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# FARMING OPPORTUNITIES IN MISSOURI PROJECTED THROUGH 1975

With Special Attention to Openings for High School  
Graduates in Vocational Agriculture.

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# Chapter I

## VOCATIONAL AGRICULTURE IN A CHANGING ECONOMY

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### THE PROBLEM

Dynamic changes are occurring in Missouri's agricultural economy. Workers in the vocational training program in this field are hard-pressed to keep the curriculum consistent with the demands of the society that is being served. The study reported in this bulletin was designed to determine the number of farming opportunities that will become available in Missouri by economic areas through 1975. An effort was made to answer the following specific questions:

1. What changes will be made in the acreage devoted to commercial agriculture?
2. What changes will take place in the number of commercial farms?
3. What changes will occur in the number of adequate-income farms?<sup>1</sup>
4. How many entry opportunities will become available on adequate-income farms during each quinquennial period?
5. What proportion of rural-farm males reaching age 20 will be able to find an opportunity to operate an adequate-income farm?
6. How do enrollments in vocational agriculture compare with expected entry opportunities?

<sup>1</sup>Throughout the study "adequate-income farms" shall refer to those the Bureau of the Census included in Economic Classes I, II and III. These farms had gross agricultural sales of \$5,000 or more in 1954.

\*Portions of this bulletin are taken from a manuscript by Earl T. Carpenter entitled *A Projection of Farm Opportunities in Missouri to 1975*, submitted as a Doctor of Education dissertation at the University of Missouri, June 1960. Edited by Dr. Frank Miller, professor, Department of Agricultural Economics, University of Missouri.

## Need for the Study

The U. S. Department of Agriculture reported some of the significant changes that have been occurring in agriculture in a recent bulletin.<sup>2</sup> One of the most striking of these trends is the number of persons supported by a farmer. In 1840 one farm worker supported only 3.95 persons; by 1958 he supported 23.55 persons.<sup>3</sup> Even more significant is the acceleration in the rate of this change. More than one-half of the increase has occurred since 1944, and more than one-fourth since 1954. Clearly, this increased efficiency is a result of causes which are wielding an impact on resource allocation to individual farmers with an ever-increasing force.

Clues as to the cause of this increased efficiency are found in data that show average use of resources per unit of farm output.<sup>4</sup> Index numbers with 1935-1939 as a base show that by 1958 use of fertilizer had increased to 289, tractors to 236, trucks to 192, and purchased feed to 216. During the same period land used for crops decreased 41 percent and horses and mules per unit of output 87 percent. These changes characterize the influence of technology in agriculture. The result has been a great over-all increase in the capital requirements in farming.

While precisely comparable data are not available by states, it is evident that Missouri's agriculture is being affected similarly. For example, the Census of Agriculture<sup>5</sup> shows that farm tractors increased in Missouri from 7,889 in 1920 to 45,155 in 1940 and to 183,105 in 1954. In this case, more than one-half of the increase occurred after 1945 and more than one-fourth after 1950.

Changes of these magnitudes must influence the workers in an industry. Occasionally, workers will become more prosperous when technology is used to lower unit costs and increase production. For this to happen, however, it must be possible to expand the market for the industry's products. In the case of agriculture, market expansion has not kept pace with its capacity to produce; and, in the opinion of most agricultural economists, in spite of a great population increase in the United States and the fact that continued adoption of technology has tended to keep progressive farmers prosperous, many operators for various reasons have failed to adopt new technology and are in very unfavorable economic positions. Evidence of this fact takes many forms, including migration from the land, low-incomes on farms, and off-farm work by one or more members of farm families to supplement income from the farm business.

These symptoms of the farm problem have received the attention of social and political leaders for some time. Since 1929, American society has shown its concern by providing direct economic aid to farmers. Shepherd estimated that

<sup>2</sup>U. S. Department of Agriculture, *Agricultural Outlook Charts: 1959*. (Washington: Government Printing Office, 1958), p. 66.

<sup>3</sup>This is a preliminary figure for 1958. It compares with 21.92 in 1957.

<sup>4</sup>U. S. Department of Agriculture, op. cit., p. 63.

<sup>5</sup>U. S. Bureau of the Census, *Census of Agriculture: 1954*, Vol. I, Counties and State Economic Areas, Part 10. (Washington: Government Printing Office, 1956), p. 16.

the total realized cost of farm programs to stabilize prices and farm income was about 10 billion dollars between 1932 and 1955. He says the measures that have been applied have not worked. Farm programs should have been directed toward helping farmers make adjustments to new types of economic forces; prices of farmers' products, however, have received the attention. Through capitalization of governmental benefits into increased land values, farm people are possibly no better off than they would have been without the assistance.<sup>6</sup>

*The Basebook for Agricultural Adjustment in Iowa*,<sup>7</sup> which was prepared by members of the Iowa State University staff, repeatedly emphasizes in all three of its parts that agricultural adjustment requires a reduction in the number of farmers. Heady, in discussing increased labor efficiency, says:

. . . it makes little sense to free labor and leave it stranded in agriculture. Investment in technical improvements must be accompanied by greater investment in services which aid the transfer of labor freed from agriculture. The adjustment is already taking place, but it is not taking place rapidly enough to keep resource returns and family incomes in line with those of other industries.<sup>8</sup>

Later in the same article he adds:

*Agriculture is a competitive industry. It will continue to be so, and farming can be conducted profitably only by those who have the proper abilities, skills and capital. As in the past, we need to maintain a flow of information to operators who will or should remain in farming. We need to properly train the youth who will take their place. (But) we need to intensify a parallel effort which helps agriculture adjust in numbers of farms, quantity of labor and general resource structure; and to allow those remaining to have favorable incomes.*<sup>9</sup>

Ball discusses lack of knowledge as a factor which influences agricultural adjustment as follows:

Another place where lack of knowledge retards adjustment or causes maladjustment in agriculture is in the whole area of alternative and comparative non-farm opportunities that exist for some or all of the resources used in farming. A farmer who does not realize the employment opportunities, requirements, availability and rewards for himself or members of his family in non-farm occupations cannot consider these when making decisions. He will regard his activities as entirely or mostly farm oriented and will tend to regard all others as only remote or entirely impossible.<sup>10</sup>

These writers have suggested the importance of removing some of the workers from agriculture. Sheppherd is more specific in suggesting who should go:

<sup>6</sup>G. S. Sheppherd, "Have Agricultural Programs Contributed to Long-Run Agricultural Adjustments?" *A Basebook for Agricultural Adjustment in Iowa*, Part III. Special Report No. 22, Iowa State College, Ames, October 1957. p. 5.

<sup>7</sup>*A Basebook for Agricultural Adjustment in Iowa*, Part I, II, and III. Special Reports No. 20, 21 and 22, Iowa State College, Ames, October 1957.

<sup>8</sup>Earl O. Heady, "Nature of the Agricultural Adjustment Problem", *A Basebook for Agricultural Adjustment in Iowa*, Part I. Special Report No. 20, Iowa State College, Ames, October 1957. p. 20.

<sup>9</sup>*Ibid.* p. 21.

<sup>10</sup>A. Gordon Ball, "Factors Influencing Agricultural Adjustment", *A Basebook for Agricultural Adjustment in Iowa*, Part I. Special Report No. 20, Iowa State College, Ames, October 1957. p. 31.

. . . but the pathway for farm boys and girls who decide for themselves that they can do better in urban jobs should be made as smooth and open as possible. "Farm boys and girls" are mentioned deliberately. By all odds—from an economic, sociological and psychological point of view—the easiest and most sensible time for a farm-raised boy or girl to move off the farm is before becoming established in farming. . . .

The solution is to bring the whole problem of the continuing surplus of farm boys and girls to the attention of farm boys and girls early in their high school careers; to keep them posted on the kinds of non-farm jobs and careers available; to provide them with the opportunity to choose training for non-farm jobs as well as for farm jobs. Those who do decide they want to move to a non-farm job may thus have the opportunity to get the kind of training needed for that job before applying for it. This would avoid some of the economic friction which retards farmers already established in farming from moving into non-farm jobs.<sup>11</sup>

Heady indicates his agreement when he writes:

The adjustments required and the activities which will facilitate them are complex. They must revolve largely around the more flexible, adaptable part of the farm labor force; namely, farm youth . . . Balance can be facilitated by aiding farm youth when their incomes and life satisfaction will be greater in some other occupation, to enter that occupation rather than entering agriculture. We provide a positive service to these persons by training, informing and counseling them so that they make correct choices when they enter the labor force. We provide them a disservice if we encourage or allow them to enter farming—only to find out 4 or 5 years later that they have made a mistake and should switch from farming.<sup>12</sup>

Timmons adds this:

Although people of all ages migrate from farms, the high school and immediately following high school age groups provide the greatest possibilities for migration. It appears that efforts to facilitate further movement off farms should be directed toward this segment of the farm population through (1) providing training for non-farm occupations, (2) providing the nature of opportunities in farming and other occupations for youths to consider, and (3) helping youth to obtain non-farm employment or further training for non-farm occupations.<sup>13</sup>

These agricultural economists and rural sociologists from Iowa State University have made a strong case for the types of vocational guidance and vocational education that meet the needs of farm youth. In a preliminary report of a regional study on this subject, Kanel takes a similar stand:

The legitimate matter of public concern is that individuals be provided with adequate knowledge of their opportunities in different occupations, that they have the opportunity to receive as good an education as they are capable of absorbing, and when needed, that they be aided in finding, in training for, and in transferring to, new occupations.<sup>14</sup>

<sup>11</sup>G. S. Sheppherd, *op. cit.*, p. 8.

<sup>12</sup>Earl O. Heady, *loc. cit.*

<sup>13</sup>John F. Timmons, "Agriculture's Capacity to Adjust", *A Basebook for Agricultural Adjustment In Iowa*, Part I. Special Report No. 20, Iowa State College, Ames. October, 1957. p. 27.

<sup>14</sup>Don Kanel, "Opportunities for Beginning Farmers, Why are They Limited?" North Central Regional Publication, University of Nebraska, Lincoln. Preliminary Report, May 1959. p. 31. (Mimeographed)

He further states:

If technology and farm efficiency require fewer and larger farms, the least painful reduction in farm numbers will come about by having fewer young families start in farming, rather than through the uprooting of older families already engaged in farming.<sup>15</sup>

These Iowa and Regional manuscripts report some of the most significant studies of the adjustments needed in agriculture to date. The authors emphatically agree that the solution to the farm problem is centered around orderly migration of youth into more rewarding urban endeavors. Missouri's agriculture is subject to the same general influences that caused these writers to reach their conclusions. Clearly, there is need to study farm entry opportunities and to provide the farm youth of the state with realistic information regarding their chances in farming.

### Status of the Problem

The vocational guidance movement has stimulated interest in occupational information that would give youth and adults accurate facts about the occupations for which they are best fitted, and which, if used, would offer the individuals the greatest opportunity to serve themselves and society. From this movement has come a great array of information concerning the national employment situation. To a lesser extent, data have been available concerning occupational opportunities at regional, state and local levels. Specific information of this sort has been cited as a major need in the field of vocational guidance.

Attempts to determine the future number of opportunities to farm, however, are yet in the pioneering stages. Joslyn<sup>16</sup> of Iowa was the first to undertake this task comprehensively at the state level. The existence of his study did much to encourage this one. In his work, Joslyn made the following assumptions:

1. The rate of technological change will be similar to that of the 1945-55 decade.
2. A peace-time, full-employment economy will prevail.
3. Acres in commercial farmland will decrease as non-agricultural uses increase.
4. The beginning age of farmers is 20 years.
5. Farmers will retire at age 65.
6. Rural-farm males constitute the demand for farming opportunities.
7. Rural-farm males in Iowa have the same life expectancy as all farm males in Iowa.
8. The age distribution within five-year age groups is equal.
9. By 1975, all commercial farms will be re-organized in such a manner that there will be a minimum of \$10,000 gross income per farm.

<sup>15</sup>*Ibid.* p. 34.

<sup>16</sup>Kenneth H. Joslyn, "Factors Affecting Future Farming Opportunities" (unpublished Master's thesis, Iowa State College, Ames, 1958).

10. The number of part-time farms and rural residences is directly related to the size of the urban population.

Using these assumptions, Joslyn calculated future acreages of farmland, sizes of operating units, number of farms, and finally, the number of opportunities to become available. He then anticipated changes in the rural-farm-male population under 20 years of age to indicate the extent of imbalance between the supply of and demand for these opportunities.

While attempting to refine some of Joslyn's methods and to re-evaluate some of his assumptions, the general attack upon the problem in this study has been similar. The assumptions concerning extent of re-organization of commercial farms and the future course of part-time and residential farming did not seem to be consistent with trends in Missouri, and therefore, were not used.

#### METHOD OF STUDY

To predict future happenings has long challenged humanity. In many fields scientists have searched for accurate predictive criteria; in some fields they have made significant strides. Few studies similar to this one have been made; therefore, a major share of the effort has been directed toward the identification of promising criteria for predicting future numbers of farming opportunities. The work did not lend itself to immediate, precise, statistical evaluation. The guiding hypothesis was that an evaluation of trends in number and size of farms would reveal a basis for predicting the future supply of farming opportunities in Missouri. Certain phases of the predictions have been tested subjectively by rationalization. The estimates appear reasonable, but the final test of their accuracy will occur when results of the 1975 Census of Agriculture are released.

#### Sources of Information

While the study by Joslyn was regarded as the only previous investigation directly related to this one, many reports were helpful in developing the assumptions. Particularly valuable were the reports of the U. S. Department of Agriculture on number and size of farms.

Most of the statistics have been taken from publications of the Bureau of the Census which include: (1) *United States Census of Agriculture*,<sup>17</sup> (2) *United States Census of Population*,<sup>18</sup> and (3) *Farms and Farm People*.<sup>19</sup> Migration data were taken from Gladys K. Bowles' report on *Net Migration From the Rural-Farm Population, 1940-50*.<sup>20</sup> In figuring death rates, *Vital Statistics, State of Mis-*

<sup>17</sup>U. S. Bureau of the Census, *U. S. Census of Agriculture: 1954*. Vol. I, Counties and State Economic Areas, Part 10, U. S. (Washington: Government Printing Office, 1956).

<sup>18</sup>U. S. Bureau of the Census, *U. S. Census of Population: 1950*. Vol. II, Characteristics of the Population, Part 25, Missouri, (Washington: Government Printing Office, 1952).

<sup>19</sup>U. S. Bureau of the Census, *Farms and Farm People: Population, Income and Housing Characteristics by Economic Size of Farm* (Washington: Government Printing Office, 1953).

<sup>20</sup>Gladys K. Bowles, *Net Migration From the Rural-Farm Population, 1940-50*, Agricultural Marketing Service, U. S. Department of Agriculture, Statistical Bulletin No. 176 (Washington: Government Printing Office, 1956).

*souri: 1950* were used as a guide.<sup>21</sup>

Preliminary unpublished data of the Missouri portion of the National Inventory of Soil and Water Conservation Needs were used to estimate changes in acreage of farmland. This information was made available by the State Committee that assembled the estimates.

Enrollment of seniors in vocational agriculture was taken from the Preliminary Report of Vocational Agriculture in the office of the State Director of Vocational Agriculture, Division of Vocational Education, Jefferson City, for each school offering work in this field.

## Procedure

Selecting the most promising factors for calculating the future extent of farming opportunities and the demand for these opportunities was the principal concern of the study. After a scheme was formulated for making the estimates, the mathematical computations and tabulations usually were quite simple, although often time consuming. Whenever possible, checks were built into the calculating procedures; in other instances, the work was repeated to assure accuracy.

In brief, the procedure used was as follows:

1. Determining the number of adequate-income farms.
  - a. The acreage of farmland available for commercial agriculture was projected to 1975 using the rate of change anticipated in the survey conducted by the Committee on Soil and Water Conservation Needs.
  - b. The average-size farm was projected to 1975 based on the 1950-55 trend.
  - c. The number of farmers in each projection period was determined by dividing the acreage by the average-sized farm.
  - d. The number of adequate-income farms was calculated from the trend in the increase in these farms as a percent of all commercial farms from 1950-55.
2. Determining the number of adequate-income opportunities to become available.
  - a. An age distribution was assumed for adequate-income farmers, and all were assumed to retire upon reaching 65 years of age.
  - b. Death rates based upon 1950 data for the male-white population in Missouri were applied to determine the number of deaths expected.
  - c. Changes in the number of adequate-income farms were determined from one five-year period to the next.
  - d. The sum of retirements and deaths plus or minus the change in the number of farmers was regarded as the total number of opportunities.

<sup>21</sup>Bureau of Vital Statistics, Division of Health, *Vital Statistics, State of Missouri: 1950* (Department of Public Health and Welfare, Jefferson City).

3. Estimating the demand for farms by rural-farm youth.
  - a. The number of rural farm males under age 20 was taken from the 1950 Census by five-year age groups.
  - b. Death rates based on the male-white population for these ages were applied to determine the expected reduction due to deaths.
  - c. Migration rates based on that occurring between 1940-50 were applied by age groups to indicate the number of migrants.
  - d. The remaining rural-farm males reaching age 20 were regarded as the potential demand.
- IV. Estimating the imbalance.
  - a. Entry opportunities were compared with the number of rural-farm males reaching age 20.
  - b. Comparisons were also made between numbers of 15-19 year-olds and placement opportunities.
  - c. The number of seniors enrolled in vocational agriculture was compared with the total number of entry opportunities.
  - d. The number of seniors was also compared with the number of opportunities likely to become available to former students of vocational agriculture.

