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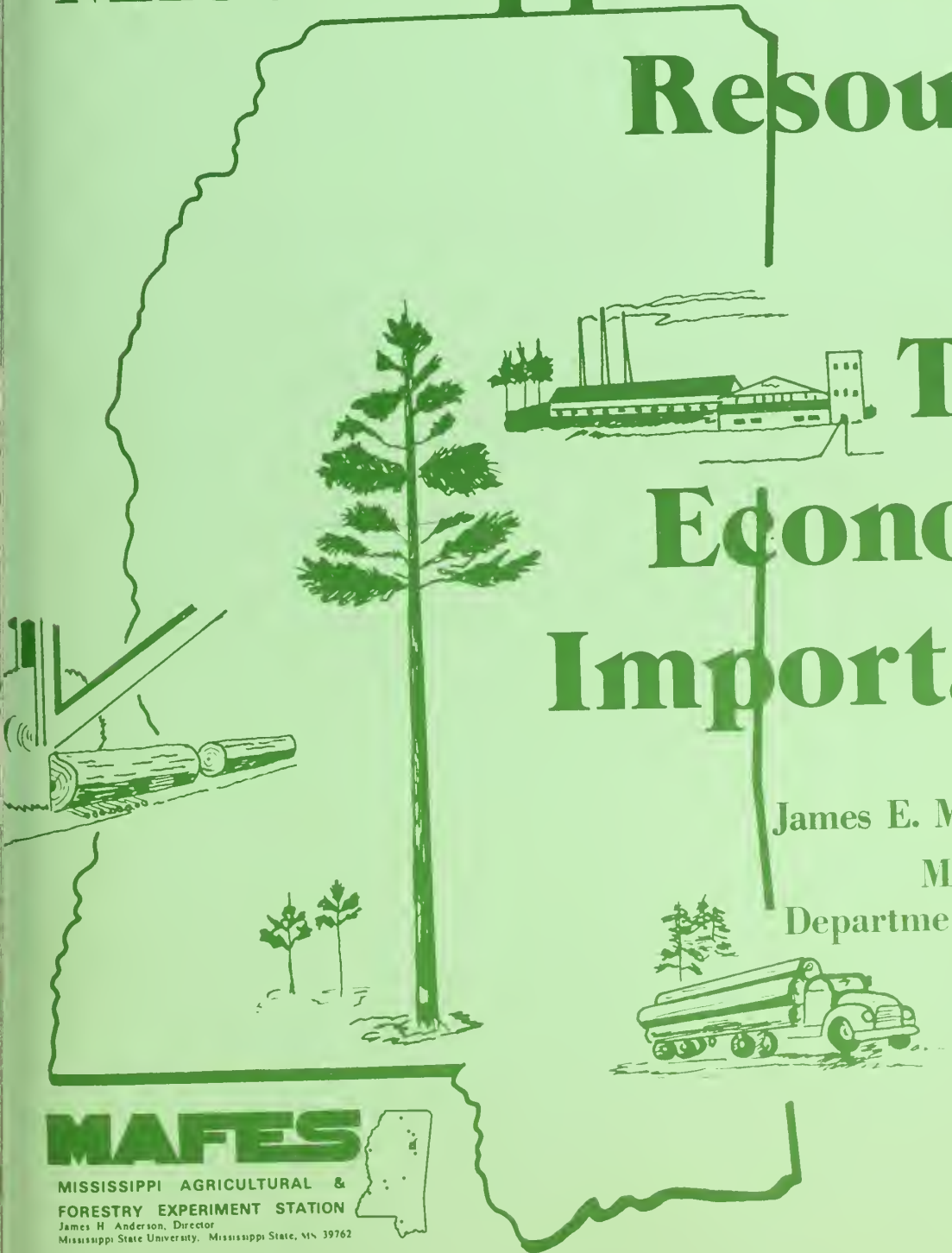
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*Leaf
Sheep*

Mississippi's Timber Resources and Their Economic Importance

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Preface

Mississippi is blessed with an abundance of natural resources---oil, gas, coastal waters, navigable waterways, rich delta farmland, and nearly 17 million acres of forest land. Timber production and processing was a major source of income even before the turn of the 20th century.

There is constant need for documenting the importance of timber production and processing to Mississippi's economy. This report, prepared to show this importance, uses three widely

accepted measures of economic activity: employment, payrolls, and value added. Each of these is estimated for the growing, harvesting, marketing, processing, utilization and construction stages.

Analysis is based on 1973 data unless other dates are indicated. This Bulletin updates results of an earlier study published in 1971 under the title "Forestry: Its Economic Importance to Mississippi" (Moak, 1971). Details of the computational procedure may be

found in the Appendix.

Estimates shown in this report are not of equal reliability. Estimates of value added in manufacturing in 1973 were projected from data reported in the 1972 Census of Manufacturers. Employment, payrolls and value added in transportation, marketing and construction were derived by less precise methods. Even so, it is believed that estimates presented in this report can be useful if interpreted with reference to how they were derived.

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Mississippi's Timber Resources and Their Economic Importance

Summary & Highlights

Growing, processing, and using timber are the major forest-related activities that make forestry vitally important to the Mississippi economy.

