 21,852 | 53,269 | 97,641 | 232,669 | 224,416 | 391,400 | 612,700 | 978,600 | 1,524,900 | 2,348,400 |
| Machinery, Excluding Electrical | | 59,898 | 72,289 | 134,170 | 143,906 | 246,800 | 392,700 | 634,500 | 1,000,500 | 1,562,700 |
| Electrical Machinery & Supplies | | 19,432 | 32,861 | 108,698 | 120,860 | 230,300 | 383,300 | 645,600 | 1,044,600 | 1,676,000 |
| Total Machinery (1950 Only) | 22,916 | | | | | | | | | |
| Motor Vehicles & Equipment | 12,257 | 7,419 | 10,975 | 19,012 | 18,586 | 25,400 | 33,700 | 47,600 | 65,600 | 92,000 |
| Trans. Equip., Excl. Mtr. Vehs. | 26,162 | 45,225 | 62,807 | 144,345 | 157,218 | 273,700 | 426,000 | 675,300 | 1,044,600 | 1,607,200 |
| Other Manufacturing | 94,175 | 144,713 | 173,796 | 272,581 | 288,159 | 474,700 | 727,300 | 1,138,000 | 1,741,800 | 2,650,600 |
| Trans., Comm., & Public Utilities | 534,205 | 683,888 | 714,163 | 942,194 | 986,474 | 1,478,500 | 2,092,100 | 3,066,300 | 4,449,000 | 6,477,600 |
| Wholesale & Retail Trade | 1,135,961 | 1,471,982 | 1,534,246 | 2,090,974 | 2,165,507 | 3,550,400 | 5,220,000 | 7,924,800 | 11,831,300 | 17,589,200 |
| Finance, Insurance & Real Estate | 173,483 | 303,429 | 333,763 | 491,990 | 509,589 | 823,000 | 1,214,900 | 1,851,300 | 2,779,100 | 4,160,800 |
| Services | 640,249 | 939,854 | 1,048,262 | 1,552,220 | 1,626,446 | 2,864,800 | 4,484,900 | 7,184,900 | 11,235,400 | 17,340,900 |
| Government | 653,769 | 1,135,410 | 1,350,092 | 2,003,285 | 2,064,565 | 3,638,900 | 5,655,200 | 8,896,200 | 13,605,000 | 20,618,100 |
| Civilian Government | 548,406 | 934,812 | 1,100,574 | 1,665,515 | 1,727,172 | 3,226,200 | 5,121,900 | 8,205,300 | 12,713,200 | 19,461,700 |
| Armed Forces | 105,367 | 200,611 | 249,514 | 337,763 | 337,383 | 412,600 | 533,300 | 690,800 | 891,800 | 1,156,400 |
| Population April 1, 1970 6,295,923 | | | | | | | | | | |

1/ Revised Water Resources Council data from 1972 OBERS projections, Ibid.
2/ W—withheld to avoid disclosing company confidential information.
3/ S—too small to be projected.

# WATER RESOURCES PLANNING AREAS