### Evaluation of Results

It was possible to analyze, subjectively, some of the findings of this study by comparing them with other facts and evidences of facts. In certain instances, it was quite obvious that the method was not entirely satisfactory. To the extent that it was possible to identify them, these inadequacies were treated in the summaries of particular sections and in the concluding section.

### Treatment of Findings

The analysis was made by economic areas as defined and used in the Census of Agriculture. In many instances, the basic data needed for the analysis were available in the Census reports.

Figure 1 shows the nine economic areas of Missouri with Areas 2 and 9 divided into sub-areas. Metropolitan Areas A and B, also are shown on the map. Area A includes Jackson County, and B St. Louis and St. Charles Counties and the City of St. Louis. Since the Census included Area A with Area 1, and Area B with Area 6 in their tabulations, the same procedure was followed in this study.

In the bulletin, *Rural-Urban Population Change and Migration* in Missouri, 1940-1950,<sup>22</sup> these areas were described as follows:

*Area 1*, in the northwest, has the highest rural living levels in the State. Livestock and livestock products are the chief sources of income. The pro-

<sup>22</sup>Robert L. McNamara, Peter New and Donnell Pappenfort, *Rural-Urban Population Change and Migration in Missouri: 1940-1950*, College of Agriculture, University of Missouri, Bulletin 620. Columbia, 1954. pp. 4-5.

duce sold in this area accounts for nearly 20 percent of the State total value of farm products sold or used.

*Area 2*, situated in the northern part of the State and subdivided into Areas 2a and 2b, is predominantly livestock country; although corn is the chief product in the western section. Farms are well mechanized and the rural levels of living fairly high.

*Areas 3*, in the southwest, has mixed farming with wheat predominant in the western section (prairie country). Cattle and corn are raised in the rest of the area. The rural level of living in Area 3 is well above the State average.

*Area 4*, in the southwest corner of the State, has a large dairy industry with one-third of all dairy farms in the State. The rural living level is about equal to the average for the State.

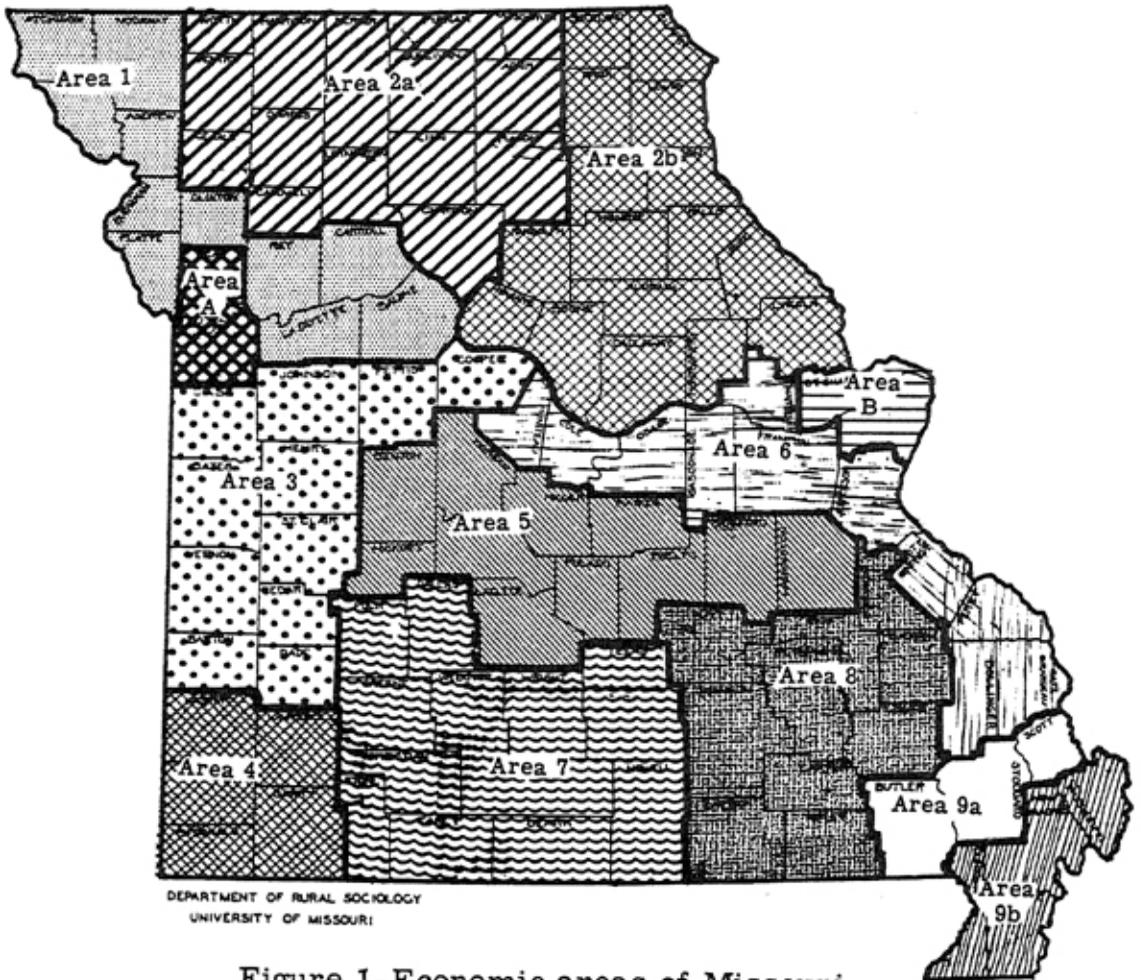


Figure 1-Economic areas of Missouri

*Areas 5 and 6*, in the central-southeast portion of the State contain a large number of livestock farms. The income from sale of livestock and livestock products accounts for 90 percent of all products sold. The rural levels of living are relatively low.

*Area 7*, in the south, is another major dairy producing section of the State with about one-third of all dairy farms centering in the western part. Area 7 has the highest value of dairy products sold of any region in the State. A large number of unclassified farms are located in the eastern part. The rural level of living is about 25 percent below the State average.

*Area 8*, in the south, derives its largest income outside of farming from lead mining. The rural levels of living are lower than in any other economic area and a majority of the farms are unclassified, although there are some livestock farms. The median income of the families of this region is the lowest in the State.

*Area 9*, commonly known as the delta, is divided into a northern and southern part (identified as 9a and 9b). About 12 percent of the population is non-white, which is a higher concentration of non-white farm population than found in any other economic area. There are three times as many tenants and share croppers as owners on farms. Although there are some livestock farms in the northern part, nearly 60 percent of the farmers in this area (9) grow cotton on very fertile land. The rural levels of living are lower than in any other economic area of the State with the exception of Area 8.

The projection period for this study extends to 1975. The span was divided into four five-year intervals beginning with the 1955-60 period. Since the 1954 Census of Agriculture consists of data which were collected in November of that year, it was assumed to be consistent with the 1955 beginning date for these projections.

### Limitations of the Study

The program of vocational agriculture includes education for young and adult farmers as well as for youth in secondary schools. This study was aimed specifically at the number of profitable entry opportunities and thus, applies principally to the high school phase of the program.

There are other occupations which require competencies similar to those of successful farmers. Many part-time and residential farmers, whose numbers are not indicated in this study, may profit from instruction in vocational agriculture. There are also technical and professional jobs in agriculture. Students preparing to pursue these occupations profit from instruction in vocational agriculture. The study did not include benefits to these groups but was restricted to opportunities expected to provide a reasonably desirable level of living from full-time farm employment.

## Definition of Terms

Some of the terms used in the study are defined as follows:

*Commercial Farms.* Those farms selling more than \$250 worth of farm product per year, providing the operators who sold less than \$1200 worth worked off the farm fewer than 100 days. The 1950 and 1954 Census lists the number of these farms, and the number was estimated for the future with a constant price of products assumed. These farms were divided into six economic classes as follows:

<i>Class of farm</i>	<i>Value of farm products sold</i>
I	\$25,000 or more
II	10,000 to \$24,999
III	5,000 to 9,999
IV	2,500 to 4,999
V	1,200 to 2,499
VI	250 to 1,199

*Other Farms.* Those farms not meeting the requirements of commercial farms include the following groups:

*Part-Time Farms.* These are farms with a value of sales of farm products of \$250 to \$1,199 if the farm operator reported (a) 100 or more days of work off the farm, or (b) the non-farm income received by him and members of his family was greater than the value of farm products sold.

*Residential Farms.* This group includes all farms except abnormal farms with a value of sales less than \$250.

*Abnormal Farms.* This group includes public and private institutional units, community enterprises, experiment-station farms, and grazing associations, in so far as the Census was able to determine them.

*Adequate-Income Farms.* These units include farms which are in Economic Classes I, II, and III.

## Chapter II

### ESTIMATING SUPPLY OF FARMING OPPORTUNITIES

For this discussion, farming opportunities have been limited to those expected to yield a gross income of \$5,000 or more and, therefore, are equivalent to Class I, II and III farms as they were classified in the 1950 and 1954 Census. The number of opportunities to become available will depend upon changes in the number of farmers and the number of vacancies which occur on these farms.

Gross sales is not the most satisfactory measure of farm income. Data from the Census have been used in this study because of scope and reliability. Since the Census reported the number of farms by economic classes which were differentiated on the basis of gross sales, it was decided to define a satisfactory farming opportunity in these terms.

In choosing the minimum economic class to be considered an adequate-income farm unit, three apparently reasonable alternatives were available—Class II, Class III, and Class IV. Class I farms grossed \$25,000 or more per year from sales of agricultural products as reported by the Census in 1950 and 1955. Class V and VI farms grossed less than \$2500 per year; if any appreciable amount of expense were involved, they could hardly support a farm family. The reliability of choice between Class II, III and IV farms was not so apparent. Some farm operators have much higher expenses than others, even though the gross income is similar. While some have indicated that net farm income is one-third to one-half of the gross, it is doubtful if these proportions are applicable to all types of farms in Missouri.

It was believed that a family engaged in full-time farming, should receive at least \$2000 which could be applied to family living and savings. Those not receiving this amount would get a more satisfactory living in some other occupation. It seemed doubtful that farmers with much less than \$5000 gross sales would receive such an income. On the other hand, \$10,000 in gross sales may not be required to yield a satisfactory living for the average farm family. Therefore, Class III farms or those with gross sales of \$5000 or more were used to represent the minimum adequate-income farms.

#### CHANGING NUMBER OF ADEQUATE-INCOME FARMS

Since 1929, in spite of the reduction in total number of farms, the number of adequate-income operating units in the United States has increased. McElveen<sup>1</sup> adjusted earlier Census classes of farms to the 1954 Economic Classes. Table I shows that the number of Class I farms nearly tripled, the number of Class II farms nearly doubled, and the number of Class III farms increased substantially between 1929 and 1954. The increase in adequate-income farms amounted to 58.9 percent from 1929 to 1954. During this time, the total number of farms in the United States declined by 24.0 percent.

A continuation of this increase in number of adequate-income farms will depend upon: (1) changes in acreage of farmland used in commercial agriculture, (2) changes in size of farms, and (3) changes in the proportion of adequate-income farms to all commercial farms. Also of interest is the extent of multiple-operatorships, i.e., one farm providing adequate incomes to two or more families.

#### Changes in Acreage of Farmland

The acreage of farmland devoted to commercial agriculture has changed in each Census period. The amount available in the future will be influenced by: (1) The acreage removed by urbanization; (2) expansion of the highway system,

<sup>1</sup>Jackson V. McElveen, *Family Farms in a Changing Economy*, Agricultural Research Service, United States Department of Agriculture, Agricultural Information Bulletin No. 171 (Washington: Government Printing Office, 1957), p. 19.

air ports, and other transportation facilities; (3) development of recreational areas; (4) changes in the status of marginal land; and (5) changes in acreage devoted to part-time and residential farming.

A recent report of the U. S. Department of Agriculture includes predictions, by agricultural workers, of the agricultural land that will be available up to 1975 for each county in Missouri.<sup>2</sup> These data make allowances for development of new land through drainage, clearance, and irrigation and for removals from agricultural uses. While any such predictions are subject to error, the data were regarded as the most reliable of any that were available for use in this study.

TABLE 1  
NUMBER OF FARMS BY ECONOMIC CLASS IN SPECIFIED YEARS  
UNITED STATES 1929-54

Economic Class	Value of Sales (1954 Prices)*	1929	1939	1944	1949	1954
		Thou.	Thou.	Thou.	Thou.	Thou.
<b>Commercial Farms:</b>						
<b>Adequate-Income</b>						
Class I	25,000 & over	47	60	91	103	134
Class II	10,000 - 24,999	205	252	347	381	449
Class III	5,000 - 9,999	560	585	723	721	707
Total		812	895	1161	1205	1290
<b>Low-Income</b>						
Class IV	2,500 - 4,999	1078	1015	976	882	811
Class V	1,200 - 2,499	1274	1070	867	661	536
Class VI	250 - 1,199	1559	1283	937	717	463
Total		3911	3368	2780	2260	1810
<b>Total Commercial</b>		<b>4723</b>	<b>4265</b>	<b>3941</b>	<b>3465</b>	<b>3100</b>
<b>Non-Commercial Farms:</b>						
<b>Part-Time and Residential Subsistence</b>						
	Under 2,500	924	1181	1345	1670	1507
	Under 250	556	504	393	247	175
Total		1480	1685	1738	1917	1682
<b>Non-Commercial Excluded by revised definition</b>		86	147	180	---	---
<b>All census Farms</b>		<b>6289</b>	<b>6097</b>	<b>5859</b>	<b>5382</b>	<b>4782</b>

\*Value intervals in early years deflated to 1954 level of prices received by farmers for farm products.

Source: Jackson V. McElveen, Family Farms in a Changing Economy, Agricultural Research Service, United States Department of Agricultural, Agricultural Information Bulletin No. 171 (Washington: Government Printing Office, 1957)

<sup>2</sup>National Inventory of Soil and Water Conservation Needs.

*Urbanization.* Bogue developed a land conversion formula which he applied to the population projections of the Bureau of the Census. He estimated that a total of 7.4 million acres will be diverted from agricultural to non-agricultural uses between 1955 and 1975. His figures apply to Standard Metropolitan Areas as defined by the Census, and the 7.4 million acres represent 14 percent of the land in these areas.<sup>3</sup> Joslyn used Bogue's method to estimate land conversion in Iowa. His estimates indicated that 93,000 acres would be removed from agriculture by urban development between 1955 and 1975. This figure compares with 33.7 million acres of farmland in commercial farms in Iowa in 1955.<sup>4</sup> Similar urbanization will undoubtedly occur in Missouri with a resultant reduction in farmland.

*Highway Development.* Joslyn<sup>5</sup> estimated that highway development would claim 139,000 acres of farmland in Iowa between 1955 and 1975. The provisions of the Federal Highway Act make it appear certain that Missouri agriculture will be similarly affected. The Missouri Highway Department indicates that in 1948, about 153,000 acres were in the State's highway system. By 1958 the figure had changed to 264 thousand acres and is expected to reach 293,000 by 1975.<sup>6</sup>

*Recreation Area.* Development of recreational areas has seemed to be, at least in part, a function of prosperity. Recent expansion in the area of the Lake of the Ozarks has encompassed considerable land. The Army Engineers, the Missouri State Park Board, The Missouri Conservation Commission, and many local communities have plans for diverting land into lakes, parks, and resorts. It was believed that county agricultural workers, in predicting future land use, made allowances for projects of these types which are likely to remove land from farming. Their data suggest that much of the land to go into recreational use is not good farmland.

*Changes in Status of Marginal Land.* In many Missouri counties, as little as one-half of the total land area was listed by the 1954 Census of Agriculture as "land in farms." This indicates that a considerable acreage, some of which could be brought into agricultural production, was not being farmed at the time of the Census. Since the county committees that took the Conservation Needs Inventory were asked to indicate expected changes in land use, it was assumed that they considered changes in the use of marginal land.

*Part-time and Residential Farms.* The Conservation Needs Inventory included no distinction in the status of farmers using agricultural land. Since the study

<sup>3</sup>Donald J. Bogue, *Metropolitan Growth and the Conversion of Land to Non-Agricultural Uses* (Scripps Foundation Studies in Population Distribution, Number 11. Oxford, Ohio: Scripps Foundation, Miami University) pp. 6-19.

<sup>4</sup>Kenneth H. Joslyn, "Factors Affecting Future Farming Opportunities" (unpublished Master's Thesis, Iowa State College, Ames, 1958).

<sup>5</sup>*Ibid.*

<sup>6</sup>Jack Frizzell, Missouri Highway Commission, Jefferson City, (Private communication).

reported here was concerned only with adequate income farms, it was necessary to make an assumption regarding the amount of land that would be used by non-commercial farmers to arrive at a total acreage of land available for commercial operators.

A total of 4,378,521 acres was included in part-time, residential, and abnormal farms in 1955.<sup>7</sup> This amounted to 12.8 percent of the 34.3 million acres in farms in Missouri. Part-time farmers occupied 7.1 percent of the land in farms, and residential farmers 5.6 percent. Only 0.1 percent of the agricultural land area was in abnormal farms.