Additional benefits derived from Mississippi forests are---forest related recreation, wildlife,

aesthetics and the forests' contribution to pure water and clean air. Measuring these benefits in monetary terms is not possible, but they obviously contribute importantly to the quality of life that Mississippians enjoy.

55 percent of total land area in Mississippi is in commercial forests.

73 percent of commercial forest land is in nonindustrial forests.

In 1972:

Total growing stock	=	14.2 billion cubic feet
Growth	=	775.5 million cubic feet
Removals	=	700.2 million cubic feet
Net Increase in Inventory	=	75.3 million cubic feet

In 1973:

Beginning growing stock inventory, 14.3 billion cubic feet.

Harvested timber was valued at 118 million dollars in the woods and sold for 220 million dollars at the first delivery point.

Wood-based manufacturing is among the top industrial employers in the state.

36 percent of all manufacturing plants are wood-based.

18 percent of all manufacturing employment and payrolls is in wood-based plants.

22 percent of all value added in manufacturing is in wood-based plants.

74,100 full time jobs can be attributed to timber-based economic activities.

\$469.7 million in annual payrolls can be attributed to timber based economic activities.

\$1.034 billion of value added in Mississippi can be attributed to timber-based economic activities.

Forest Land

Table 1. Acreage of commercial forest land in Mississippi, selected years, with comparisons.

REGION	Year				
	1935	1948	1957	1967	1973
-----Thousand Acres-----					
Delta	2,227	2,043	1,917	1,494	1,307
North	3,127	3,723	4,204	4,195	4,142
Central	5,900	6,020	3,792	3,960	4,447
Southwest			2,747	2,755	2,749
South	4,889	4,746	4,533	4,489	4,056
TOTALS	16,143	16,533	17,194	16,893	16,701
PERCENT OF TOTAL LAND	52	54	57	56	55

Sources: Forest Survey release #59, Miss. Forests 1958; Mississippi Forest Resources, 1968; For. Ser. Bull SO-44, 1973; all published by So. For. Exp. Sta., New Orleans, LA.

Forestry has been the dominant use for land in Mississippi from the arrival of the white man, when practically all of Mississippi was covered with trees, until today, when 55 percent of the land in the state is classified as commercial forest land.

Land use has shifted between forestry and agriculture since the Civil War. Acreage of land in forests increased from 1935 to 1957 and decreased from 1957 to 1973 (Table 1). The net loss in forest acreage from 1967 to 1973 was due primarily to clearing of 190,000 acres for annual agricultural crops in the Delta. However, there is still more land in forests today than in 1935.

Current land use proportions are shown in Figure 1.

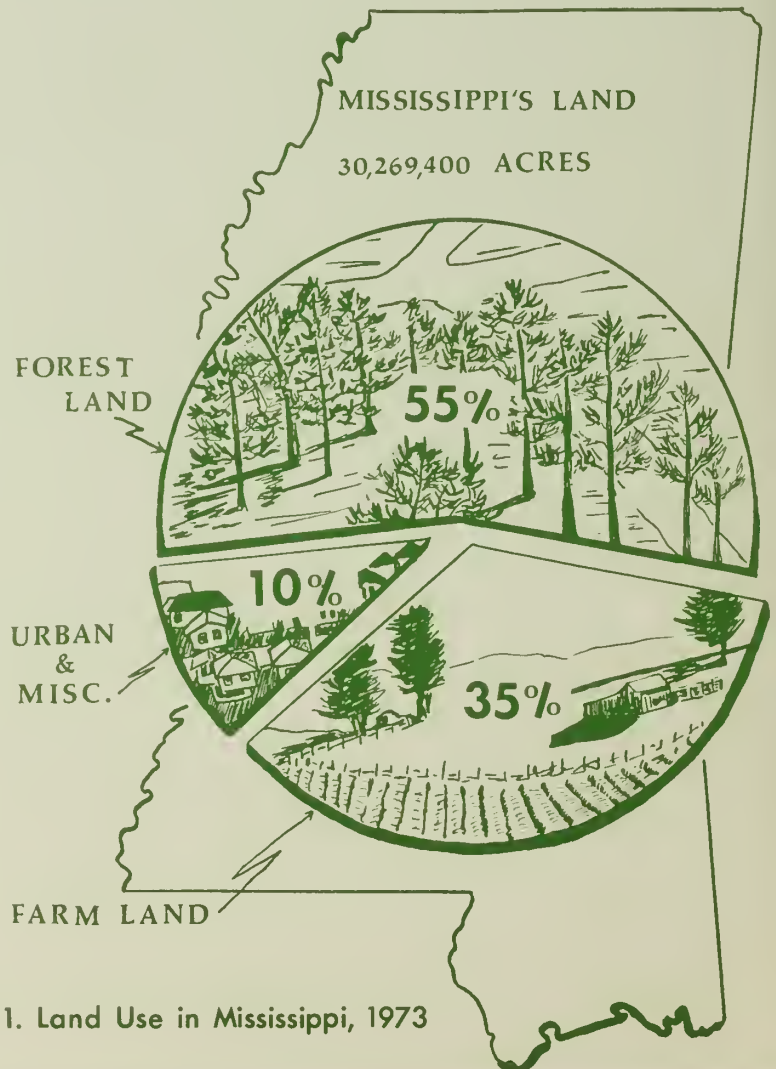


Figure 1. Land Use in Mississippi, 1973

Ownership

Table 2. Ownership of commercial forest land, by ownership classes, Mississippi, 1957 and 1972.

