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Factors Related To Levels of Living Of Oklahoma Farm Families

By

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The Story in Brief

The level of living of farm families throughout Oklahoma has risen markedly in recent years. The greatest improvement relatively, has been in eastern and southeastern Oklahoma—sections long characterized by low measures of material well being. In these areas, also, the basic economic pattern of agriculture has been changing much more rapidly than in other parts of the State. Thus Oklahoma at present offers an excellent opportunity to study the relationships between economic changes and changes in levels of living. Therefore such a study was undertaken by the Experiment Station, and this bulletin reports what was found.

The relationships studied are highly important both in the management of individual farms and in making of public policy on agriculture. In both management and policy making, we need to know whether a particular change (such, for instance, as farm mechanization, or a change in size of farm) can reasonably be expected to bring an enrichment of farm family living, which is the chief goal of all agricultural readjustments.

Some highlights of the information developed through this study include:

- Rising levels of living on Oklahoma farms have accompanied a shift from cultivated field crops to the pasturizing of livestock and other methods of reducing labor requirements in farming.
- Increase in the average size of farms has exerted a positive influence upon levels of living, but there is evidence that in some areas further enlargement of farm units might improve levels of living still further.
- Rising levels of living have resulted in a large measure from technological improvements, both mechanical and non-mechanical.
- Oklahoma's loss in farm population in recent years has exerted a buoyant effect upon levels of living, but there is evidence that in some areas further reduction of numbers of people on farms may be necessary before levels of living can rise to an optimum.
- The lessening dependence of farmers upon field crops requiring large inputs of labor has, apparently, lowered costs of production, thereby leaving larger dividends for family living.

- Levels of living on Oklahoma farms have been definitely improved by hiring outside labor and machines not furnished by the family.
- Levels of living of Oklahoma farmers rise directly as the level of education of the population 25 years of age and over rises.
- As levels of living rise, problems of old age and child dependency become less pressing, as a rule.
- Increases in the total farm investment do not always bring immediate improvement in levels of living because of the lag between the time when the investment is made and when it begins to add to family income.
- Farm families can fully satisfy their social needs only by finding the combination and proportions of land, labor, capital, and management which brings the greatest net difference between the outlay for production and the total returns.

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This study shows how certain features of agricultural organization relate to levels of living of Oklahoma farm families.** In general, farm-family levels of living have risen markedly during recent years, but the improvements made have been relatively greater in eastern and southern than in other areas of the State. That is to say that sections long characterized by low measures of material well-being have made of late the greatest strides toward expansion of their levels of living. It is true, also, that the agriculture of these same "low-level" areas has undergone a much more revolutionary reorganization recently than has characterized other parts of Oklahoma, often amounting to basic changes in farming patterns. Hence it is highly important, looking toward future farming policies, to find out when a particular change, such as from a small to a large unit, from the cultivation of crops to livestock farming, or from hand labor to mechanized production, may or may not be expected to bring an enrichment of family living, the chief goal of all agricultural readjustments.

SOME TRENDS IN OKLAHOMA AGRICULTURAL ORGANIZATION

When a given agricultural trend is somewhat regular, the inference is that its pattern of organization very nearly achieves its purpose. At any period the factors involved bear some kind of proportionate relationships, the one toward another. This facilitates looking into the future and planning for things to come. When a part of the agricultural system fluctuates in time in an erratic manner, it can make no contribution to understanding the problems at hand. In the fol-

* The author is grateful to Mrs. Marylee Mason Vandiver for drafting the maps used in this bulletin.

** Methods used in the study are discussed in the Appendix, page 19.

lowing tables one will find that some data justify conclusions and recommendations while others do not.

Land in Farms

Table I shows the physical quantities of land in Oklahoma by census years. While the total amount of land fluctuates little, caused mainly by changes in state boundaries and the impounding of water to form lakes, the land in farms has generally increased in proportion to the total. Yet, as an association of the several census dates with national history will reveal, the proportion of land in farms has varied appreciably with the demands of a growing population up to 1910, and with wars and depressions since 1910. It appears that by 1945 Oklahoma began to reach the limit on the new land reserve capable of being brought into farms. That is to say, further adjustments in farm land must be made with that already available, by and large.