Moore and Wayt<sup>8</sup> studied the part-time route to full-time farming in Ohio. They found that, while some farmers do follow this route, others follow the reverse route, from full-time farming to part-time farming and on to retirement or off-farm work. Apparently, the off-farm job often becomes more lucrative than the inefficient farm operation and, when a crisis occurs in the farm operation requiring a new investment, the part-time farmer may sell his business and move to town. Shoemaker<sup>9</sup> has suggested that the automobile wearing out often forces this decision.

By definition, the part-time farmer has a low farm income—\$250 to \$1199 in gross value of produce sold—and, therefore, very likely has an inefficiently organized farm business. To assume an increase in this sort of operation would imply irrational behavior on the part of farmers which is probably not justified. In a Missouri study of machinery investments Wilson concluded that, "It is impractical for farmers who have less than 97 acres of cropland to own full sets of machinery in Missouri Economic Area 8."<sup>10</sup>

Some investigators have suggested that an increase will occur in the amount of part-time farming. For example, Joslyn estimated a 49.8 percent increase in both part-time and residential farms in Iowa between 1955 and 1975.<sup>11</sup> In Missouri, the number of these farmers declined from 29,038 in 1950 to 25,796 in 1955. Because of the increase in average sized farm, however, the acreage in these farms was nearly constant. Since there seems to be a definite economic disadvantage in these farms, no increase in the acreage devoted to them has been assumed in this study.

Evidence stated herein could lead to an assumption of a reduction in the acreage devoted to part-time farming. It was believed, however, that part-time farming would continue to be a method of gradual retirement for many farmers.

<sup>7</sup>U. S. Bureau of the Census, *U. S. Census of Agriculture: 1954*. Vol. 1, Counties and State Economic Areas, Part 10. (Washington, Government Printing Office, 1956) p. 185.

<sup>8</sup>H. R. Moore and W. A. Wayt, *The Part-Time Route to Full-Time Farming*, Ohio Agricultural Experiment Station, Research Bulletin 793, Worster, p. 7.

<sup>9</sup>Karl Shoemaker, "Opportunities and Limitations for Employment of Farm People Within and Outside of Farming", United States Department of Agriculture, Federal Extension Service, Washington, D. C. (Mimeographed) p. 12.

<sup>10</sup>Dale M. Wilson, "An Economic Analysis of the Capital Investment in Farm Machinery in the Ozarks of Southeastern Missouri," (unpublished Master's thesis, University of Missouri, 1960) p. 20.

<sup>11</sup>Joslyn, *loc. cit.*

No doubt large numbers of workers will also continue these operations simply because of their preference for farm life.

In 1955, a total of 35,520 Missouri farms were classified as residential by the Census of Agriculture. This was a slight decrease from the 36,280 reported in 1950.<sup>12</sup> The term "residential farm" seems to imply a home in the country, and an increase in number could be anticipated with an increase in general prosperity throughout the economy. Certainly, city people with good incomes do increase the demand for farmland effectively. It has been observed that many of them have residences in the country. However, this type does not constitute the majority of residential farmers. Ducoff showed that 12.5 percent of the residential farmers were wholly dependent upon agriculture for their income in 1950, even though their gross sales amounted to less than \$250. He showed that another 9.3 percent were dependent upon agriculture for the major source of income.<sup>13</sup>

So, while residential farms include country homes for some prosperous urban workers, a large number of very low-income farmers are also included. It is likely true that urban workers will continue to buy farmland for country homes; however, low-income farmers will continue to exist in the rural-residential group.

In this study it has been assumed that the acreage devoted to residential, abnormal, and part-time farming will remain at a constant percentage of that used in commercial agriculture to 1975. This assumption was consistent with the acreage devoted to these farms in the Census of 1950 and 1955.

*Acreage of Farmland (Summary).* The changes assumed in the Conservation Needs Inventory were used to determine the acreage that would be available for commercial agriculture by 1975.<sup>14</sup> It was assumed that these estimates were the most accurate of any that were available. It was further assumed that the acreage devoted to non-commercial agriculture—part-time, residential, and abnormal farms—would parallel the changes in acreage in commercial farms.

*Calculating the Acreage of Farmland.* In the Conservation Needs Survey,<sup>15</sup> the inventory acreage was based on the total land area of the county as found in the Census, less Federal land, urban, and built-up areas and water areas which were not excluded by the Census. This inventory acreage was then divided into cropland, pasture and range, forest and woodland, and other land by the county committees conducting the surveys. The committees then anticipated changes in

<sup>12</sup>*Census of Agriculture: 1954, loc. cit.*

<sup>13</sup>Louis J. Ducoff, "Classification of the Agricultural Population in the United States," *Journal of Farm Economics*, Vol. XXXVII, No. 3, p. 515, citing unpublished records of the 1950 Censuses of Population and Agriculture compiled in a matching study made cooperatively by the Bureau of the Census and the Department of Agriculture.

<sup>14</sup>National Inventory of Soil and Water Conservation Needs, United States Department of Agriculture (preliminary data).

<sup>15</sup>*Ibid.*

land use which were foreseeable and determined the acreage within their counties expected to be used as cropland, pasture and range, forest and woodland, and for other purposes in 1975.

This inventory acreage differs greatly from the land in farms listed by the Census of Agriculture.<sup>16</sup> Many counties contained considerable agricultural land which was not in farms. Therefore, it was decided to deduct the forest and woodland from the inventory acreage at both the beginning and end of the projection period. The remainder was then regarded as approximating the acreage of farmland to be used in this study. By doing this, it was found that an increase in acreage of "farmland" in Missouri of 0.47 percent was expected by 1975. The different economic areas showed considerable variation in expected change. Economic Area 2a was expected to have the greatest increase—2.49 percent—and Economic Area 7 the greatest decrease—1.61 percent (Table 2).

The acreage that will determine farming opportunities is cropland and pasture. The combined area in these uses in commercial farms was tabulated for Missouri from the Census<sup>17</sup> by economic areas. These acreages are referred to as farmland in the analysis that follows. To project these acreages to 1975, the percent changes shown in Table 2 were applied. Assuming a linear change, the acreage increase or decrease was divided equally into four increments to determine the acreage at the beginning of each five-year period. Tables 22 and 23 in the appendix show these calculations in more detail and indicate the acreage expected at the beginning of each quinquennial period between 1955 and 1975 by economic areas. According to these calculations, the farmland in the State is expected to increase 115,908 acres by 1975.

TABLE 2—PERCENT CHANGE IN ACREAGE OF "FARMLAND" EXPECTED IN MISSOURI BY ECONOMIC AREAS BETWEEN 1954 and 1975\*

Economic Area	Percent Change
1 and A	0.46
2a	2.49
2b	0.70
3	-1.30
4	-1.01
5	-1.42
6 and B	-0.22
7	-1.61
8	1.04
9a	4.21
9b	4.40
Missouri	0.47

\*Based upon preliminary figures of the Missouri Portion of the National Inventory of Soil and Water Conservation Needs.

<sup>16</sup>In 1954, the Census listed 34,195,379 acres in farms in Missouri. The inventory acreage of the Conservation Needs Survey was 40,921,894.

<sup>17</sup>*Census of Agriculture: 1954, op. cit.*, pp. 184 ff.

## Changes in Size of Commercial Farms

In the preceding section, assumptions were developed for use in calculating the acreage of farmland available for commercial agriculture. The number of commercial operating units will depend upon the size of these farms. Data in Table 3 show that the average size of farms in Missouri increased from 132.2 acres in 1920 to 169.6 acres in 1955.<sup>18</sup> Further changes will depend mainly upon: (1) the influence of technology upon efficiency in farming, and (2) profitable markets for agricultural products.

*Expected Changes in Technology.* It has been pointed out that one farm worker supported 3.95 persons in 1840. Estimates of the U. S. Department of Agriculture showed that he supported 23.55 persons in 1958.<sup>19</sup> This spiraling rate of efficiency increase in farming will surely reduce the number of farms by 1975.

TABLE 3-AVERAGE SIZE OF FARMS IN MISSOURI BY SPECIFIED YEARS FROM 1920 TO 1954\*

Year	Average Size (Acres)
1920	132.2
1925	125.3
1930	131.8
1935	125.9
1940	135.6
1945	145.2
1950	152.7
1955	169.6

\*As reported in the Census of Agriculture: 1954, p. 3

There are factors, however, which limit the adoption of technology. The most important from the economic point of view is cost in relation to returns. Very few farmers are using labor-saving machinery, fertilizer, improved seed, and other types of improved technology at the level where marginal costs are equal to marginal returns. Barton<sup>20</sup> indicated that by 1975, greater use of presently known production practices would make it possible to meet expected requirements for farm products. He cited such practices as greater use of fertilizer, pesticides, improved seed, and formula feeds as examples of factors expected to increase farm output. There are undoubtedly many reasons for failure to adopt all of the improved practices available to farmers. They include the low educational levels and conservative attitudes of some farmers, lack of funds to purchase such items as fertilizer and machinery, and the imbalance that would be

<sup>18</sup>Census of Agriculture: 1954, *op. cit.*, p. 3.

<sup>19</sup>See p. 2

<sup>20</sup>Glen T. Barton, "Technological Change, Food Needs, and Aggregate Resource Adjustment", *Journal of Farm Economics*, Vol. XL, No. 5, 1958. pp. 1435-7.

introduced by placing high capacity equipment on a small acreage of land. It has been, to a considerable extent, newer, larger, and faster machinery that has permitted one man to farm more acres, thus working toward a decrease in number of farms.

On the other hand, with certain intensive enterprises, it would be possible to increase the number of commercial farms in Missouri materially. Investigators employed by the Agricultural Research Service have shown that there is considerable variation in the rate of increase in size of different types of farms. Generally, crop farms have made the most rapid increase. In the case of poultry farms in New Jersey, farm size has remained at 10 acres since 1947. Commercial farms in the Corn Belt were reported to vary from an average of 166 acres in the case of hog-dairy farms, to 240 acres for hog-beef farms in 1958.<sup>21</sup> Clearly, type of farming affects the size of operating units; therefore, the total number in an area.

It is likely that many farmers will not have adopted all of the labor-saving devices known in the 1950s by 1975. However, improvements in equipment will continue and some will be using much more efficient machinery than we have now. As a consequence, the trend toward larger farms will continue.

*Expected Changes in the Extent of the Market.* A U. S. Department of Agriculture report in 1956 projected the requirements for various agricultural products to 1975.<sup>22</sup> The data showed that a 45 percent increase in production of livestock and livestock products, over the average 1951-1953 level would be required to meet the needs in 1975. A 25 percent increase in crop output would be needed by that date. Both of these figures were averages with a wide range of from a 105 percent increase in grain sorghum, to a decrease of 9.0 percent in wheat. On the basis of these figures Barton concluded that application of present technology would meet the expected requirements.<sup>23</sup>

If Barton's estimates prove reasonably accurate, there is little basis for assuming great increases in the number of farms due to more intensive land use. A shift to small acreages and intensive enterprises would be logical only if Missouri farmers were to find themselves with considerable comparative advantage over those in other states for such products as poultry, eggs, feeder pigs, small fruits, and vegetables. It seems more likely that farms will continue to get larger, so the operators can command more resources and lower their unit costs without changing their enterprises materially. Farmers who need larger acreages can be expected to compete effectively with small operators in bidding for land which comes on the market. The increase in number and percentage of Class I, II, and III farms shown in Table 1 is, therefore, expected to continue.

<sup>21</sup>*Farm Costs and Returns*, Agricultural Research Service, U. S. Department of Agriculture, Agricultural Information Bulletin No. 176 (Washington: Government Printing Office, 1959) pp. 8-70.

<sup>22</sup>Glen T. Barton, and Robert O. Rogers, *Farm Output, Past Changes and Projected Needs*, U. S. Department of Agriculture, Agricultural Information Bulletin 162 (Washington: Government Printing Office, 1956).

<sup>23</sup>See p. 21.

The future size of farms will be determined by factors which are extremely complex. Technology builds upon technology which tends to result in a geometric progression, but linear changes were assumed in the prediction of future number of farms. There is, of course, a realistic limit beyond which the size of farms may not increase, but this limit is not likely to be reached by 1975.

### Calculating the Number of Commercial Farms

Using the assumption of a constant percentage increase in the size of farms from 1950 to 1975, based upon the 1950-1955 trend, it was possible to arrive at an expected number of commercial farms. The number of commercial farmers as well as the acreage of farmland for 1950 and 1955 was available from the Census of Agriculture.

By dividing acres of farmland by number of farms, the average size was obtained for each economic area in each of the census years. Farm size increased in all parts of the state with a range of from 9.7 percent in Area 7 to 20.5 percent in Area 4. By applying the appropriate percentage increase to the 1955 average size for each economic area, the expected 1960 average size was determined. The same percentages were applied again to get the 1965 estimated size, and so on to 1975. More detail for this procedure is found in Tables 25, 26 and 27, in the Appendix, including the average size and the number of commercial farms in each economic area for each quinquennial period.

Having estimated the acreage available for commercial agriculture and the average size of commercial farms, the number of commercial farmers to be expected at the beginning of each five-year period in each economic area could be determined. Table 4 shows that the number of commercial farms in Missouri will decrease from 164,600 in 1950 to 86,436 in 1975. Every economic area is expected to have a substantial reduction.

TABLE 4-NUMBER OF COMMERCIAL FARMS IN 1950 AND 1955 AND ESTIMATED NUMBER TO 1975 AT FIVE-YEAR INTERVALS BY ECONOMIC AREAS IN MISSOURI\*

Economic Area	Number of Farms					
	1950	1955	1960	1965	1970	1975
1 and A	21102	17818	15418	13382	11617	10079
2a	24051	21019	19142	17418	15869	14432
2b	21177	19387	17560	15923	14455	13099
3	19384	16779	14807	13099	11605	10273
4	9259	7602	6297	5222	4333	3585
5	9666	8270	7249	6346	5581	4910
6 and B	16379	14056	12653	11382	10279	9269
7	19301	16092	14641	13295	12086	11003
8	5818	4386	3650	3042	2534	2112
9a	6744	5583	4751	4083	3433	2919
9b	11719	9315	7899	6681	5640	4755
Missouri	164600	140307	124067	109828	97432	86436

\*Figures for 1950 and 1955 are from the Census. Others were estimated in this study.

### Changes in Proportion of Low-Income to Adequate-Income Farms

There is evidence that low-income farmers are being squeezed out of agriculture. In fact, the reduction in numbers is largely responsible for the increase in average size of farms. It was observed earlier that the number of adequate-income farms had increased by 58.9 percent, while low-income farms—Class IV, V, and VI—had decreased by 24.0 percent since 1920. For this study, the percentage increase in adequate-income farms occurring between 1950 and 1955 was determined. This rate was then applied to all commercial farms by five-year periods up to 1975. Since the factors involved are similar to those which influenced the changes in size of farms, this assumption rests upon a similar defense.

### Calculating the Expected Number of Adequate-Income Farms

By calculating the percentage that the total number of Economic Class I, II, and III farms was of all commercial farms as reported by the Census in 1950 and 1955, it was possible to determine the increase in percentage between the two census years. For example, in Missouri in 1950, 23.4 percent of all commercial farms were in Economic Classes I, II, and III, i.e., adequate-income farms as defined in this study. By 1953, 31.1 percent of all commercial farms were of these classes,<sup>24</sup> which was an increase of 7.7 percent for the State. This 7.7 percent increase was then added to give 38.8 percent of all commercial farms expected to yield adequate incomes by 1960. Subsequent increases of 7.7 percent for each quinquennium, brought the estimated percentage to 61.9 in 1975. More details of these calculations and the percentage of commercial farms expected to return adequate incomes for each quinquennium by economic areas to 1975, are shown in Table 28 in the Appendix.

Table 5 shows that, for Missouri, the number of adequate-income farms will increase from 38,561 in 1950 to 51,472 in 1975, according to these calculations.

*Analysis of Number of Adequate-Income Farms.* Economic Areas I and A were the only sections of the State to show steady declines in the number of adequate-income farms. Since these are the better farming areas of the State, it raises some questions as to the adequacy of the projection method. Table 25, in the Appendix, shows that these areas had a 15.5 percent increase in size of farms between 1950 and 1955. This was considerably higher than other areas with farms of comparable size in 1955. As a result, the projected size was the largest in the State and, consequently, the estimated number of commercial farms decreased more rapidly than in other areas. These areas also had a relatively small increase in percent of adequate-income farms between 1950 and 1955, as may be seen from Table 28 in the Appendix. While it might be expected that a greater increase in the size of farms would result in a corresponding advance in the percentage of adequate-income farms, this area proved to be an exception for the

<sup>24</sup>These percentages have been calculated from figures on page 184 of the *Census of Agriculture: 1954*.

two census years used. It is probable that the findings for Areas I and A were not entirely satisfactory for these reasons.

Area 9b, which is the cotton-producing section of the delta in Southeast Missouri, also presented some problems. From Table 28, in the Appendix, it may be observed that this area had the greatest increase in percentage of adequate-income farms between 1950 and 1955—17.0 percent. Adding this percentage to each succeeding quinquennium, resulted in that area showing 100 percent of the farms as adequate income units by 1970. As 100 percent is approached, further increase will come about slowly. To be consistent, however, the figures were used as they were determined, even though it appears that the estimates will not be realized entirely.

The smallest percentage increase in acreage of farmland per farm between 1950 and 1955 was in Area 7; therefore, the number of farms did not decline as rapidly as in other areas. This situation resulted in a relatively large increase in the number of adequate-income farms for this area. One of the problems in the poorer soil areas, is that individuals are unable to acquire the resources needed to expand their operations. This being true, the size of farms does not increase as rapidly as in areas where farmers are more prosperous.