OWNERSHIP CLASS	AREA	
	1957	1972
	----Thousand Acres----	
PUBLIC:		
National Forest	1,114.9	1,118.8
Other Federal	150.3	180.7
State	54.5	93.3
County and municipal	397.2	377.4
TOTAL PUBLIC	1,716.9	1,770.2
PRIVATE:		
Forest Industry	2,514.0	2,625.7 ¹
Farmer	7,410.5	4,841.1 ²
Other Private	5,552.2	7,463.2
TOTAL PRIVATE	15,476.7	14,930.0
All Ownerships	17,193.6	16,700.2

¹Does not include more than 300,000 acres leased from nonindustrial private owners.

²Source: Census of Agriculture, 1969.

Other data from USDA Forest Service, SO-17, and SO-44, So. For. Exp. Sta., New Orleans, LA, 1969 and 1973.

Ownership of the 16.7 million acres of forest land in Mississippi is predominantly by individuals--almost three-fourths of the total or over 12 million acres. More than seven million acres are owned by businessmen, factory workers, retirees, doctors, lawyers, housewives and other non-farmers. This group is generally referred to as *other private* to distinguish them from farmers, who own some 28 percent or 5 million acres. (Table 2).

Only 11 percent of the forest land is in public ownership (less than 2 million acres) and slightly more than one million acres of this are in National Forests. Industrial forest ownership is estimated at 16 percent. (Figure 2.)

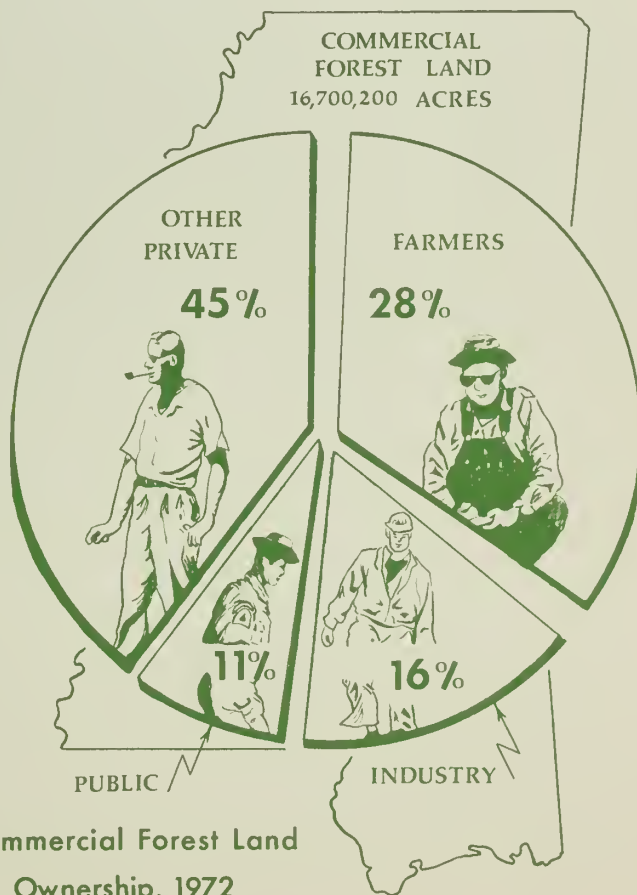


Figure 2. Commercial Forest Land by Ownership, 1972

Timber Inventories

Standing timber inventories have fluctuated since initial cuts were made in virgin stands. Volume was very low in the early 1930's but had increased to 7.7 billion cubic feet in 1948. However, heavy cutting reduced it to 7.6 billion cubic feet in 1957. A combination of reduced cut and better management resulted in a build-up to 13 billion cubic feet in 1967.

Harvest increased during the next six years in response to rapidly expanding industrial capacity and the inventory stood at 14.2 billion cubic feet in 1973 (Table 3). The 1973 inventory cannot be ascribed entirely to tree growth because of changes in utilization standards used in the inventory process.

The change in inventory is illustrated in Figures 3 and 4.

Table 3. Inventory of timber growing stock, Mississippi, selected years.

REGION	1948		1957		1967		1973	
	Soft-wood	Hard-wood	Soft-wood	Hard-wood	Soft-wood	Hard-wood	Soft-wood	Hard-wood
-----Million Cubic Feet-----								
Delta	127.5	910.0	62.6	798.1	69.3	1,198.5	79.0	1,290.4
North	370.4	818.7	412.7	1,017.4	878.0	1,655.5	1,159.0	1,874.4
Central			990.1	898.9	2,028.0	1,520.2	2,187.5	1,655.2
	1,718.4	2,065.7						
Southwest			701.6	769.9	1,391.8	1,082.5	1,641.4	1,187.4
South	1,114.6	567.0	1,146.3	791.4	2,187.7	1,073.1	2,066.3	1,034.4
TOTALS	3,330.9	4,361.4	3,313.3	4,275.7	6,554.8	6,479.8	7,133.2	7,041.1

Sources: *Mississippi Forest Resources and Industries, 1951*; *Mississippi Forests, 1958*; *Forest Resources of Mississippi, 1969*; *Midcycle Evaluation of Mississippi Timber Resources, 1973*; All published by USDA, Forest Service SO. For. Exp. Sta. New Orleans, LA.