Use of Farm Land

A land-use table, especially for a whole state, is only an approximation to the true picture. Hence small differences between land classifications can be explained usually by error. However, Table II shows decisively that crops are of declining significance in reference to the proportions of farm land planted to them in Oklahoma. It is clear also that various kinds of pasture together are taking up increasing proportions of Oklahoma farm land. Other data show that

LAND IN FARMS

Table I.—Approximate Total Land Area, Land in Farms, Per Cent of Land in Farms, and Per Cent of Change in Land in Farms in Oklahoma; by Census Years.

Census Year	Millions of Acres, Total Land Area	Millions of Acres in Farms	Percent of Total Land in Farms*	Percent of Change, Land in Farms*
1950	44.2	36.0	81.5	— .4
1945	44.3	36.2	81.6	2.3
1940	44.3	34.8	78.5	— 1.5
1935	44.4	35.3	79.6	4.6
1930	44.4	33.8	76.1	10.6
1925	44.4	30.5	68.8	— 4.4
1920	44.4	32.0	71.9	10.7
1910	44.4	28.9	65.0	25.5
1900	44.4	23.0	51.7	---

*Percentages computed from unrounded figures.

Sources: For census years 1920-1950, inclusive. *United States Census of Agriculture, Oklahoma,* Vol. I, Pt. 25, 1950, p. 3; for 1900 and 1910, *Fifteenth Census of the United States, Agriculture, Oklahoma, First Series,* 1930, p. 6.

major crops which can be produced by use of machines have maintained their relative importance while those which require hand labor have declined. This applies to acreages only. It means that farmers are moving generally toward production methods which give promise of economies in the uses of land and labor.

General Trends

Table III shows that while operators of farms are becoming well-nigh universal, that farm tenancy is declining rapidly, that the average size of farms is increasing, that the average value of farm land per acre is rising, and that tractor farming, a symbol of mechanization in general, is increasing in large proportions. This means, undoubtedly, that farming in Oklahoma is becoming highly selective, demanding operators who are able to acquire and manage larger land and capital units.

USE OF FARM LAND

Table II.—Distribution of Oklahoma Land in Farms for Different Census Years According to Use of Land.

Uses of Land	Percent of Land in Given Use at Census Year:					
	1950	1945	1940	1935	1930	1925
All uses	100.0	100.0	100.0	100.0	100.0	100.0
Cropland harvested	33.0	39.0	36.7	34.9	46.0	47.1
Cropland pastured	6.4	4.9	11.0	7.3	9.6	12.6
Cropland idle	5.0	3.0	8.8	13.3	5.3	4.2
Woodland pastured	13.9	11.4	7.4*	12.1	10.6	9.6
Woodland not pastured	2.5	1.1	1.4*	1.6	1.5	1.5
Other pasture	35.5	36.9	30.5*	26.3	23.1	20.0
Waste land, roads, bldgs.	3.7	3.7	4.2	4.5	3.9	5.0

*Estimated by interpolation, actual figures not being available in forms comparable to those of other census years.

Sources: For 1950, 1945, 1935, 1930, and 1925, *United States Census of Agriculture, Oklahoma,* Vol. 1, Pt. 25, 1950, p. 3. For 1940, *United States Census of Agriculture, Oklahoma,* Vol. I, Pt. 5, 1940, p. 224.

Table III.—General Trends in Oklahoma Agriculture; by Census Years.

Census year	Percent of white farm operators	Percent of farm tenancy	Acre value of land and buildings	Average size of farm acres	Percent of farms with tractors
1950	93.7	31.4	$51	253.1	50.4
1945	93.2	39.9	31	219.4	37.0
1940	92.4	54.4	24	193.7	22.9
1935	91.6	61.2	22	165.6	---
1930	88.7	61.5	37	165.8	11.4
1925	89.8	58.6	34	156.5	5.0
1920	90.2	51.0	43	166.4	3.0
1910	89.1	54.8	25	151.7	---

Source: *United States Census of Agriculture, Oklahoma,* Vol. 1, Pt. 25, 1950, pp. 4-5.

HIRED LABOR

Table IV.—Hired Labor on Oklahoma Farms; by Census Years.

Census year	Percent of farms with hired labor	Percent of hired laborers in total farm workers
1950	9.6	8.9
1945	2.3	4.3
1940	10.3	10.8
1935	10.1	8.3

SIZE OF FARMS

Table V.—Distribution of Oklahoma Farms According to Size in Acres; by Census Years.