This analysis has been based upon a minimum desirable family income. Had this minimum been set higher, virtually no opportunities for entry into farming would have been indicated in some of the poorer areas. Good opportunities are more likely to be found in the better farming areas, but the quality of opportunity above the minimum was not considered in the study.

TABLE 5—NUMBER OF ADEQUATE-INCOME FARMS IN 1950 AND 1955 AND ESTIMATED NUMBER TO 1975 AT FIVE-YEAR INTERVALS, BY ECONOMIC AREAS IN MISSOURI\*

Economic Area	Number of Adequate-Income Farms					
	1950	1955	1960	1965	1970	1975
1 and A	7991	7584	7293	6957	6587	6148
2a	5741	6695	7300	8343	8871	9222
2b	6026	7590	8727	9602	10249	10676
3	4568	5281	5834	6196	6406	6482
4	1345	1636	1795	1854	1842	1775
5	1297	1480	1624	1707	1752	1763
6 and B	3494	3606	3809	3927	3999	4013
7	1781	2142	2548	2858	3094	3378
8	408	547	657	715	735	729
9a	1498	1961	2280	2459	2534	2531
9b	4412	5085	5656	5919	5640	4755
Missouri	38561	43607	47523	50537	51709	51472

\*For 1950 and 1955 the number of farms represents the sum of Class I, II and III farms, as reported in the Census. Numbers for later years were estimated in this study.

## Multiple-Operators

Where two or more farm operators work on the same farm, each receiving an adequate income, there exists an additional adequate-farming situation. Under these conditions, the minimum gross income would have to be approximately doubled, i.e., \$10,000, which would make the operating unit at least a Class II farm under the census classification. The extent of multiple operatorships on Class I and II farms in Missouri is not known. For this reason, the calculations did not include estimates of adequate farming opportunities on these types of farms.

### ESTIMATING OPPORTUNITIES TO BECOME AVAILABLE

Vacancies on adequate-income farms could occur through the death, migration, or retirement of the operators. Also, an increase in the number of adequate-income farms would constitute additional opportunities, while a decrease would constitute a reduction in opportunities.

## Expected Deaths of Farm Operators

To arrive at death rates among farmers, it was necessary to refer to the 1950 population records, since this was the last complete census. The number of deaths within various age groups was available for the male-white population from the Bureau of Vital Statistics.<sup>25</sup> It was assumed that most of the adequate-income farm operators were of the white race; therefore, male-white deaths were applied to the male-white population of Missouri<sup>26</sup> by corresponding age groups to get age-specific death rates. Thereafter, these rates were calculated as deaths per 1000 males. An assumption inherent in the use of these figures, was that the death rate of farm operators would be similar to that for all white males of like age. It was further assumed that the 1950 death rate would remain constant to 1975. While this assumption might be questioned, it could be in considerable error without affecting the results of this study significantly. Table 30, in the Appendix, shows the method used in determining the death rate.

It was necessary to assume an age distribution for the adequate-income farmers. A publication of the Bureau of the Census<sup>27</sup> shows the percentage distribution of adequate-income farmers in the United States, by age, as determined from the 1950 Census. This distribution, shown in Table 31, was assumed to be applicable to each of the economic areas in Missouri and to remain constant throughout the projection period.

By applying the percentages in each age group to the number of farm operators in each economic area in Table 5, it was possible to assume an age

<sup>25</sup>Bureau of Vital Statistics, Division of Health. *Vital Statistics, State of Missouri: 1950*, (Department of Public Health and Welfare, Jefferson City) Table L.

<sup>26</sup>U. S. Bureau of the Census, *U. S. Census of Population: 1950*. Vol. II, Characteristics of the Population, Part 25, Missouri (Washington: Government Printing Office, 1952) p. 50.

<sup>27</sup>U. S. Bureau of the Census, *Farms and Farm People: Population, Income and Housing Characteristics by Economic Size of Farm* (Washington: Government Printing Office, 1953) p. 54.

distribution of operators on adequate-income farms. Since a new population was present within each age group during the succeeding five-year periods, it was necessary to apply the death rate to the population found at the beginning of each period. Table 6 shows that the number of deaths of adequate-income farm operators expected in Missouri for each five-year period will increase from 1,579 during the 1955-60 period, to 1,869 during the 1970-75 period.

### Expected Migration of Farm Operators

If operators of adequate-income farms should dispose of their business assets, each such instance would constitute an additional opportunity to enter farming on an adequate basis. Migration of farmers has been occurring and is expected to continue.

**TABLE 6-ESTIMATED DEATHS OF OPERATORS OF ADEQUATE-INCOME FARMS BY ECONOMIC AREAS AND BY FIVE-YEAR PERIODS FROM 1955 TO 1975**

Area	Number of Deaths			
	1955-60	1960-65	1965-70	1970-75
1 and A	275	264	252	237
2a	242	264	302	321
2b	275	316	347	364
3	191	210	223	231
4	59	64	65	65
5	53	58	62	63
6 and B	131	138	142	144
7	78	94	103	113
8	20	23	26	27
9a	71	82	89	92
9b	184	204	215	203
<b>Missouri</b>	<b>1579</b>	<b>1717</b>	<b>1826</b>	<b>1860</b>

Bowles<sup>28</sup> studied the migration of rural-farm males intensively. From her work it is possible to apply different age-specific migration rates to the rural-farm population in each economic area of Missouri, based on migration during the 1940-50 decade. To have used these rates in this study, however, would have required the assumption that migration from adequate-income farms was equal to that from low-income farms. If migration is an attempt to adjust to conditions causing low incomes, then, the adequate-income farmers would be expected to have a much lower migration rate. A similar problem occurs in the demand for farming opportunities on the part of persons who move into farming from the urban population. In many cases, these persons have acquired sufficient resources to command an adequate-income farming opportunity. In this study, it was assumed that the demand for adequate-income opportunities from persons

<sup>28</sup>Gladys K. Bowles, *Net Migration From the Rural-Farm Population, 1940-50*, Agricultural Marketing Service, U. S. Department of Agriculture, Statistical Bulletin No. 176 (Washington: Government Printing Office, 1956) pp. 120-132.

migrating into agriculture would be equal to the out-migration of adequate-income farmers. Therefore, the net migration of operators of adequate-income farms was assumed to be zero.

### Retirement of Farm Operators

In the past, farmers have retired at different ages. Moore and Wayt<sup>29</sup> indicated that some tend to retire to part-time and lower-income farms as they advance in age. Much speculation has been offered recently as to the influence of Social Security upon the retirement age of farmers.

Ellickson<sup>30</sup> reported that, in 1958, one-half million families were receiving benefits for which they had qualified wholly or partly by paying Social Security taxes from their farm earnings. Kanel states:

The long-run effects of the social security program will depend on what farm retirement patterns emerge, and on possible changes in attitudes of farm people toward ownership of farms. Attitudes toward ownership might change because the acquisition of a paid-up equity in a farm will no longer be quite as important a source of retirement income.<sup>31</sup>

Apparently, no studies have been made of retirement tendencies of adequate-income farmers. Many of these men are financially able to retire, and Social Security gives them an added incentive to do so. Furthermore, these farmers are able to assist a younger man who is seeking to start farming, or to move up to a better farm. In this study, retirement of adequate-income farmers has been assumed at age 65, and each retirement so calculated is regarded as an added opportunity for an interested person to start operating an adequate-income farm business.

Under the assumptions used, 7.0 percent of the operators of adequate-income farms was considered to be the proportion of retirements, since this was the percentage of operators over 65 years of age in each five-year period. Table 7 shows that the total number of opportunities to become available through retirements is expected to increase from 3,328 in the first five-year period, to 3,602 between 1970 and 1975.

### Changes in the Number of Adequate-Income Farms

Table 5 shows the number of adequate-income farms expected in each economic area of Missouri at the beginning of each five-year period to 1975. The assumptions used in calculating those numbers make them a function of (1) an increase in the acre-size of farms which tended to reduce the number of farms, (2) the change in acreage of farmland available, which was an increase in some areas and a decrease in others, and (3) an increase in the proportion of adequate-

<sup>29</sup>Moore and Wayt, *Loc. cit.*

<sup>30</sup>John C. Ellickson, "Social Security for Farm Operators: Acceptance in Farm Population Adjustment", *Journal of Farm Economics*, Vol. XL, No. 5, 1958. p. 1668.

<sup>31</sup>Don Kanel, "Opportunities for Beginning Farmers, Why are They Limited?" North Central Regional Publication, University of Nebraska, Lincoln. Preliminary Report, May 1959 p. 39 (Mimeographed)

income farms, compared to low-income commercial farms. The net influence of these factors varied from one area to another and from one quinquennial period to the next.

**TABLE 7-ESTIMATED RETIREMENTS OF OPERATORS OF ADEQUATE-INCOME FARMS BY ECONOMIC AREA AND FIVE-YEAR PERIODS FROM 1955-1975**

Economic Area	Number of Retirements			
	1955-60	1960-65	1965-70	1970-75
1 and A	511	487	461	430
2a	511	584	621	646
2b	611	672	717	747
3	408	434	448	454
4	126	130	129	124
5	114	119	123	123
6 and B	267	275	280	281
7	178	200	217	236
8	46	51	52	51
9a	160	172	177	177
9b	396	414	395	333
Missouri	3328	3538	3620	3602

If the number of farms were to increase in a given economic area from one period to the next, an increase in the number of opportunities would result. Conversely, a decrease in number of farms from one time period to the next would reduce the number of opportunities. Table 8 shows that the combination of factors outlined here caused a continual decrease in number of farms in Economic Area 1 and A, whereas most of the areas increased. Areas 4, 8, 9a, and 9b increased at first, then decreased.

**TABLE 8-EXPECTED CHANGES IN NUMBERS OF ADEQUATE-INCOME FARMS BY ECONOMIC AREAS AND FIVE-YEAR PERIODS FROM 1955-1975**

Economic Area	Changes in No. from Beg. to End of Period			
	1955-60	1960-65	1965-70	1970-75
1 and A	-291	-336	-370	-439
2a	605	1043	528	351
2b	1137	875	647	427
3	553	362	210	76
4	159	59	-12	-67
5	144	83	45	11
6 and B	203	118	72	14
7	406	310	236	284
8	110	58	20	-6
9a	319	179	75	-3
9b	571	263	-279	-885
Missouri	3916	3014	1172	-237

### Total Number of Operator Opportunities

Previous tables have shown the expected deaths, retirements, and changes in number of farms. Since a zero net migration had been assumed for the ope-

rators of these farms, the sum of the three estimates was regarded as the total number of opportunities that would become available. Table 9 shows a steady decline in these opportunities as time passes with considerable variation from one area to another.

TABLE 9-ESTIMATED OPPORTUNITIES ON ADEQUATE-INCOME FARMS IN MISSOURI BY ECONOMIC AREAS AND BY QUINQUENNIAL PERIODS FROM 1955-1975

Economic Area	Number of Opportunities			
	1955-60	1960-65	1965-70	1970-75
1 and A	495	415	343	228
2a	1358	1891	1451	1318
2b	2023	1863	1711	1538
3	1152	1006	881	761
4	344	253	182	122
5	311	260	230	197
6 and B	601	531	494	439
7	662	604	556	633
8	176	132	98	72
9a	550	433	341	266
9b	1151	881	331	-349
Missouri	8823	8269	6618	5225

### Farm Labor Opportunities

In the past, a number of farm-reared youth have found opportunities to work as farm laborers. There is increasing evidence that opportunities of this sort will become fewer and fewer. In 1950, a total of 20,605 farm laborers worked on farms more than 150 days in Missouri.<sup>32</sup> By 1955, this figure had decreased to 11,999, a reduction of 41.8 percent.<sup>33</sup> A U. S. Department of Agriculture publication reported 655,000 workers employed 150 or more days in 1957. This was a decrease of more than 100,000 from the previous year.

According to this bulletin, the number of persons working less than 25 days per year on farms, has been increasing recently which indicates that more part-time work of this sort may be available.<sup>34</sup>

No doubt there will be some opportunities for full-time work as farm laborers which will likely be superior to many low-income farm operatorships. However, the number of these opportunities seems to be declining rapidly, and no calculations were made to determine the number that reasonably could be expected.

<sup>32</sup>United States Bureau of the Census, *U. S. Census of Agriculture: 1950*. Vol. 1, Counties and State Economic Areas, Part 10. (Washington: Government Printing Office) p. 26.

<sup>33</sup>*Census of Agriculture: 1954, op. cit.*, p. 12.

<sup>34</sup>Sheridan T. Maitland and Dorothy Anne Fisher, *The Hired Farm Working Force of 1957*, Agricultural Marketing Service, United States Department of Agriculture, Agricultural Information Bulletin No. 208 (Washington: Government Printing Office, 1959) pp. 1 and 2.

## SUMMARY

The future supply of farming opportunities will be influenced by many factors which are very difficult to anticipate. In this analysis, the estimated number of adequate-income farms for the future was based upon trends from 1950 to 1955, as reported by the Census, and upon estimates of the acreage of land that would be in farms made by county committees who worked on the Missouri portion of the National Soil and Water Conservation Needs Survey. The number of entry opportunities that would become available was considered to be equal to the sum of deaths and retirements plus or minus changes in the number of adequate-income farms.

For Missouri, the trend in number of entry opportunities is expected to be downward, declining from 8,823 in the 1955-60 quinquennium, to only 5,225 by 1970-75. There was much variation in the changes expected by areas.

Farm labor opportunities have been declining rapidly, and relatively few will be available to young men in the future.

In several instances, the findings were not consistent. The number of opportunities to be available in Areas 1 and A declined more rapidly than seemed reasonable when compared with the rest of the state. Area 9b showed an unusually rapid decline for the last two projection periods as a result of 100 percent of the farms becoming adequate-income units. It is possible that opportunities in poorer areas will decline more rapidly than shown here, if farmers in these areas can acquire the resources needed to expand their operations.

## CHAPTER III

## DEMAND FOR FARMING OPPORTUNITIES

The percentage of the population of the United States engaged in farming decreased from 16.6 in 1950, to 12.0 in 1958. From 1950 to 1954, the decline amounted to 3.1 percent (16.6 to 13.1). From 1954 to 1958 it was only 1.5 percent (13.5 percent in 1954 to 12.0 percent in 1958). These data suggest that the trend may be slowing down. Numbers of farm people declined drastically from 25.1 million in 1950 to 21.9 million in 1954. After 1954, however, farm population decreased much less, leaving an estimated 20.8 million people on farms in 1958.<sup>35</sup>

It was assumed for this study, that the principal demand for farming opportunities would come from rural people. However, some do return to farms who have previously migrated from this population, and a few urban dwellers move to the farm for the first time as adults.

<sup>35</sup>*Farm Population Estimates for 1958*. U. S. Department of Agriculture, Agricultural Marketing Service, (Washington: Government Printing Office, 1958.) p. 2.

## SOURCES OF DEMAND

The demand for adequate farming opportunities is likely to come from three sources: (1) migrants from the non-farm population who choose to enter farming, (2) low-income farmers who desire to move up to adequate units, and (3) youth, mainly from the rural-farm population, who enter the labor force. Little is known about the relative effectiveness of the demand by these three groups.

As already indicated in this investigation, it is assumed that, at the adequate-income level, out-migration from farming is equal to in-migration.

## Demand From Low-Income Farmers

Several educational and service agencies are actively engaged in helping farmers increase their incomes. A large share of these efforts are directed at helping the low-income group. To be sure, many of them have increased their incomes through superior management, hard work, and unusual thrift. The extent of progress along this line is not known. Furthermore, a new obstacle in the form of rapidly increasing capital requirements is making this procedure of growing into an adequate business rather difficult.

Spillman, in 1919, described the steps in getting started in farming as the agricultural ladder. The steps in it were: (1) unpaid family worker, (2) hired man, (3) tenant operator, (4) encumbered owner, and (5) full owner.<sup>36</sup> By the middle of the twentieth Century, this procedure was no longer appropriate in agriculture. Long cited the difficulty of maintaining labor balance on the individual farm, indicating that by the time a farmer had climbed the ladder, his labor potential was greatly reduced.<sup>37</sup> Harris proposed a new ladder as follows: (1) project agreement on the home farm, (2) apprenticeship, (3) partnership, (4) transfer arrangement, and (5) full ownership.<sup>38</sup> He recognized that there were other ladders in use, but felt that the old ladder was out-of-date as an explanation of progress in becoming established on a farm. Hansing studied the progress of 49 farmers who bought farms in two counties in Virginia between 1930 and 1951. He found that very few climbed the old agricultural ladder.<sup>39</sup>

Numerous studies have pointed out the importance of family help in becoming established in a good farm business. Pond and Beneke studied 473 veterans who started farming in southern Minnesota after World War II. Of this group, 77.6 percent reported some assistance from relatives; 47 percent said this assistance was a big help toward success in their venture.<sup>40</sup> Arnold studied

<sup>36</sup>W. J. Spillman, "The Agricultural Ladder", *American Economic Review*, Vol. IX, No. 1, March, 1919, p. 170.

<sup>37</sup>Ervin J. Long, "The Agricultural Ladder: Its Adequacy As a Model for Land Tenure Research," *Land Economics*, Vol. 26, No. 3, September, 1950. pp. 269-275.

<sup>38</sup>Marshall Harris, "A New Agricultural Ladder," *Land Economics*, Vol. 26, No. 3, August, 1950. p. 258.