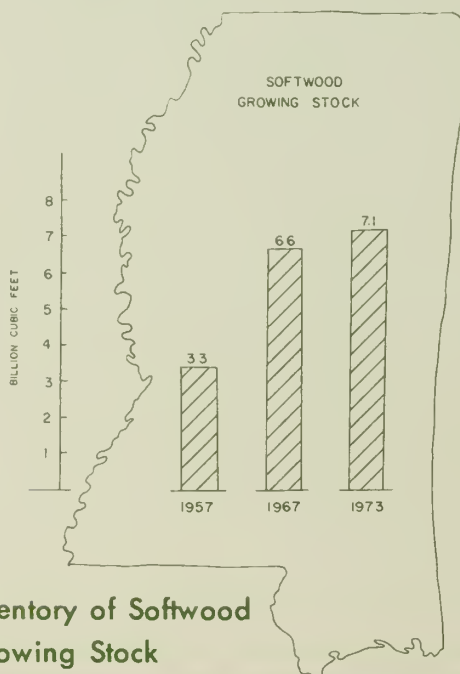


Figure 3. Inventory of Softwood Growing Stock

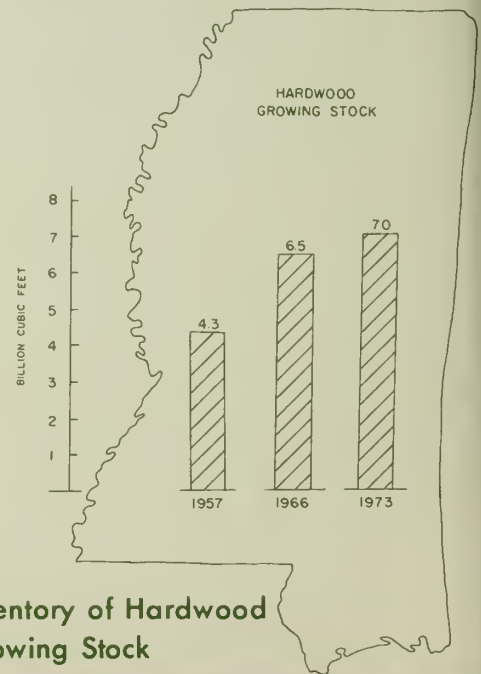


Figure 4. Inventory of Hardwood Growing Stock

Timber Growth and Removal

Table 4. Growth of and removals from growing stock, Mississippi, selected years.

DATE	SOFTWOOD		HARDWOOD	
	Growth	Removals	Growth	Removals
-----Million Cubic Feet-----				
1956	333.4	198.4	269.0	279.0
1966	523.8	251.2	349.7	287.3
1972	453.9	428.1	321.7	272.1

Growth and Removal patterns have been different for softwoods and hardwoods (Table 4). Softwood removals were 59 percent of growth in 1957, declined to only 48 percent in 1966, but jumped to 94 percent in 1972 as a result of the rapid increase in softwood used by industry from 1966 to 1972. Public agencies and the forest industry became concerned about this situation and joined in an effort that led to passage of the Forest Resource Development Act in 1974. This Act doubled the timber "severance" tax and the increase in revenue now goes to implement the Forest Resource Development program. The Act provides cost-share funds to timberland owners for performing specified forestry practices (Miss. Legislature, 1974).

Hardwood removals were 10 million cubic feet above growth in 1957, dropped to 63 million cubic feet below growth in 1966, and were 50 million cubic feet below growth in 1972.

The present growth-removal balance is cause for real concern because current stocking is only slightly above one-half that considered desirable for best production in natural stands.

Growth-Removal comparisons are illustrated in Figures 5 and 6.

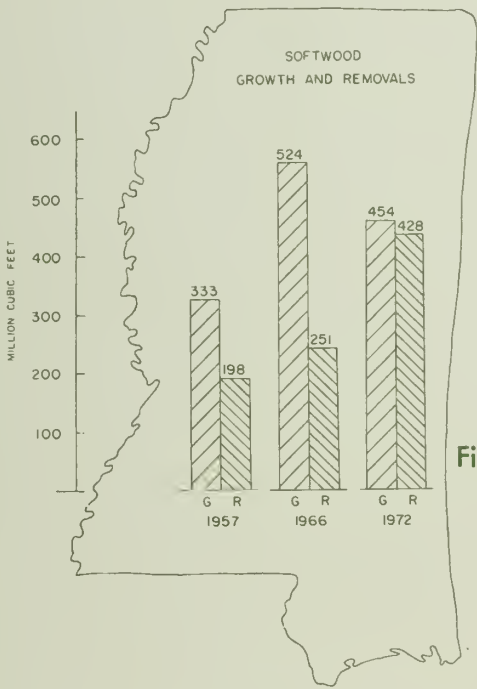


Figure 5. Annual Growth (G) and Removals (R) of Softwood

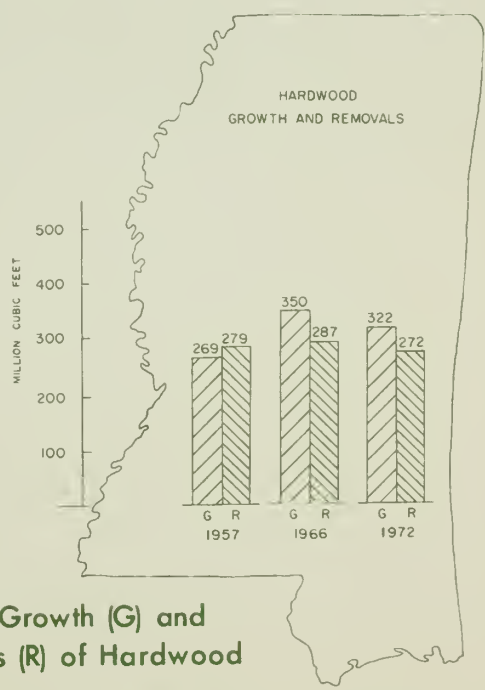


Figure 6. Annual Growth (G) and Removals (R) of Hardwood

Employment

Table 5. Estimated employment in timber-based economic activities, Mississippi, selected years.

Item	1954	1958	1968	1973
	-----Number-----			
Forest Management	2,200	2,500	1,997	4,924
Harvesting	26,450	15,550	10,138	12,311
Manufacturing	32,450	31,150	38,095	39,225
Construction, Transportation and Marketing	10,350	12,500	14,017	17,635
STATE TOTALS	71,450	61,700	64,227	74,095

Note: 1954 and 1958 data from: Hair, Dwight. 1963. The economic importance of timber in the U.S., U.S.D.A. Misc. Pub. No. 941. 1968 and 1973 data computed by the author from Mississippi Employment Security Commission data and by using employment ratios from Hair (1963). See Appendix for details.

Activities associated with growing, harvesting, processing, and marketing timber products always have provided employment for large numbers of Mississippians. More than two-thirds of the workers employed by industry in 1925 were in timber industries. Total employment attributed to timber was 68,000 in 1946, increased to over 71,000 in 1954, fell to some 62,000 in 1958, climbed to over 64,000 in 1968, and was over 74,000 in 1973 (Table 5). At that time 18 percent of all manufacturing employment in Mississippi was in wood-based plants.

Figure 7 shows percentages for each sector.