<sup>39</sup>Frank D. Hansing, "Buying A farm With or Without Family Help", *The Agricultural Situation*, Vol. 37, No. 6, June 1953. pp. 7 and 8.

<sup>40</sup>Raymond R. Beneke and George A. Pond, *Starting Farming in Southeastern Minnesota*, Minnesota Agricultural Experiment Station Bulletin 405, St. Paul, June 1950. p. 10.

182 families in Indiana who started farming between 1947 and 1953. Of his group, 71 percent started farming with substantial family assistance.<sup>41</sup> In a study of men who started as operators in Kentucky between 1927 and 1937, it was found that relatives were the chief source of long-term credit and an important source of short-term credit.<sup>42</sup>

In Missouri, Blase studied 25 farmers in each of seven type-of-farming areas, and found that 82 percent had received family assistance.<sup>43</sup> Jones, in a study of 152 farmers who entered the business in northern Missouri and southern Iowa in 1953, found that the parent's farm was the principal source of land for 48 percent of the men. Eighty-one of the 137 renters were related to the owner of the most valuable tract of land rented.<sup>44</sup>

While these studies do not reveal the relative effectiveness of demand for low producing units, they do point out the importance of family help in setting up a successful business. Presumably, such family help usually is made available to young men who are near the beginning of their working age.

A study by Fliegel suggests that many low-income farmers will not compete effectively for better farming opportunities because of their level of aspirations. He developed a test to measure a man's aspiration for success in life and gave it to 189 farmers in Fayette County, Pennsylvania, in 1957. In testing the significance of the relationship between level of aspiration and performance on the farm, the null hypothesis was rejected. The coefficients of correlation indicated a positive relationship between level of aspiration and (1) farm income, (2) level of living, (3) off-farm work, and (4) kind of off-farm work. He further found that the level of aspirations was negatively and significantly correlated with plans to continue farming.<sup>45</sup> To the extent that his tests were reliable, it can be concluded that many farmers suffer low incomes because they lack the aspiration to strive for greater returns. If this is true in Missouri, low-income farmers do not constitute a strong, effective demand for adequate-income farming opportunities. Because of insufficient evidence to predict the proportion of opportunities that these people would successfully pursue, it was assumed that they would present no effective demand for adequate farming opportunities, and that all of the opportunities calculated herein would be available to young men entering the labor force.

<sup>41</sup>Lester L. Arnold, *Problems of Capital Accumulation in Getting Started in Farming*. Indiana Agricultural Experiment Station Bulletin 638, Lafayette. February, 1957, pp. 10-13.

<sup>42</sup>"Young Farm Families Getting Established in Farming," *Annual Report of Kentucky Agricultural Experiment Station: 1951*. Lexington. pp. 42-43.

<sup>43</sup>Melvin G. Blase, "Procedures for Establishing Adequate Farm Businesses in Missouri", (unpublished Master's thesis, University of Missouri, Columbia, 1956.) p. 55.

<sup>44</sup>Ted L. Jones, "Progress in Becoming Established in Farming" (unpublished Master's thesis, University of Missouri, Columbia, 1958.) pp. 58 and 117.

<sup>45</sup>Frederick C. Fliegel, "Aspirations of Low-Income Farmers and Their Performance and Potential for Change", *Rural Sociology*, Vol. 24: September, 1959. pp. 205-214.

<sup>46</sup>Henry S. Shyrock, Jr., and H. T. Eldridge, "Internal Migration in Peace and War," *American Sociological Review*, Vol. XII, February, 1947. pp. 27-39.

## Demand From Youth Entering the Working Force

The preceding discussion has indicated that a young man who has substantial family help is in a strong position to demand an adequate-income farming opportunity. All members of the rural-farm population are subjected to a farm environment that may develop attitudes which are favorable or unfavorable to farming as an occupation. Rural activities and organizations usually encourage favorable attitudes. On the other hand, a low level-of-living on the farm may cause a farm-reared boy to seek his fortune elsewhere.

In estimating the demand for farms, it was assumed that the rural-farm-male population at age 20 would constitute the potential demand for farming opportunities. Age-specific death rates for 1950 and migration rates, based on the 1941-50 data, were used to reduce the number of boys who would be interested in starting to farm after they had finished their high school careers.

The death rate has been relatively stable and will not likely change greatly by 1975. In the case of the migration rate, there is reason to suspect greater error. Shyrock and Eldridge indicate that abundant employment opportunities stimulate migration, while depressed business conditions reduce migration.<sup>45</sup> The 1941-50 decade was an unstable period during which large numbers of farm people left for military service and defense work. By the end of the decade, many had returned to the farm. It is not known to what extent the Institutional-On-Farm-Training Program of the Servicemen's Re-adjustment Act caused a greater-than-normal number to be counted in the farm population in 1950. If Shyrock and Eldridge are correct, by 1975 migration rates will be subjected to influences which are as yet unknown.

### CALCULATING DEMAND FOR FARMING OPPORTUNITIES

The procedure used in calculating the demand for farming opportunities was similar to that followed by Joslyn in Iowa.<sup>47</sup> For Missouri, the Census reports the population in 1950 by ages as follows:<sup>48</sup>

<i>Age</i>	<i>Rural-Farm Males</i>
Under 5	43,696
5-9	45,389
10-14	44,154
15-19	39,739

These data were used as a base from which deaths and migrants were subtracted to indicate the number remaining alive and on farms for each five-year period. Since the group under five years of age would reach age 20 between 1965 and 1970, it was necessary to estimate a still younger population, one that would

<sup>47</sup>Kenneth H. Joslyn, "Factors Affecting Future Farming Opportunities" (unpublished Master's thesis, Iowa State College, Ames, 1958).

<sup>48</sup>U. S. Bureau of the Census, *U. S. Census of Population: 1950*. Vol. II, Characteristics of the Population, Part 25, Missouri, p. 48.

be under five years of age in 1955. Those remaining from this group will be expected to constitute the demand during the 1970-75 period under the assumptions of this study.

### Reducing the Population by Expected Deaths

Vital statistics for Missouri show that the number of male-white deaths in the various age groups in 1950 were as follows:<sup>49</sup>

<i>Ages</i>	<i>Deaths</i>
Under 5	1,412
5-9	90
10-14	84
15-19	158

Since these statistics were not divided between farm and non-farm people, it was necessary to assume that deaths were distributed between these groups in proportion to their numbers. From the Census, the numbers of male-white persons under 20 years old by age groups were found to be:<sup>50</sup>

<i>Ages</i>	<i>Male Whites</i>
Under 5	180,888
5-9	151,321
10-14	130,884
15-19	123,551

Death rates per 1000 males were calculated from these two sets of data.

<i>Ages</i>	<i>Deaths per 1000 In Five Years</i>
Under 5	39.00
5-9	2.95
10-14	3.20
15-19	6.35

Since the evidence was insufficient to adjust these findings between the various areas of the state, they were assumed to be applicable in all sections throughout the projection period. Application of them gave the following results for the number of survivors at age 20:

<i>Ages</i>	<i>Survivors</i>
Under 5	41,991
5-9	45,255
10-14	44,012
15-19	39,486

### Reducing the Population by Expected Migration

Bowles determined net-migration rates for the rural-farm population which occurred between 1940 and 1950. Her work was reported by sub-regions, seven

<sup>49</sup>Bureau of Vital Statistics, *Vital Statistics, State of Missouri: 1950*, Division of Health, Department of Public Health and Welfare, Jefferson City. Table L.

<sup>50</sup>Census of Population: 1950, *loc cit.*

of which contained all of Missouri's economic areas. Since her work was based, in part, on the number of persons alive at the end of the period, these rates were regarded as applicable to a population which had been adjusted for deaths. Table 10 shows the net migration rates which were applied to the various economic areas of Missouri as taken from Bowles study.<sup>51</sup>

**TABLE 10-NET MIGRATION FROM THE RURAL-FARM-MALE POPULATION OF MISSOURI BY ECONOMIC AREAS, SUB-REGIONS AND SELECTED AGE GROUPS 1940-1950**

Economic Area	Sub-Region*	Percent Change Due To Migration by Age Groups			
		Under 5	5-9	10-14	15-19
1 and A	85	-13.9	-18.7	-40.6	-47.3
2a and 2b	71	-10.7	-18.9	-49.8	-53.4
3	84	-7.8	-18.5	-52.8	-57.1
4	82	-11.0	-22.2	-57.9	-60.2
5	73	-14.0	-27.7	-60.9	-62.3
6 and B	72	**	-13.8	-46.1	-55.6
7 and 8	73	-14.0	-27.7	-60.9	-62.3
9a and 9b	76	-14.6	-25.9	-54.5	-57.4

\* Some of the sub-regions included land outside of Missouri.

\*\*The net change due to migration was less than 500 persons for this sub-region. Net migration for this group was considered to be zero for this study.

Source: Gladys K. Bowles, *Net Migration from the Rural-Farm Population, 1940-50*, Agricultural Marketing Service, U. S. Department of Agriculture, Statistical Bulletin No. 176. (Washington: Government Printing Office, 1956.) pp. 120-132.

These migration rates were applied to the rural-farm-male population expected to remain alive until 1955. The number of migrants so determined, was then subtracted to yield the number in each age group expected to remain alive and on farms until 1955. For Missouri these totals are as follows:

<i>Ages</i>	<i>Rural-Farm Males Expected to Remain Alive and on Farms to 1955</i>
Under 5	39,636
5-9	40,229
10-14	32,256
15-19	28,199

These numbers were assumed to advance into the next age group during the ensuing five years. It was further assumed that additional migration would remove the surplus of 20-year-olds so there would not be a build-up in numbers to command opportunities which might become available at a later date.

This procedure was repeated for each five-year period to 1975. Table 11

<sup>51</sup>Gladys K. Bowles, *Net Migration from the Rural-Farm Population, 1940-50*, Agricultural Marketing Service, U. S. Department of Agriculture, Statistical Bulletin No. 176. (Washington: Government Printing Office, 1956.) pp. 120-132.

shows that a steady decline can be expected in the state in number of rural-farm males reaching age 20 throughout the projection period.

The underlined entries in Table 11 show the changes that can be expected in the group who were under five years of age in 1950. By the time they have reached working age in 1970, their numbers may be reduced by 58.0 percent through death and migration, according to these calculations. Table 32, in the Appendix, shows the expected numbers of rural-farm males within each age group by economic areas in Missouri for five-year periods until 1975.

TABLE 11-ESTIMATED NUMBERS OF RURAL-FARM MALES BY SELECTED AGE GROUPS AT FIVE-YEAR INTERVALS IN MISSOURI, 1950-75\*

Age Groups	Number On Farms					
	1950	1955	1960	1965	1970	1975
Under 5	<u>43,696</u>	39,408**	---	---	---	---
5-9	<u>45,389</u>	<u>39,636</u>	35,757	---	---	---
10-14	44,154	<u>40,229</u>	<u>35,166</u>	31,732	---	---
15-19	39,739	32,256	<u>29,462</u>	<u>25,797</u>	23,278	---
Entered Age						
20***	---	28,199	22,909	20,961	<u>18,374</u>	<u>16,578</u>

\*Number for 1950 were taken from the Census of Population; others were estimated.

\*\*Those under five years of age in 1955 were estimated on the basis of numbers of 15-44 year-old rural farm women. The numbers of these women in 1950 were reduced by death and migration rates, and the ratio of boys under five years of age to women from 15-44 years of age in 1950, was used to make the estimate.

\*\*\*Rural-farm males assumed to have entered the working force during the preceding five years. Actually, only those for whom opportunities were available remained in the farm population.

Note: Underlined entries in this table show the diminishing size of the group who were under five years of age in 1950.

#### SUMMARY

Farm youths reaching the working age, were assumed to comprise the principal source of effective demand for farming opportunities. From the age-specific, rural-farm-male population of the 1950 Census, deaths and migrations were deducted to estimate the number who would be demanding farming opportunities in each five-year period to 1975. Death rates are not expected to vary greatly from those used in making the estimates. Although the complexity of factors which causes migration create doubt as to the stability of the rural population, the key to the situation is opportunity to earn as much on a farm as in an alternative occupation. It was assumed that a sufficient number of people would remain on the land to occupy all of the adequate-income farms. As a result of these calculations, the numbers reaching age 20 are shown to decline from 28,199 in the 1950-55 period, to 16,578 between 1970 and 1975. This is a reduction of 11,621 which is the result of fewer boys being born and reared on farms during each succeeding quinquennium.

## Chapter IV

### RELATING THE IMBALANCE TO THE PROGRAM OF VOCATIONAL AGRICULTURE

The supply of farming opportunities already has been discussed. After setting up a \$5000 annual gross income as the criterion for a minimum-farming opportunity, the number of such operating units expected in each economic area of Missouri was determined. If farms were adjusted to adequate-income units, the number of opportunities for entry would decline steadily from 8,823 in the 1955-60 period to 5,225 in the 1970-75 period.

It was assumed that the principal demand for these opportunities would come from farm-reared boys as they became working age. Accordingly, migration and death rates were used to reduce the 1950 population by age groups and, in that manner, to calculate the number of those persons expected to be on farms at age 20 during each quinquennial period to 1975.

In the discussion that follows, comparisons are made between the supply of and the demand for farming opportunities. Since program planning in agricultural education has been a concern of this investigation, comparisons with enrollments in vocational agriculture are made a part of the analysis.

#### THE IMBALANCE

Two views of the imbalance between the supply of and demand for farming opportunities are presented. First, the number of 20-year-old men expected to be in the farm population is compared with the expected number of opportunities. This comparison indicates the degree to which the 1940-50 rate of net out-migration would be sufficient to create a balance between the supply of and the demand for farming opportunities. Second, the estimated number of 15 to 19-year-old farm boys is compared with the number of farming opportunities expected to be available to them. This later comparison is of more significance than the first to administrators of secondary schools since these boys are approximately of high school age.

#### Opportunities Compared With Young Men Entering Labor Force

The data already presented show that 8,823 adequate-farming opportunities were expected to become available during the 1955-60 quinquennium, and that 22,909 young men in the farm population reached age 20 during this same period. Thus, there was an imbalance of 14,086 who had to accept either some other employment or inadequate farming opportunities. In other words, only 38.5 percent of the boys remaining on farms until age 20 could have expected to find adequate farming opportunities in that five-year period. Table 12 shows that the number of opportunities will decrease somewhat faster than the number of youth; in the 1970-75 period, only 31.5 percent of the young men who will be

entering the labor force can be expected to find adequate-income opportunities on farms. For the 1955-75, 20-year period, enough farming opportunities for 36.7 percent of these young men should be available.

It is well to observe that the figures for Missouri are built-up totals from the state's nine economic areas. Considerable variation exists between areas.

**TABLE 12-COMPARISONS OF OPPORTUNITIES TO FARM WITH THE NUMBER OF YOUTH ENTERING WORKING AGE IN MISSOURI BY FIVE-YEAR PERIODS, 1955-1975**

Period	Opportunities	20-Year-Old Farm Males	Surplus of Men	Percent Able To Farm
1955-60	8,823	22,909	14,086	38.5
1960-65	8,269	20,961	12,692	39.5
1965-70	6,618	18,374	11,756	36.0
1970-75	5,225	16,578	11,353	31.5
Total (1955-75)	28,935	78,822	49,887	36.7

Table 13 shows that adequate-farming opportunities existed for only 12.4 percent of the farm-reared boys who reached age 20 in Area 8 during the 1955-60 period. At the other extreme, there were enough opportunities in Area 2b for 90.1 percent of the local boys. The data also show wide variations in the numbers of opportunities and of 20-year-old farm males between areas. In fact, variations in the numbers of opportunities among areas are greater (176 to 2023) than in the number of youths (1407 to 2911).

The relationships shown in Table 13 seem reasonable except for Economic Area 1 and A. Here only 20.3 percent of the men who entered the labor force in 1955-60 five-year period found adequate farming opportunities. The problem seemed to be caused by a rapid increase in size of farms between 1950 and 1955

**TABLE 13-COMPARISON OF THE NUMBER OF OPPORTUNITIES TO FARM WITH THE NUMBER OF RURAL-FARM MALES ENTERING WORKING AGE BY ECONOMIC AREAS OF MISSOURI, 1955-60**

Economic Area	Number of Opportunities	Number of Rural-Farm Males Entering Age 20	Percent to Find Opportunities
1 and A	495	2,442	20.3
2a	1,358	2,257	60.1
2b	2,023	2,246	90.1
3	1,152	2,050	56.2
4	344	1,446	23.8
5	311	1,640	19.0
6 and B	601	2,419	24.9
7	662	2,911	22.7
8	176	1,421	12.4
9a	550	1,407	39.1
9b	1,151	2,670	43.1
Missouri	8,823	22,909	38.5

which was accompanied by a slow increase in adequate-income farms. McNamara described this area as having the highest rural-living-level in the state.<sup>52</sup> It seems probable that as high a percentage of youth in this area will be able to farm profitably as in any area in the State in the long-run.

Throughout the state, the percentage of all farm youth who will be able to farm is expected to decline rather steadily throughout the projected period. Table 14 shows that the range in percentage able to farm by areas for the 20-year period to 1975 is from 11.0 in Area 8 to 86.4 in Area 2b. In Area 9b, 100 percent of the farms could be brought up to the adequate income level by 1970 if the recent trend in enlargement were continued. As a result of the decline in number of farms between 1970 and 1975 being greater than the expected number of deaths and retirements among operators, no additional opportunities were expected to be available in that period. This fact accounts for the low percentage of youth who will be able to find adequate farms during the last two five-year periods.