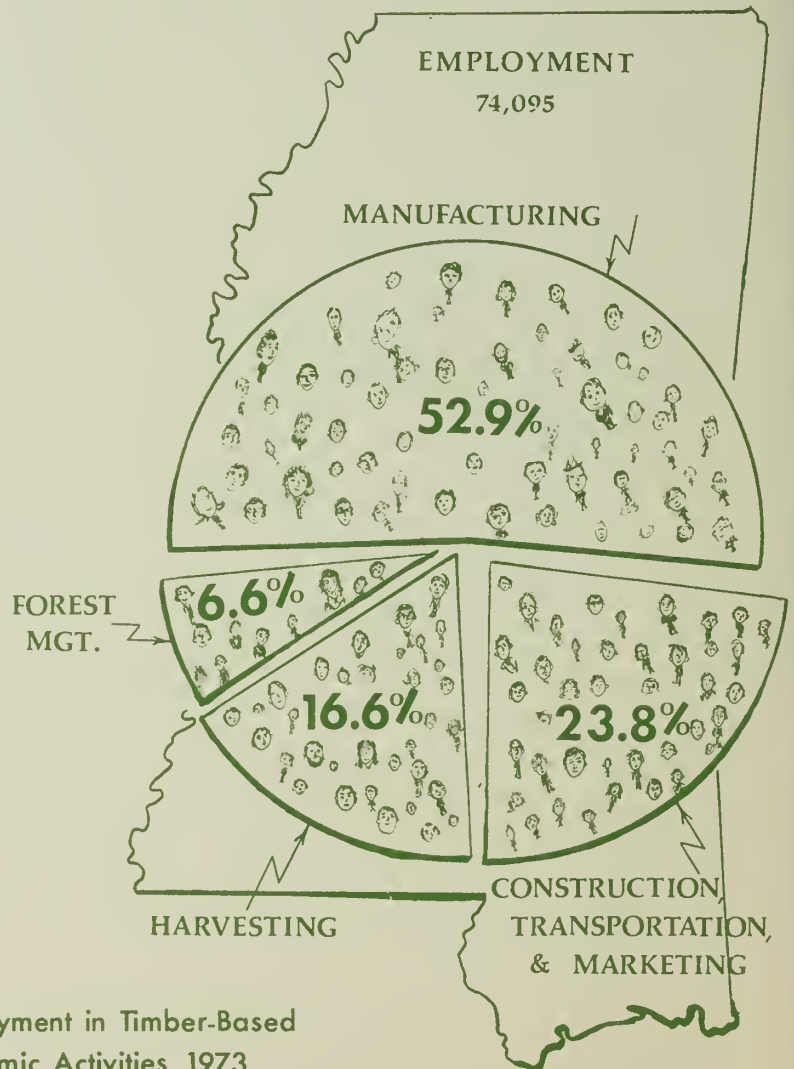


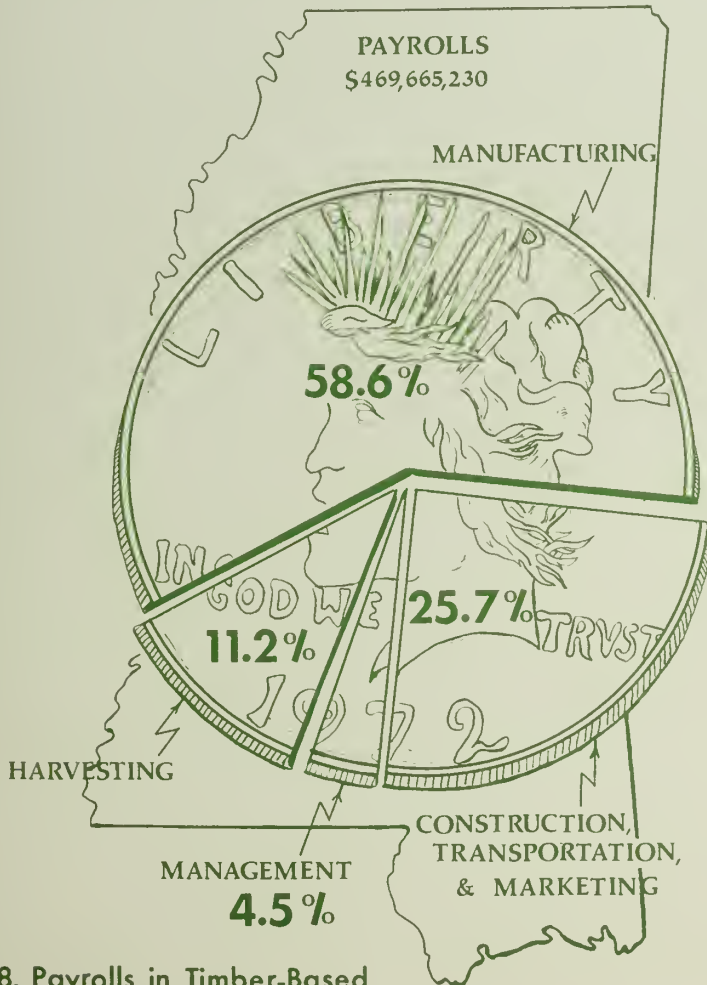
Figure 7. Employment in Timber-Based Economic Activities, 1973

Table 6. Estimated payrolls in timber-based economic activities, Mississippi, 1968 and 1973.

Item	1968	1973
	-\$-	-\$-
Forest Management	11,695,000	21,043,000
Harvesting	37,958,000	52,777,300
Manufacturing		
Lumber and wood products	100,681,000	154,566,800
Furniture and fixtures	26,300,000	48,362,700
Paper and allied products	52,271,000	72,131,600
Miscellaneous	19,484,000	—
Sub-Total	198,736,000	275,061,100
Construction, Transportation and Marketing	69,509,000	120,783,100
STATE TOTAL	317,898,000	469,664,500

Source: 1968 figures from Moak (1971), those for 1973 computed by procedures as outlined in the Appendix.

Payrolls



Most opportunities for non-farm cash wages were in the harvesting and processing of timber when lumbering first came to Mississippi. Probably two thirds of all industrial payrolls in the 1920's came from this source. Payrolls in 1946 were estimated at 200 million dollars, rose to 318 million in 1968, and climbed to 470 million in 1973 (Table 6).

Percentages for each sector are illustrated in Figure 8.

Figure 8. Payrolls in Timber-Based Economic Activities, 1973

Value Added

Table 7. Value added that can be attributed to timber-based activities, Mississippi, selected years.

Item	1954	1958	1968	1973
-----Thousands of Dollars-----				
Forest Management	33,150	25,300	53,708	118,352
Harvesting	64,450	42,850	62,619	119,510
Manufacturing	175,050	166,550	395,007	659,526
Construction, Transportation & Marketing	48,200	66,000	106,429	136,245
STATE TOTALS	320,850	300,700	617,763	1,033,633

Note: 1954 and 1958 data from: Hair, Dwight. 1963. The economic importance of timber in the U.S., U.S.D.A. Misc. Pub. No. 941. 1968 and 1973 data computed by the author from Annual Reports, Mississippi Employment Security Commission, Jackson, MS., and from the 1972 Census of Manufacturers projected to 1973. (See Appendix for details).

Value added that can be attributed to timber-based activities in Mississippi has increased greatly since the 1940's. It was over \$300 million in 1954, maintained this level in 1958, climbed to \$618 million in 1968, and was well over one billion dollars in 1973 (Table 7).

Sector percentages are shown in Figure 9.

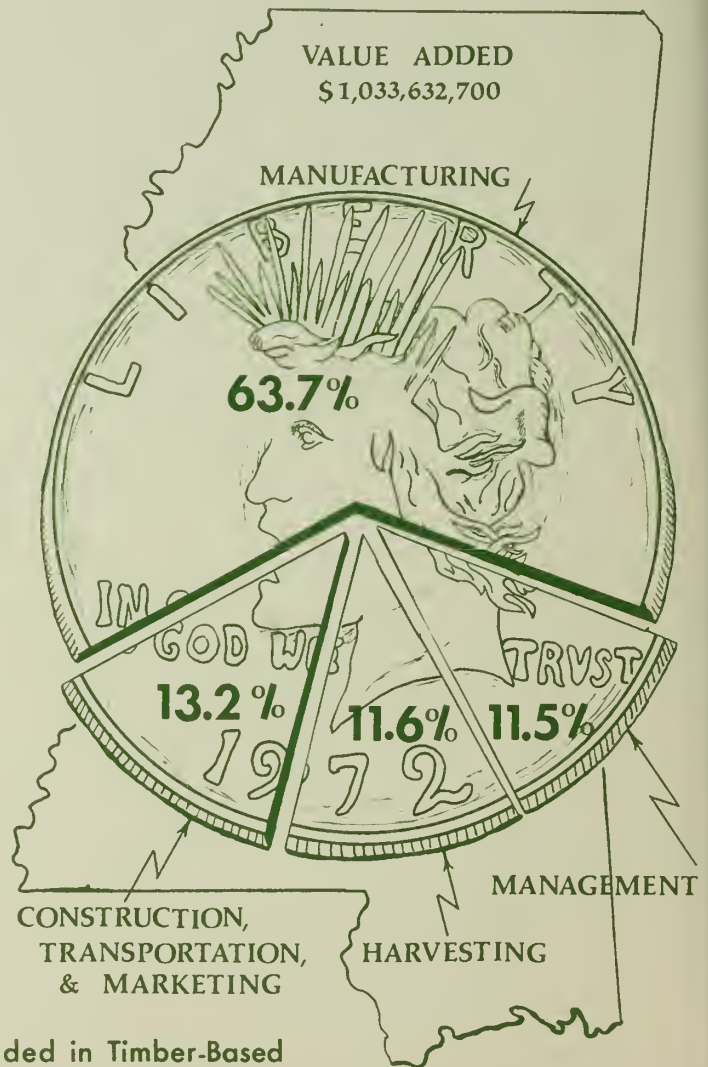


Figure 9. Value Added in Timber-Based Activities, 1973

Manufacturing

Manufacturing of wood products is one of the top manufacturing industries in the state. Comparisons by major components of the industry reveal that lumber and wood products contribute more to annual payrolls in Mississippi than the production of paper and allied products and the manufacture of furniture (Figure 10). The same relationship exists for value

added in manufacture (Figure 11). However, value added per worker in the pulp and paper industry is more than 1½ times that in the solid products industry.

Furniture manufacturing also contributes substantially to value added in Mississippi---over 48 million dollars in 1968, over 100 million in 1973.

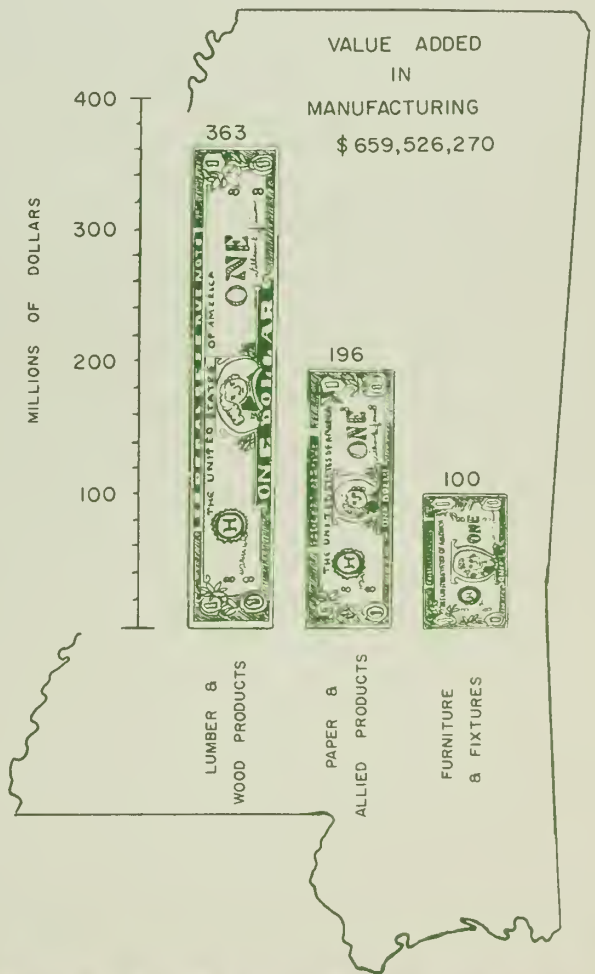
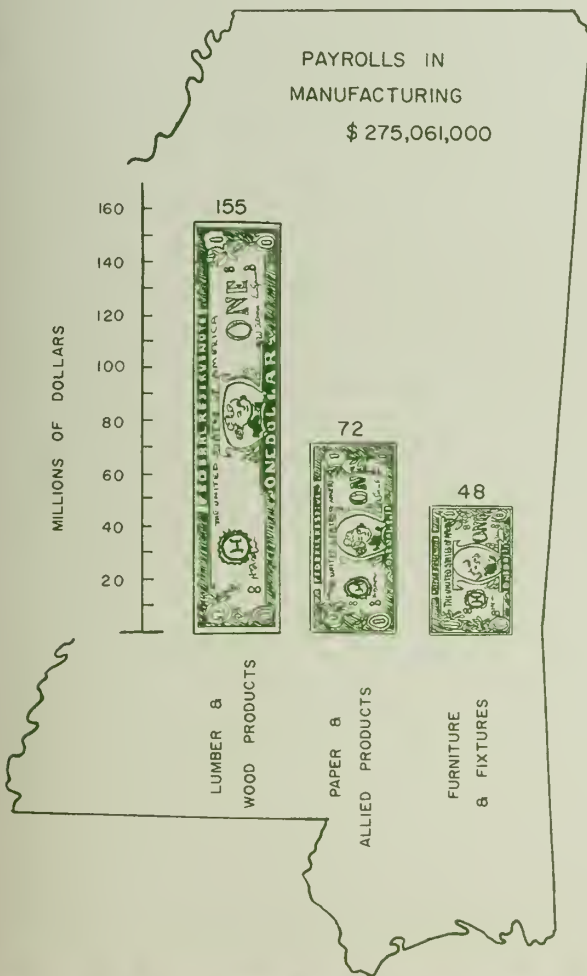