### Opportunities Compared With High-School-Age Farm Boys

While the number of 20-year-old farm males unable to farm is of interest since it indicates the amount of additional out-migration that will be required, the number of 15 to 19-year-olds has greater significance to the public schools. The vocational guidance programs have the greatest impact upon youth of these ages. Under the assumptions of this study, the 15 to 19-year-olds will be seeking opportunities to farm or work after reaching age 20. Table 15 shows that enough adequate farming opportunities were available from 1955 to 1960 for about 22 percent of these farm boys to enter agriculture. The percentage varied from 52.1 in Area 2a, down to only 6.6 percent in Area 8. Similar tables for the other periods to 1975, are shown in the Appendix.

**TABLE 14—PERCENT OF FARM YOUTH ENTERING WORKING AGE EXPECTED TO FIND ADEQUATE FARMING OPPORTUNITIES BY ECONOMIC AREAS IN MISSOURI AND FIVE-YEAR PERIODS, 1955-75**

Economic Area	1955-60	1960-65	1965-70	1970-75	Total 1955-75
1 and A	20.3	17.7	16.1	12.0	16.8
2a	60.2	84.7	76.5	77.4	74.3
2b	90.1	83.7	85.6	85.6	86.4
3	56.2	53.6	50.9	48.2	52.5
4	23.8	21.1	17.8	13.0	19.5
5	19.0	19.3	20.4	19.6	19.5
6 and B	24.9	22.8	22.4	21.5	23.0
7	22.7	24.6	26.9	34.6	26.5
8	12.4	11.2	10.8	8.6	11.0
9a	39.1	34.1	31.4	27.4	33.6
9b	43.1	35.1	15.0	0.	21.5
Missouri	38.5	39.5	36.0	31.5	36.7

<sup>52</sup>See page 11.

**TABLE 15-COMPARISONS OF FARMING OPPORTUNITIES WITH 15-19 YEAR-OLD RURAL-FARM MALES EXPECTED TO LIVE UNTIL AGE 20 IN MISSOURI BY ECONOMIC AREAS, 1950-55**

Economic Area	Number of adequate farming Opportunities*	Number of 15-19 Year-olds to Live to Age 20	Percent Able to find adequate income farms
1 and A	495	3,620	13.7
2a	1,358	3,841	35.4
2b	2,023	3,885	52.1
3	1,152	3,500	32.9
4	344	2,623	13.1
5	311	2,986	10.4
6 and B	601	4,298	14.0
7	662	5,405	12.2
8	176	2,656	6.6
9a	550	2,303	23.9
9b	1,151	4,369	26.3
Missouri	8,823	39,486	22.3

\*Opportunities expected between 1955 and 1960.

The percentage of 15 to 19-year-old boys who will be able to farm is not expected to change greatly according to these calculations. Table 16 shows that, for Missouri, the percentage increased to 25.8 during 1955-60 and is expected to decrease to 20.4 in the period from 1970 to 1975.

**TABLE 16-PERCENT OF 15-19 YEAR-OLD MALES IN THE RURAL-FARM POPULATION EXPECTED TO FIND ADEQUATE FARMING OPPORTUNITIES DURING SUCCEEDING QUINQUENNIUM WHEN READING AGE 20 BY FIVE-YEAR PERIODS, 1950-70**

Economic Area	Percent Able to Farm				Total 1950-70
	1950-55	1955-60	1960-65	1965-70	
1 and A	13.7	13.0	11.2	8.2	11.7
2a	35.4	61.4	47.6	51.0	47.9
2b	52.1	60.8	56.4	56.4	56.1
3	32.9	35.1	33.6	31.4	33.3
4	13.1	12.2	10.6	8.3	11.4
5	10.4	10.9	11.7	12.0	11.1
6 and B	14.0	15.8	15.3	14.4	14.8
7	12.2	14.2	15.6	21.0	15.1
8	6.6	6.4	5.7	5.5	6.2
9a	23.9	21.9	19.2	17.5	21.0
9b	26.3	23.5	9.4	0.	13.7
Missouri	22.3	25.8	22.6	20.4	22.9

Table 17 shows that between 1950 and 1970, a total of 126,447 farm boys will have passed through the 15 to 19-year age group. Since only 28,935 farming opportunities are expected for them when they reach age 20, only 22.9 percent will find adequate-income opportunities on the land. This leaves 97,512 who either must seek other employment or accept poor farming opportunities.

**TABLE 17-RELATIONSHIPS BETWEEN NUMBER OF 15-19 YEAR-OLD FARM BOYS AND ADEQUATE OPPORTUNITIES TO FARM IN MISSOURI BY FIVE-YEAR PERIODS, 1950-70**

Interval	Number of 15-19 Year olds	Number of Adequate Farming Opportunities	Surplus of Boys	Percent to Farm
1950-55	39,486	8,823	30,663	22.3
1955-60	32,052	8,269	23,783	25.8
1960-65	29,275	6,618	22,657	22.6
1965-70	25,634	5,225	20,409	20.4
1950-70	126,447	28,935	97,512	22.9

### Summary

Although migration from the land during the 1940-50 decade caused a great reduction in the number of farm males reaching working age, the rate was not sufficient to bring the number of farm reared boys into balance with opportunities to become well established on farms. Apparently, only 36.7 percent of those reaching age 20 between 1955 and 1975 will be able to find satisfactory opportunities on the land. During those 20 years, if migration were to be maintained at the 1940-50 rates, an additional 78,822 would be forced to choose other employment or accept unsatisfactory opportunities on the land. There is great variation between the areas of the State, with 40 to 90 percent able to farm in the better farming areas and only 10 percent in Area 8.

It is important to become familiar with the conditions that confront 15 to 19-year-old boys since these are the ages when they should be considering their careers. The analysis shows that only 22.9 percent of the 15 to 19-year-old group reaching age 20 between 1955 and 1975 will find adequate-income farming opportunities. Variations by economic areas are similar to those found when comparing the 20-year-olds.

### ENROLLMENTS IN VOCATIONAL AGRICULTURE

The number of departments of vocational agriculture increased in Missouri after World War II to a high of 275 in the 1956-57 school year. In 1959-60 the number was 262. A summary of the situation from 1944-45 to the 1959-60 school year is presented in Table 18. The trend in enrollment has been upward.

### Comparisons of Opportunities with Seniors in Vocational Agriculture

At the time of this study, the number of seniors who were enrolled in vocational agriculture was available from the State Department of Education by schools for only two years, 1958-59 and 1959-60. Since seniors usually have received three or four years of instruction in vocational agriculture, and may be regarded as most nearly prepared for farming, their numbers have been compared with the number of farming opportunities. The number of seniors enrolled in vocational agriculture for the two school years for which data were

available was used to estimate the average number that would be graduating per five-year period. The results were tabulated by economic areas according to location of the school. This procedure made it possible to compare their numbers with the estimated number of farming opportunities in each area. Table 19 shows that during the 1955-60 period, two areas—2a and 2b—had fewer seniors enrolled in vocational agriculture than number of opportunities which were expected. More than three seniors per opportunity are shown in Areas 4 and 8. For the state as a whole there are 1.30 seniors in vocational agriculture for each effective farming opportunity that is likely to be available to them.

**TABLE 18—NUMBER OF DEPARTMENTS OF VOCATIONAL AGRICULTURE  
TOTAL ENROLLMENT, AND AVERAGE ENROLLMENT PER DEPARTMENT  
IN MISSOURI BY SCHOOL YEARS, 1944-45 THROUGH 1959-60\***

School Year	Number of Departments	Total Enrollment	Average Enrollment
1944-45	185	6,770	36.6
1945-46	178	7,025	39.5
1946-47	189	8,223	43.5
1947-48	194	8,506	43.8
1948-49	216	9,395	43.5
1949-50	226	10,208	45.2
1950-51	240	10,874	45.3
1951-52	248	11,187	45.1
1952-53	251	11,142	44.4
1953-54	257	11,506	44.7
1954-55	262	11,585	44.2
1955-56	270	11,733	43.4
1956-57	275	11,703	42.5
1957-58	274	11,907	43.5
1958-59	268	12,075	44.6

\*Carl M. Humphrey, "Annual Report of Vocational Agriculture in Missouri," Agricultural Education, State Department of Education, Jefferson City, Missouri, June, 1959. (Mimeographed) p. 1.

### Problem of Distribution

Because many schools in rural areas do not offer vocational agriculture, a large number of Missouri boys never have the opportunity to receive an education of this type.<sup>53</sup> If farming opportunities most often become available through family assistance, as has been assumed here, then, boys attending schools not offering vocational agriculture courses probably are just as successful in acquiring opportunities in farming as those who have received this type of education.

In the earlier study, the assumption was made that schools of similar size would have a similar percentage of their enrollment taking vocational agricul-

<sup>53</sup>Earl T. Carpenter, "An Estimation of the Extent of Opportunities for Missouri Farm Boys to Take Vocational Agriculture in Missouri Public Schools," Department of Agricultural Education, University of Missouri, Columbia, June, 1959. (Mimeographed.)

ture, if it were offered in all schools. Schools offering vocational agriculture were grouped by size, and the percentage enrolled in vocational agriculture during the 1958-59 school year was determined. This percentage was then applied to the enrollments of schools of similar size not offering the courses, to estimate the number who would be expected to take the courses if they were offered. Schools known to enroll very few farm students were excluded from the study. The results were tabulated by the county in which the school was located, and by type of farming area in Missouri.<sup>54</sup>

County totals have been re-grouped by economic areas for this study. Table 20 shows that there is a slight tendency for the poorer farming areas to provide a higher percentage of their students with the opportunity to take vocational agriculture than the good farming areas. Figures for Area 7, where the soils are relatively unproductive, particularly emphasize this fact.

Without doubt, the assumption of a similar enrollment in vocational agriculture in schools of similar size is subject to some error. It does, however, permit an estimate of the proportion of all farm boys who were enrolled in vocational agriculture. If those students not offered the courses are successful in claiming farming opportunities, then, their numbers become important in evaluating the chances of seniors in vocational agriculture to gain control of a farm business.

TABLE 19-COMPARISONS OF NUMBER OF FARMING OPPORTUNITIES WITH NUMBER OF SENIORS IN VOCATIONAL AGRICULTURE, BY ECONOMIC AREAS IN MISSOURI, 1955-60

Economic Area	Opportunities	Seniors*	Seniors per Opportunity
1 and A	415	1,095	2.64
2a	1,891	1,403	.74
2b	1,863	1,228	.66
3	1,006	1,080	1.07
4	253	883	3.49
5	260	630	2.42
6 and B	531	880	1.66
7	604	1,410	2.33
8	132	608	4.61
9a	433	550	1.27
9b	881	975	1.11
Missouri	8,269	10,742	1.30

\*The number of seniors enrolled in vocational agriculture during the two years, 1958-59 and 1959-60, was multiplied by 2.5 to give the approximate number of seniors for the five-year period from 1955-60.

For example, if, as in Area 3, about one-half of the farm boys are not offered vocational agriculture and if they command one-half of the opportunities, then, only one-half of the opportunities will be available to graduates with vocational agriculture training. To the extent this reasoning is correct, Table 21 shows the

<sup>54</sup>*Ibid.*

number of opportunities likely to become available to seniors in vocational agriculture. The number of graduates with this training will total 4,941 between 1960 and 1965 in Missouri. With 10,742 seniors expected in the five-year period, this number amounts to 2.17 seniors per farming opportunity. Again, there is a wide variation among areas, with a high of 11.26 seniors per opportunity in Area 8 and 1.14 in Area 2b.

TABLE 20-COMPARISONS BETWEEN THE NUMBER OF STUDENTS ENROLLED IN VOCATIONAL AGRICULTURE, WITH THE NUMBER OF POTENTIAL STUDENTS NOT OFFERED THE COURSES BY ECONOMIC AREAS IN MISSOURI, 1958-59

Economic area	Students of Voc. Agr.	Potential Students*	Total	Percent of Total in Voc. Agr.
1 and A	1,186	1,326	2,512	47.2
2a	1,390	1,043	2,433	57.1
2b	1,263	928	2,191	57.6
3	1,103	1,095	2,198	50.2
4	931	592	1,523	61.1
5	799	615	1,414	56.5
6 and B	984	925	1,909	51.5
7	1,752	591	2,343	74.8
8	656	944	1,600	41.0
9a	714	188	902	79.2
9b	1,222	402	1,624	75.2
Missouri	12,000	8,649	20,649	58.1

\*Potential students were determined under the assumption of similar vocational agriculture enrollments in schools of similar size. The number of potential students was determined in an earlier study by counties. These estimates have been grouped by economic areas.

TABLE 21-NUMBER OF SENIORS ENROLLED IN VOCATIONAL AGRICULTURE IN MISSOURI AND NUMBER OF ADEQUATE FARMING OPPORTUNITIES EXPECTED TO BE AVAILABLE TO THEM, 1960-65

Economic Area	(1960-65) Opportunities	Percent Available to Voc. Agr. Students	Number Available to Voc. Agr. Students	Number of Voc. Agr. Seniors	Voc. Agr. Seniors per Opportunity
(1)	(2)	(3)	(4)	(5)	(6)
1 and A	415	47.2	196	1,095	5.59
2a	1,891	57.1	1,080	1,403	1.30
2b	1,863	57.6	1,073	1,228	1.14
3	1,006	50.2	505	1,080	2.14
4	253	61.1	155	883	5.70
5	260	56.5	147	630	4.29
6 and B	531	51.5	283	880	3.22
7	604	74.8	452	1,410	3.12
8	132	41.0	54	608	11.26
9a	433	79.2	343	550	1.60
9b	881	75.2	663	975	1.47
Missouri	8,269	59.8	4,941	10,742	2.17

Relationships in Table 21 are the results of: (1) variations between areas in numbers of farming opportunities expected and (2) variations between areas in the percentage of farm boys who attend schools offering vocational agriculture. While farming opportunities vary with the quality of farmland, the presence of vocational agriculture departments in high schools seems to be dependent upon other factors.

Column 2 of Table 21 shows that the number of farming opportunities is closely related to the amount of good farmland in an area. Areas 2a, 2b and 3, for example, account for more than one-half of the opportunities in the State. These areas, located in North Central, Northeast and West Central Missouri also include a large share of the productive farmland.

Column 3 of Table 21 shows that the percentage of farm boys attending schools offering vocational agriculture tends to vary inversely with the number of farming opportunities. Only in Areas 4, 7, 9a, and 9b do more than 60 percent of the farm boys have the opportunity to receive instruction in vocational agriculture. With the exception of Area 9b in the Delta, these areas contain relatively few opportunities to farm, and they have relatively small acreages of productive farmland.

Note in Column 6 of Table 21 that large numbers of farm boys with poor prospects of obtaining an adequate farm are receiving instruction in vocational agriculture through the senior year. This is particularly true of the poorer farming areas of the State, notably Areas 4, 5, 6, and B, 7, and 8.

While this analysis has shown a numerical relationship between farming opportunities and seniors in vocational agriculture by economic areas, it has not accounted for unequal distribution of these students within economic areas. The procedures used in estimating the number of opportunities seem more appropriate for large areas than for local communities. To determine the number of farming opportunities in a given community, an intensive local study would seem to be much more fruitful. Evidence of the uneven distribution of departments of vocational agriculture may be observed, however, from the number of students in individual counties who are not able to take the courses. This information is presented in Figure 2.<sup>55</sup> In 28 of the 114 counties, more than 60 percent of the probable students of vocational agriculture are attending schools which do not offer the courses. Most areas of the state show considerable variation from one county to another in the percentage of probable students not offered the courses.

### Enrollment in Vocational Agriculture (Summary)

Although the number of seniors in vocational agriculture for a five-year period in Missouri (10,742), is similar to the number of farming opportunities which were calculated for 1960 to 1965 (8,269), this close relationship does not mean that a high percentage of the seniors will find an adequate farming op-

<sup>55</sup>Carpenter, *op. cit.*, p. 5.

portunity. There is great variation, geographically, in the relationship between boys receiving training and adequate opportunities to farm. Even individual counties are subject to the problem of poor distribution of departments. So long as there are farm boys not taking vocational agriculture, it seems certain that some of the opportunities to farm will go to such boys.

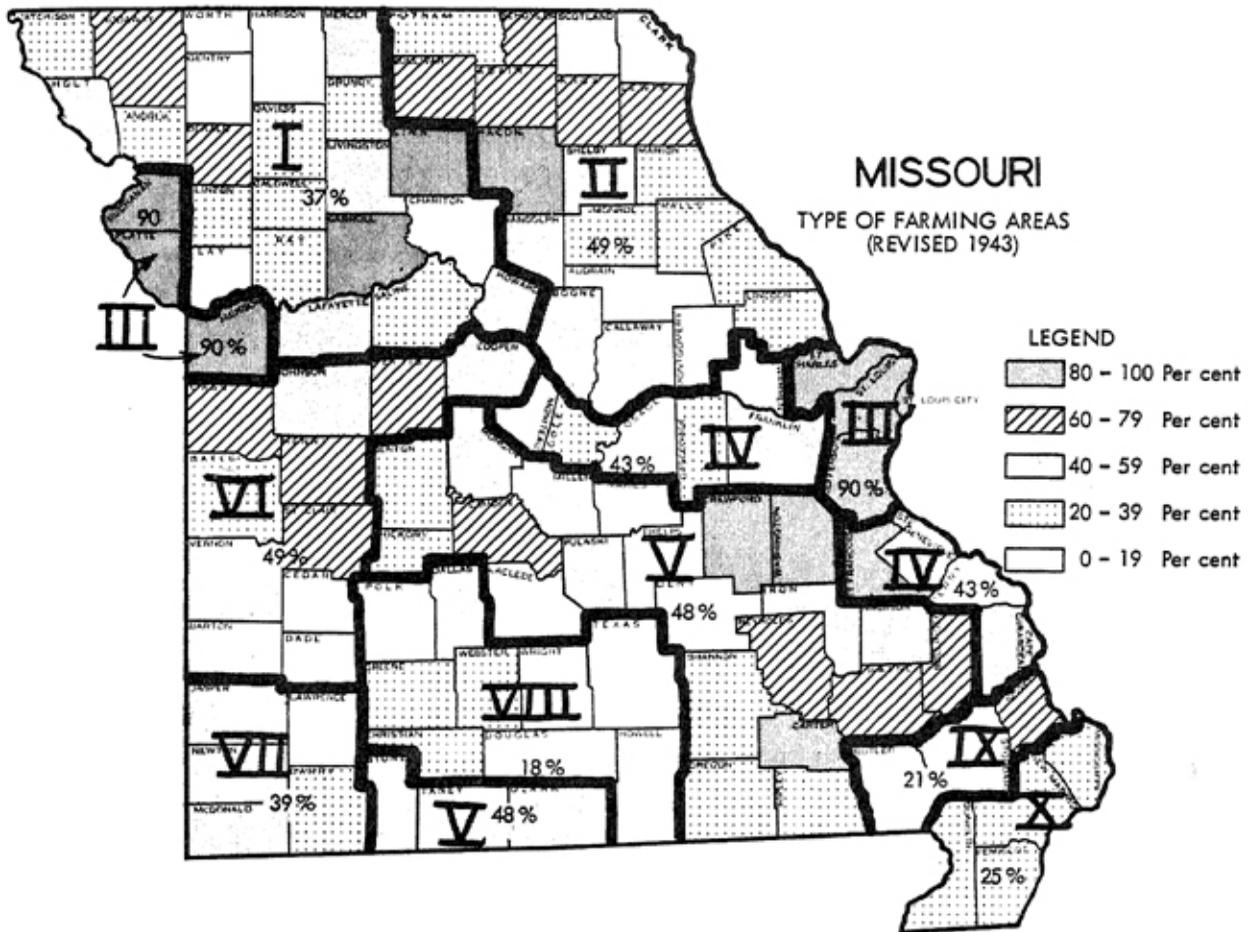


Figure 2-Percentages of Total Probable Students of Vocational Agriculture Attending Schools not Offering Vocational Agriculture by Counties and Farming Areas.

When it was assumed that opportunities would be distributed proportionately between former students of vocational agriculture and other young men in the farm population, it was found that the number of seniors in vocational agriculture for a five-year period was slightly more than twice the expected number of adequate-farming opportunities for the 1960-65 quinquennium. The range was from 1.14 seniors per opportunity in Area 2b to 11.26 in Area 8.

This analysis of adequate farming opportunities and number of students being graduated from vocational agriculture departments shows the extent of imbalance between the supply of trained young men and the demand for farms in the various economic areas of Missouri. If out-migration is maintained at the

1940-50 rate, 63.3 percent of the Missouri farm boys reaching age 20 between 1955 and 1975, will not be able to find adequate opportunities in agriculture. The range by areas for the 20-year period will be from 11.0 percent in Area 8, to 86.4 percent of the boys in Area 2b who will find opportunities to farm.

When the number of opportunities was compared with the number of 15 to 19-year-old farm boys, it was found that only 22.9 percent would be expected to find adequate farming opportunities between 1955 and 1975. Again, a wide range was shown by areas.

The number of seniors in classes of vocational agriculture was found to be similar to the number of opportunities to farm. The unsatisfactory distribution of departments offering this training throughout the state, however, greatly limits the possibilities of placing trained men on farms. The number of seniors per opportunity likely to become available to them, was found to vary from a low of 1.14 in Economic Area 2b, to a high of 11.26 in Area 8. For Missouri, it was calculated that 2.17 seniors would be enrolled in vocational agriculture in the 1960-65 five-year period for each adequate-farming opportunity expected to be available to these young men.

## Chapter V

### INTERPRETING THIS STUDY

#### RESULTS

##### Changes in Acreage for Commercial Agriculture

Commercial farms include all farms except those classified as part-time, residential, or abnormal by the Census. From the Missouri portion of the National Inventory of Soil and Water Conservation Needs, it was found that the acreage of land in commercial agriculture was expected to increase 0.47 percent between 1955 and 1975. The percentage change varied by economic areas from an expected decrease of 1.61 percent in Area 7 in southern Missouri, to an increase of 4.40 percent in Area 9b, which lies in southeastern Missouri. By 1975, an additional 115,908 acres are expected to be available for commercial agriculture in the State.

##### Changes in Numbers of Commercial Farms

A decrease is expected in number of commercial farms from the 164,600 reported in the 1950 Census to 86,416 by 1975. This is a decrease of 47.5 percent. Every economic area is expected to have a substantial reduction in the number of commercial farms.

##### Changes in Numbers of Adequate-Income Farms

For Missouri, the number of adequate-income farms (commercial farms having sales of \$5000 or more per year) is expected to increase from the 38,561 reported in the 1950 Census to 51,472 in 1975.

## Numbers of Entry Opportunities

Entry opportunities in farming totaled 8,823 between 1955 and 1960. The projections showed reductions for each subsequent five-year period to 5,255 between 1970 and 1975. The number of opportunities is expected to vary greatly by areas. Between 1960 and 1965 only 132 opportunities are expected in Economic Area 8, which lies in the southeastern Ozarks, while Areas 2a and 2b, in north central and northeast Missouri show well over 1800 opportunities for the same period. Generally, areas with a high proportion of good farmland are expected to have larger numbers of farming opportunities than the relatively unproductive areas.

## Farm Males Entering Working Age Compared with Opportunities

Between 1950 and 1955, a total of 28,199 young men in the Missouri farm population became 20 years of age. Using 1950 death rates and 1940-50 migration rates, the number to reach age 20 while in the farm population is shown to decline during each succeeding period to 16,578 for the 1970-75 interval.

When those entering working age were compared with opportunities to farm, it was found that 38.5 percent could have found satisfactory businesses in the 1955-60 period. This percentage increased to 39.5 percent in the next quinquennium, but, by the 1970-75 period, only 31.5 percent will be expected to find satisfactory opportunities. Much variation was found throughout the state with opportunities in northern Missouri generally much higher than those in the rest of the state.

## Comparisons with Enrollments in Vocational Agriculture

Opportunities were assumed to be distributed proportionately between students of vocational agriculture and other boys in the farm population. On this basis, 4,941 opportunities were estimated to be available during 1960-65 to students who had been seniors in vocational agriculture during the preceding five-year period. This number compares with 10,742 seniors enrolled in vocational agriculture for the five-year period. In other words, for the state, about 2.17 boys are being educated in vocational agriculture through the senior year for each opportunity in farming under the assumptions of this study. The variation throughout the State was from 1.14 boys in Area 2b, in Northeastern Missouri, to 11.26 seniors in vocational agriculture, in Area 8 in the Southeastern Ozark Region.

## ANALYSIS OF RESULTS

Results of this study seem generally consistent with reality. In most instances tables have included data for the 1950 to 1955 period, and these may be regarded as close approximations to actual numbers for that period.

In Economic Area 1 and A, in northwest Missouri, a large increase in average farm-size was noted between 1950 and 1955. For this area there was not a correspondingly large increase in the percentage of the total commercial farms

that were adequate-income farms. As a result, this area showed relatively few farming opportunities throughout the projection period.

At best, the estimates are approximations. They may be more accurate for the state than for individual economic areas. Much work needs to be done in collecting more complete data, by economic class of farm, and in identifying criteria for predicting the extent of changes, before more reliable estimates will be possible.

### CONCLUSIONS

To the extent that the assumptions used in this study are valid, the following conclusions seem justified:

1. The number of adequate opportunities to begin farming in Missouri will decline significantly by 1975. Even so, large numbers of farm boys will continue to find satisfactory opportunities in agriculture.
2. Much variation will exist between areas of the state in the number of opportunities to farm, in the percent of all farm boys who will find satisfactory opportunities, and in the percentage of graduates in vocational agriculture who will find satisfactory opportunities.
3. The distribution of opportunities will tend to vary directly with the productivity of the soil.
4. The location of departments of vocational agriculture is not consistent with the distribution of opportunities to farm.

### IMPLICATIONS

The findings of this study add emphasis to the need for extending programs of vocational guidance in the rural high schools of Missouri. Furthermore, some promising criteria have been identified for deciding which boys should be encouraged to farm. The likelihood of substantial family assistance should become an important criterion in deciding whether or not a boy should prepare for a farming career. The increased use of technology and the resultant advance in capital requirements suggest that ability to learn new practices and to manage a farm business should become other criteria for deciding who will most likely succeed as farmers.

Teachers of vocational agriculture should counsel with students and advise them regarding their chances for success in farming. The beginning courses can be used for this purpose.

The number of boys encouraged to prepare for farming careers should be reasonably consistent with the number of adequate opportunities to farm in the local community. There is great need for other forms of vocational training to prepare farm-reared boys for non-farm careers. The need is most intense in the poor soil areas of the State.

Great effort should be exerted to improve the location of vocational agriculture departments and courses in scientific farming throughout rural Missouri.

This work should include: provisions for part-time programs at the same time, remedying the features deemed to be objectionable, relocation of departments to get more nearly uniform distribution according to need, special use of funds to encourage new departments needed and closing departments that cannot be justified.

Farm business management should be emphasized in the curriculum. The adult education program needs to be expanded to keep farms abreast of technical developments.

Each farm boy should have the opportunity to attend a school offering a vocational program designed to prepare him for occupational success. Therefore, reorganization of school districts and changes in the curriculum should be encouraged to provide complete programs of vocational education at reasonable cost per pupil.

Non-farming employment opportunities and the possibilities of combining part-time farming and off-farm work should be emphasized.

Success factors in farming need to be isolated through further study. Knowledge of them will contribute to more effective vocational guidance and wiser selection of course content in vocational agriculture.

## APPENDIX

TABLE 22-ESTIMATED PERCENTAGE CHANGE IN "FARMLAND" IN MISSOURI  
BY ECONOMIC AREAS BETWEEN 1955 AND 1975\*

Economic Areas	1955			1975			Change in "Farmland"	% Change
	Inventory** Acreage	Forest & Woodland	"Farm-land"***	Inventory** Acreage	Forest & Woodland	"Farm-land"***		
1 and A	4,332,492	397,065	3,925,427	4,245,549	302,078	3,943,471	18,044	.46
2a	5,279,152	675,157	4,603,995	5,259,666	540,896	4,718,770	114,775	2.49
2b	5,600,169	955,555	4,644,614	5,551,176	873,833	4,677,343	32,729	.70
3	4,610,961	695,960	3,915,001	4,539,272	674,972	3,864,300	-50,701	-1.30
4	1,914,239	602,963	1,311,276	1,908,907	610,857	1,298,050	-13,226	-1.01
5	4,101,367	2,419,363	1,682,004	4,006,374	2,348,279	1,658,095	-23,909	-1.42
6 and B	4,242,496	1,743,741	2,502,755	4,153,705	1,656,569	2,497,136	-5,619	-.22
7	4,894,672	2,393,595	2,501,077	4,869,332	2,408,619	2,460,713	-40,364	-1.61
8	3,514,464	2,629,353	885,111	3,496,174	2,601,811	894,363	9,252	1.04
9a	1,149,350	228,298	921,052	1,142,952	183,096	959,856	38,804	4.21
9b	1,288,532	1,102,832	1,185,700	1,284,017	46,187	1,237,830	52,130	4.40
Missouri	40,921,894	12,843,882	28,078,012	40,457,124	12,247,197	28,209,927	131,915	.47

\*Acreages were taken from preliminary reports of the Missouri portion of the Inventory of Soil and Water Conservation Needs. Data were available by counties and were totaled by economic areas.

\*\*Inventory acreage is the total land area as listed by the Census, less federal and urban and built-up areas, and those water areas which had not been excluded by the Census.

\*\*\*Inventory acreage less forest and woodland. This acreage is similar to the total of crop and pasture land as reported by the Census.

TABLE 23-ESTIMATED ACREAGE OF FARMLAND IN COMMERCIAL FARMS IN MISSOURI BY ECONOMIC AREAS IN 1955\*

Economic Area	Cropland (1)	Other Pasture (2)	Total Farmland** (3)
I and A	2,596,417	714,713	3,311,130
2a	2,559,744	1,397,176	3,956,920
2b	2,807,811	873,329	3,681,140
3	2,145,391	1,018,831	3,164,222
4	707,121	227,196	934,317
5	791,926	313,806	1,105,732
6 and B	1,440,518	268,653	1,709,171
7	1,279,336	543,458	1,822,794
8	404,911	115,660	520,571
9a	646,110	26,225	672,335
9b	947,005	13,960	960,965
Missouri	16,326,290	5,513,007	21,839,297

\*For this study, farmland has been defined as cropland plus pasture land. Data in columns (1) and (2) are from the Census of Agriculture: 1954.

\*\*These acreages of farmland differ from those in Table XXII. The differences are approximately equal to the acreage in part-time and residential farms. In addition, some land not in farms was included in the Conservation Needs Inventory.

TABLE 24-ESTIMATED ACREAGE OF FARMLAND TO BE IN COMMERCIAL FARMS BY ECONOMIC AREAS OF MISSOURI AT FIVE-YEAR INTERVALS 1955-75

Economic Area	1955 (1)	1960 (2)	1965 (3)	1970 (4)	1975 (5)
I and A	3,311,130	3,314,878	3,318,626	3,322,374	3,326,120
2a	3,956,920	3,981,552	4,006,184	4,030,816	4,055,447
2b	3,681,140	3,687,582	3,694,024	3,700,466	3,706,908
3	3,164,222	3,153,938	3,143,654	3,133,370	3,123,088
4	934,317	931,958	929,599	927,240	924,881
5	1,105,732	1,101,807	1,097,882	1,093,957	1,090,031
6 and B	1,709,171	1,708,231	1,707,291	1,706,351	1,705,411
7	1,822,794	1,815,457	1,808,120	1,800,783	1,793,447
8	520,571	521,925	523,279	524,633	525,985
9a	672,335	679,411	686,487	693,563	700,640
9b	960,965	971,536	982,107	992,678	1,003,247
Missouri	21,839,297	21,868,275	21,897,253	21,926,231	21,955,205

Column (1) was taken from Table 23

Column (5) was determined by multiplying the percentages obtained in Table 22, by the acreage in Column (1). The change in acreage was then distributed uniformly among the four periods.

TABLE 25-ESTIMATED TREND IN SIZE OF COMMERCIAL FARMS IN MISSOURI  
BY ECONOMIC AREAS BETWEEN 1950 AND 1955

Economic Area	1950			1955			% Increase in Acres per farm (1955 over 1950) (7)
	Acres of Farmland (1)	No. of Com'l Farms (2)	Acres per Farm (3)	Acres of Farmland (4)	No. of Com'l Farms (5)	Acres per Farm (6)	
1 and A	3,392,277	21,102	161	3,311,130	17,818	186	15.5
2a	3,990,843	24,051	170	3,956,920	21,019	188	10.5
2b	3,631,898	21,177	172	3,681,140	19,387	190	10.4
3	3,199,633	19,384	165	3,164,222	16,779	189	12.6
4	945,696	9,259	102	934,317	7,602	123	20.5
5	1,142,491	9,666	118	1,105,732	8,270	134	13.5
6 and B	1,801,128	16,379	110	1,709,171	14,056	122	10.9
7	1,991,238	19,301	103	1,822,794	16,092	113	9.7
8	573,105	5,818	99	520,571	4,386	119	20.2
9a	679,048	6,744	101	672,335	5,583	120	18.8
9b	1,010,608	11,719	86	960,965	9,315	103	19.7
Missouri	22,357,965	164,600	136	21,839,297	140,307	156	14.7

Columns (1) and (4) report the sum of crop and pasture land acreages as found in the Census of Agriculture for the two Census years.

Columns (2) and (5) report the number of commercial farms as found in the Census of Agriculture.

Column (3) was obtained by dividing column (1) by column (2). Similarly, column (6) was obtained by dividing column (4) by column (5).

TABLE 26-FARMLAND PER COMMERCIAL FARM IN MISSOURI IN  
1950 and 1955, AND ESTIMATED TO 1975 BY ECONOMIC  
AREAS AT FIVE-YEAR INTERVALS\*

Economic Area	1950 (1)	1955 (2)	1960 (3)	1965 (4)	1970 (5)	1975 (6)
1 and A	161	186	215	248	286	330
2a	170	188	208	230	254	281
2b	172	190	210	232	256	283
3	165	189	213	240	270	304
4	102	123	148	178	214	258
5	118	134	152	173	196	222
6 and B	110	122	135	150	166	184
7	103	113	124	136	149	163
8	99	119	143	172	207	249
9a	101	120	143	170	202	240
9b	86	102	123	147	176	211
Missouri	136	156	*	*	*	*

Columns (1) and (2) were taken from Table 25.