Figure 10. Payrolls in the Manufacture of Timber-Based Products, 1973

Figure 11. Value Added in the Manufacture of Timber-Based Products, 1973

Appendix

Procedure for estimates in the report

Employment in forest management activities---Computed from state and federal agency figures, Miss. Directory of Foresters, personal contacts, and by estimating activities of nonindustrial forest landowners. The 135,000 nonindustrial owners were estimated to have spent 3½ days per year in management of their forests---protection, inspection and other activities, including timber sales.

Employment in harvesting---Computed by dividing productivity estimates for pulpwood, sawtimber, and miscellaneous products into total cut as reported in the 1973 Mississippi Severance Tax Report. Productivity per man year for pulpwood was estimated to be 540 cords, for sawlogs 320,000 board feet.

Employment in Manufacturing---Number of covered employees was computed as follows: Number reported by Mississippi Employment Security Commission for 1973 in SIC Code 24 (lumber and wood products), less those reported for logging camps, plus 55 percent of those reported in SIC Code 25 (furniture and fixtures), plus those reported in SIC Code 26 (paper and allied products).

Employment in Construction, Transportation, and Marketing---Estimated by applying sector ratios to total employment reported by the Mississippi Employment Security Commission for 1973. Ratios developed from procedures used by Hair (1963) and adjusted to Mississippi conditions for 1968 as reported by Moak (1971). Employment in timber-related activities

was 22 percent of total employment in construction, 11.3 percent in transportation, and 4.4 percent in marketing.

Payrolls from Forest Management Activities---The sum of estimates obtained from State and Federal land management payrolls, payrolls of primary and miscellaneous industry, earnings of consultants, and the value of nonindustrial landowners' time at \$1.50 per day.

Payrolls from Harvesting Activities---The product of total number of workers in harvesting multiplied by wages equivalent to these reported in the Mississippi Employment Security Commission annual report for 1973 for SIC Code 241 (logging camps).

Payrolls from Manufacturing---Taken from the 1973 Mississippi Employment Security Commission report of payrolls for SIC Code 26 (paper and allied products), SIC Code 24 (lumber and wood products), and using 55 percent of payrolls reported in SIC Code 25 (Furniture and fixtures).

Payrolls From Construction, Transportation and Marketing---Estimated as follows: timber payrolls in 1968 (Moak, 1971) expressed as a percentage of total payrolls reported by the Mississippi Employment Security Commission for 1973. Ratios reported above for estimating number of workers in construction, transportation and marketing were used to compute payrolls for these sectors.

Value Added in Forest Management---Considered to be equal to stumpage value. Stum-

page value estimated by applying prices to volume cut reported by Timber Severance Tax Division, State Tax Commission, Jackson, Mississippi. Stumpage prices derived from U.S.D.A. misc. publication #1239, The Demand and Price Situation for Forest Products, the Mississippi Forestry Commission Reports and information provided by U.S. Forest Service personnel, Jackson, Miss., and from personal contacts with buyers and sellers. Pine sawtimber was valued at \$80.90 per thousand board feet, hardwood sawtimber \$40.00 per thousand board feet, pine pulpwood \$6.50 per cord, and hardwood pulpwood \$4.25 per cord.

Value Added in Harvesting---Estimated by adjusting value of timber delivered to first buyers in 1973 by the relationship of value added by harvesting to value of shipments as reported by Census of Manufacturers for 1972 in SIC 241 (logging camps and logging contractors).

Value Added in Manufacturing---Computed for 1973 by taking Mississippi Employment Security figures for payrolls, adjusted to that attributed to timber, and then applying the factor, dollars of value added per dollar of payroll reported in the 1972 Census of Manufacturing.

Value Added in Construction, Transportation, and Marketing---Estimated by applying a ratio to the 1973 payrolls computed for this report. This ratio is the composite developed from ratios reported by Hair (1954 and 1968) and Moak (1971).

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