Column (3) was obtained by increasing column (2) by the percentages determined in Table 25.

Columns (4), (5), and (6), were similarly derived by increasing the adjacent preceding column.

\*Determined by dividing totals for Missouri as found in Table 27.

TABLE 27-ESTIMATED NUMBER OF COMMERCIAL FARMS IN MISSOURI BY ECONOMIC AREAS AT FIVE-YEAR INTERVALS, 1960-75

Economic Area	1960			1965			1970			1975		
	Total Acres of farmland (1)	A. of Farm-land per com'l farm (2)	Est'd # of com'l farms (3)	Total Acres of farmland (4)	A. of Farm-land per com'l farm (5)	Est'd # of com'l farms (6)	Total Acres of farmland (7)	A. of Farm-land per com'l farm (8)	Est'd # of com'l farms (9)	Total Acres of farmland (10)	A. of Farm-land per com'l farm (11)	Est'd # of com'l farms (12)
1 and A	3,314,878	215	15,418	3,318,626	248	13,382	3,322,374	286	11,617	3,326,120	330	10,079
2a	3,981,552	208	19,142	4,006,184	230	17,418	4,030,816	254	15,869	4,055,467	281	14,432
2b	3,687,582	210	17,560	3,694,024	232	15,923	3,700,466	256	14,455	3,706,908	283	13,099
3	3,153,938	213	14,807	3,143,654	260	13,099	3,133,370	270	11,605	3,123,088	304	10,273
4	931,958	148	6,297	929,599	178	5,222	927,240	214	4,333	924,881	258	3,585
5	1,101,807	152	7,249	1,097,882	173	6,346	1,093,957	196	5,581	1,090,031	222	4,910
6 and B	1,708,231	135	12,653	1,707,291	150	11,382	1,706,331	166	10,279	1,705,411	184	9,269
7	1,815,457	124	14,641	1,808,120	136	13,295	1,800,783	149	12,086	1,793,447	163	11,003
8	521,925	143	3,650	523,279	172	3,042	526,633	207	2,534	525,985	249	2,112
9a	679,411	143	4,751	686,487	170	4,038	693,563	202	3,433	700,640	240	2,919
9b	971,536	123	7,899	982,107	147	6,681	992,678	176	5,640	1,003,247	211	4,755
Missouri	21,868,275		124,067	21,897,253		109,828	21,926,231		97,432	21,955,205		86,436

Columns (1), (4), (7), and (10), were taken from Table XXIV. Columns (2), (5), (8), and (11), were taken from Table 26. Estimated numbers of commercial farms were determined by dividing the total acres of farmland by the acres of farmland per commercial farm.

TABLE 28-ESTIMATED PERCENTAGE OF COMMERCIAL FARMS THAT WILL PROVIDE ADEQUATE INCOMES BY ECONOMIC AREAS IN MISSOURI, FIVE-YEAR INTERVALS 1950-1975

Economic Area	1950			1955			Increase in % Adequate-Inc. (7)	Est'd % Adeq-Income 1960 (8)	Est'd % Adeq-Income 1965 (9)	Est'd % Adeq-Income 1970 (10)	Est'd % Adeq-Income 1975 (11)
	# of Com'l Farms (1)	# of Adeq-In-come Farms (2)	% Adequate-Income (3)	# of Com'l Farms (4)	# of Adeq-In-come Farms (5)	% Adequate-Income (6)					
1 and A	21,102	7,991	37.9	17,818	7,584	42.6	4.7	47.3	52.0	56.7	61.0
2a	24,051	5,741	23.9	21,019	6,695	31.9	8.0	39.9	47.9	55.9	63.9
2b	21,177	6,026	28.5	19,387	7,590	39.1	10.6	49.7	60.3	70.9	81.5
3	19,384	4,568	23.6	16,779	5,281	31.5	7.9	39.4	47.3	55.2	63.1
4	9,259	1,345	14.5	7,602	1,636	21.5	7.0	28.5	35.5	42.5	49.5
5	9,666	1,297	13.4	8,270	1,480	17.9	4.5	22.4	26.9	31.4	35.9
6 and B	16,379	3,494	21.3	14,056	3,606	25.7	4.4	30.1	34.5	38.9	43.3
7	19,301	1,781	9.2	16,092	2,142	13.3	4.1	17.4	21.5	25.6	30.7
8	5,818	408	7.0	4,386	547	12.5	5.5	18.0	23.5	29.0	34.5
9a	6,744	1,498	22.2	5,583	1,961	35.1	12.9	48.0	60.9	73.8	86.7
9b	11,719	4,412	37.6	9,315	5,085	54.6	17.0	71.6	88.6	100.0	100.0
Missouri	164,600	38,561	23.4	140,307	43,607	31.1	7.7	38.8	46.5	54.2	61.9

Columns (1) and (4), are taken from the Census of Agriculture: 1954. Columns (2) and (5) are built-up totals of Economic Class I, II, and III farms taken from the Census of Agriculture: 1954. The sum of entries in columns (6) and (7), is equal to the entry in column (8). The entry in column (7) was added to columns (6), (8), and each succeeding column.

TABLE 29-ESTIMATED NUMBER OF ADEQUATE-INCOME FARMS IN MISSOURI  
BY ECONOMIC AREAS AT FIVE-YEAR INTERVALS, 1960-1975

Economic Area	1960		1965		1970		1975	
	Est'd # Com'l Farms (1)	# Adeq.- Income (2)	Est'd # Com'l Farms (3)	# Adeq.- Income (4)	Est'd # Com'l Farms (5)	# Adeq.- Income (6)	Est'd # Com'l Farms (7)	# Adeq.- Income (8)
1 and A	15,418	7,293	13,382	6,957	11,617	6,587	10,079	6,148
2a	19,142	7,300	17,418	8,343	15,869	8,871	14,432	9,222
2b	17,560	8,727	15,923	9,602	14,455	10,249	13,099	10,676
3	14,807	5,834	13,099	6,196	11,605	6,406	10,273	6,482
4	6,297	1,795	5,222	1,854	4,333	1,842	3,585	1,775
5	7,249	1,624	6,346	1,707	5,581	1,752	4,910	1,763
6 and B	12,653	3,809	11,382	3,927	10,279	3,999	9,269	4,013
7	14,641	2,548	13,295	2,858	12,086	3,094	11,003	3,378
8	3,650	657	3,042	715	2,534	735	2,112	729
9a	4,751	2,280	4,038	2,459	3,433	2,534	2,919	2,531
9b	7,899	5,656	6,681	5,919	5,640	5,640	4,755	4,755
Missouri	124,067	47,523	109,828	50,537	97,432	51,709	85,436	51,472

Column (1), (3), (5) and (7), give commercial farms as determined in Table 27.

Data in columns (2), (4), (6) and (8) were obtained by applying the percentages determined in Table 28 to the number of commercial farms.

TABLE 30-DEATH RATES AMONG THE MALE-WHITE POPULATION OF MISSOURI BY AGE GROUPS, 1950

Ages	Male-White Population (1)	Deaths (2)	Deaths per 1000 Person- 1 year (3)	Deaths per 1000 Persons- 5 years (4)
Under 5	180,888	1,412	7.80	39.00
5-9	151,321	90	0.59	2.95
10-14	130,884	84	0.64	3.20
15-19	123,551	158	1.27	6.35
20-24	123,790	232	1.87	9.35
25-34	255,580	471	1.84	9.20
35-44	250,541	862	3.44	17.20
45-54	218,949	2,020	9.22	46.10
55-64	179,621	3,930	21.87	109.35

Entries in column (1) were taken from the 1950 Census of Population.

Entries in column (2) were taken from Vital Statistics for Missouri: 1950.

TABLE 31-PERCENTAGE DISTRIBUTION OF ADEQUATE-INCOME FARMERS BY AGE GROUPS\*

Ages	Percent In Age Group
Under 25	2.4
25-34	20.1
35-44	29.2
45-54	25.1
55-64	16.0
65 and over	7.0
Total	100.0

\*Percentages were calculated from Table IV: Farm Operators by Age and by Economic Class of Farm for the United States: 1950, in Farms and Farm People, Bureau of the Census; 1953.



<u>Area 5</u>																									
0-5	3108	121	2987	209	2778	2771**	108	2663	186	2477	xxx	7	2470	342	2128										
5-9	3320	10	3310	458	2852	2778	8	2770	384	2386	2477	8	2378	724	1654	2128	7	2121	646	1475					
10-14	3471	11	3460	1054	2406	2852	9	2843	866	1977	2386	8	2378	724	1654	2128	7	2121	646	1475					
15-19	3005	19	2986	938	2048	2406	15	2391	751	1640	1977	13	1964	617	1347	1654	11	1643	516	1127	1475	9	1466	460	1006
Entering Age 20						2048					1640					1347					1127				1006
<u>Area 6 &amp; B</u>																									
0-5	4485	175	4310	----	4310	4161**	162	3999	---	3999	xxx	12	3987	275	3712										
5-9	4556	13	4543	313	4230	4310	13	4297	296	4001	3999	12	3987	275	3712										
10-14	4397	14	4383	1011	3372	4230	14	4216	972	3244	4001	13	3988	919	3069	3712	12	3700	853	2847					
15-19	4325	27	4298	1195	3103	3372	21	3351	932	2419	3244	21	3223	896	2327	3069	19	3050	848	2202	2847	18	2829	786	2043
Entering Age 20						3103					2419					2327			8		2202				2043
<u>Area 7</u>																									
0-5	5706	223	5483	384	5099	5046**	197	4849	339	4510	xxx	13	4497	623	3874										
5-9	6039	18	6021	834	5187	5099	15	5084	704	4380	4510	13	4497	623	3874										
10-14	6159	20	6139	1869	4270	5187	17	5170	1574	3596	4380	14	4366	1329	3037	3874	12	3862	1176	2686					
15-19	5440	35	5405	1697	3708	4270	27	4243	1332	2911	3596	23	3573	1122	2451	3037	19	3018	948	2070	2686	17	2669	838	1831
Entering Age 20						3708					2911					2451									1831
<u>Area 8</u>																									
0-5	2495	97	2398	168	2230	2298**	90	2208	155	2053	xxx	6	2047	284	1763										
5-9	2916	9	2907	403	2504	2230	7	2223	308	1915	2053	6	2047	284	1763										
10-14	3006	10	2996	912	2084	2504	8	2496	760	1736	1915	6	1909	581	1328	1763	6	1757	535	1222					
15-19	2673	17	2656	834	1822	2084	13	2071	650	1421	1736	11	1725	542	1183	1328	8	1320	414	906	1222	8	1214	381	833
Entering Age 20						1822					1421					1183					906				833
<u>Area 9a</u>																									
0-5	2735	107	2628	192	2436	2445**	95	2350	172	2178	xxx	6	2172	281	1891										
5-9	2845	8	2837	367	2470	2436	7	2429	315	2114	2178	6	2172	281	1891										
10-14	2739	9	2730	744	1986	2470	8	2462	671	1791	2114	7	2107	574	1533	1891	6	1885	514	1371					
15-19	2318	15	2303	661	1642	1986	13	1973	566	1407	1791	11	1780	511	1269	1533	10	1523	437	1086	1371	9	1362	391	971
Entering Age 20						1642					1407					1269					1086				971
<u>Area 9b</u>																									
0-5	5539	216	5323	389	4934	4982**	194	4788	349	4439	xxx	13	4426	573	3853										
5-9	5625	17	5608	726	4882	4934	15	4919	637	4282	4439	13	4426	573	3853										
10-14	5198	17	5181	1412	3769	4882	16	4866	1326	3540	4282	14	4268	1163	3105	3853	12	3841	1047	2794					
15-19	4397	28	4369	1254	3115	3769	24	3745	1075	2670	3540	22	3518	1010	2508	3105	20	3085	885	2200	2794	18	2776	797	1979
Entering Age 20						3115					2670					2508					2200				1979
<u>Missouri</u>																									
0-5	43696	1705	41991	2355	39636	39408**	1537	37871	2114	35757	xxx	104	35653	3921	31732										
5-9	45389	134	45255	5026	40229	39636	118	39518	4352	35166	35757	104	35653	3921	31732										
10-14	44154	142	44012	11756	32256	40229	130	40099	10637	29462	35166	114	35052	9255	25797	31732	102	31630	8352	23278					
15-19	39739	253	39486	11287	28199	32256	204	32052	9143	22909	29462	187	29275	8314	20961	25797	163	25634	7260	18374	23278	149	23129	6551	16578
Entering Age 20						28199					22909					20961					18374				16578

\* U. S. Census

\*\* Estimated

TABLE 33-COMPARISON OF THE NUMBER OF OPPORTUNITIES TO FARM WITH THE NUMBER OF RURAL-FARM MALES ENTERING WORKING AGE BY ECONOMIC AREAS OF MISSOURI, 1960-1965

Economic Area	Number of Opportunities	Number of Rural-Farm Males Entering Age 20	Percent to Find Opportunities
1 and A	415	2,343	17.71
2a	1,891	2,233	84.68
2b	1,863	2,225	83.73
3	1,006	1,876	53.62
4	253	1,199	21.10
5	260	1,347	19.30
6 and B	531	2,327	22.81
7	604	2,451	24.64
8	132	1,183	11.15
9a	433	1,269	34.12
9b	881	2,508	35.12
Missouri	8,269	20,961	39.45

TABLE 34-COMPARISON OF NUMBER OF OPPORTUNITIES TO FARM WITH THE NUMBER OF RURAL-FARM MALES ENTERING WORKING AGE BY ECONOMIC AREAS OF MISSOURI, 1965-70

Economic Area	Number of Opportunities	Number of Rural-Farm Males Entering Age 20	Percent to find Opportunities
1 and A	343	2,134	16.07
2a	1,451	1,896	76.53
2b	1,711	1,998	85.63
3	881	1,730	50.93
4	182	1,025	17.76
5	230	1,127	20.40
6 and B	494	2,202	22.43
7	556	2,070	26.85
8	98	906	10.81
9a	341	1,086	31.39
9b	331	2,200	15.04
Missouri	6,618	18,374	36.01

TABLE 35-COMPARISON OF NUMBER OF OPPORTUNITIES TO FARM WITH  
THE NUMBER OF RURAL-FARM MALES ENTERING WORKING AGE  
BY ECONOMIC AREAS OF MISSOURI, 1970-75

Economic Area	Replacement Needs (number)	Youth Entering Age 20 (number)	Percent required to meet need
1 and A	228	1,896	12.02
2a	1,318	1,703	77.39
2b	1,538	1,796	85.63
3	761	1,580	48.16
4	122	940	12.97
5	197	1,006	19.58
6 and B	439	2,043	21.48
7	633	1,831	34.57
8	72	833	8.64
9a	266	971	27.39
9b	-349	1,979	0
Missouri	5,225	16,578	31.51

TABLE 36-COMPARISONS OF NUMBER OF FARMING OPPORTUNITIES WITH  
THE NUMBER OF 15-19 YEAR-OLD RURAL-FARM MALES EXPECTED  
TO LIVE UNTIL AGE 20 IN MISSOURI BY ECONOMIC AREAS, 1955-60

Economic Area	Number of Opportunities*	No. of 15-19 Year-olds to Live to Age 20	Percent required to meet need
1 and A	415	3,198	13.0
2a	1,891	3,079	61.4
2b	1,863	3,064	60.8
3	1,006	2,869	35.1
4	253	2,068	12.2
5	260	2,391	10.9
6 and B	531	3,351	15.8
7	604	4,243	14.2
8	132	2,071	6.4
9a	433	1,973	21.9
9b	881	3,745	23.5
Missouri	8,269	32,052	25.8

\*Opportunities expected between 1960 and 1965.

TABLE 37-COMPARISONS OF NUMBER OF FARMING OPPORTUNITIES WITH THE NUMBER OF 15-19 YEAR-OLD RURAL-FARM MALES EXPECTED TO LIVE UNTIL AGE 20 IN MISSOURI BY ECONOMIC AREAS, 1960-65

Economic Area	Number of Opportunities*	No. of 15-19 Year-olds to Live to Age 20	Percent required to meet need
1 and A	343	3,069	11.2
2a	1,451	3,046	47.6
2b	1,711	3,036	56.4
3	881	2,625	33.6
4	182	1,716	10.6
5	230	1,964	11.7
6 and B	494	3,223	15.3
7	556	3,573	15.6
8	98	1,725	5.7
9a	341	1,780	19.2
9b	331	3,518	9.4
Missouri	6,618	29,275	22.6

\*Opportunities expected between 1965 and 1970.

TABLE 38-COMPARISONS OF NUMBER OF FARMING OPPORTUNITIES WITH THE NUMBER OF 15-19 YEAR-OLD RURAL-FARM MALES EXPECTED TO LIVE UNTIL AGE 20 IN MISSOURI BY ECONOMIC AREAS, 1965-70

Economic Area	Number of Opportunities*	No. of 15-19 Year-olds to Live to Age 20	Percent required to meet need
1 and A	228	2,795	8.2
2a	1,318	2,586	51.0
2b	1,538	2,726	56.4
3	761	2,421	31.4
4	122	1,467	8.3
5	197	1,643	12.0
6 and B	439	3,050	14.4
7	633	3,018	21.0
8	72	1,320	5.5
9a	266	1,523	17.5
9b	-349	3,085	0
Missouri	5,225	25,634	20.4

\*Opportunities expected between 1970 and 1975.