Census year	Percent of Farms*				
	Under 10 acres	10 to 99 acres	100 to 259 acres	260 to 499 acres	500 acres & over
1950	5.0	31.3	36.8	17.4	9.5
1945	9.2	32.1	36.5	15.0	7.2
1940	4.8	37.7	39.3	12.7	5.5
1935	3.7	43.6	39.2	9.9	3.6
1930	2.6	43.3	40.3	10.2	3.6
1925	1.8	45.1	40.6	9.8	2.7
1920	1.1	41.6	43.0	11.1	3.2
1910	1.1	39.7	48.0	9.3	1.9

*Figures total 100 percent horizontally for each year.
Sources: *United States Census of Agriculture, Oklahoma,* Vol. I, Pt. 25, 1950, p. 3; *United States Census of Agriculture,* Vol. 1, Pt. 5, *Oklahoma,* 1940, p. 213.

POPULATION PER WORKER

Table VI.—Population Changes and Labor Force Trends in Oklahoma, 1900-1950.

Census year*	Total population	Total Population Per Worker in:		
		Total labor force	Non-Agricultural labor force	Agricultural labor force
1950	2,233,351	2.8	3.6	12.5
1940	2,336,434	2.9	4.1	10.0
1930	2,396,140	2.9	4.6	7.8
1920	2,028,283	3.0	5.4	6.6
1910	1,657,155	2.8	6.2	5.0
1900	790,391	3.0	9.9	4.2

*Figures for 1940 and 1950 are not strictly comparable to those of previous census years. Even if they were, the trends would remain the same in general.
Sources: *Census of the United States, Population,* 1950, P-B 36, pp. 30, 40, 46.
Otis Durant Duncan, *Recent Population Trends in Oklahoma.* Stillwater, Okla. AES Bulletin No. B-269, 1943, pp. 14-15.

In time, it is expected that the results of these movements will be reflected in higher levels of living for farm families.

Use of Hired Labor

Table IV indicates, except for the war year 1945, that hired labor on farms is relatively stable. Most probably, the use of machines, as happened during World War II, may enable farmers to minimize the hiring of labor. Data given later in the study will show that such an economy contributes to improved family living.

Size of Farms

The significance of Table V is in showing that farms below 10 acres and above 260 acres in size are of increasing relative importance in Oklahoma. This is an evidence of growing specialization and commercialization on practically all the larger farms. For the small farms, it means that (1) intensified suburban and (2) part-time farming are on the increase. In general, these trends mean that farms of intermediate size are at the point of beginning to fail to provide adequately for the families on them. Otherwise, they would gain rather than lose ground numerically.

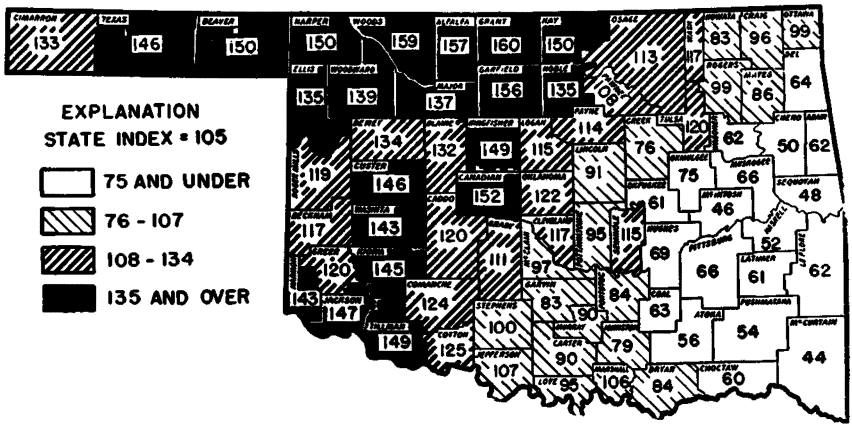
Population Per Worker

Table VI shows that while the number of people supported per worker remains almost constant, there is a keen competition for employment in the nonagricultural labor force. On the other hand, the farm worker has a large and growing population depending on him. He contributes to the maintenance of 12.5 persons per worker while the non-farm laborer contributes to that of only 3.6 persons. This spread has been in the making for a long time, and bids fair to becoming even greater in the future, which can give the farmer only an optimistic outlook for improving his lot, barring calamities.

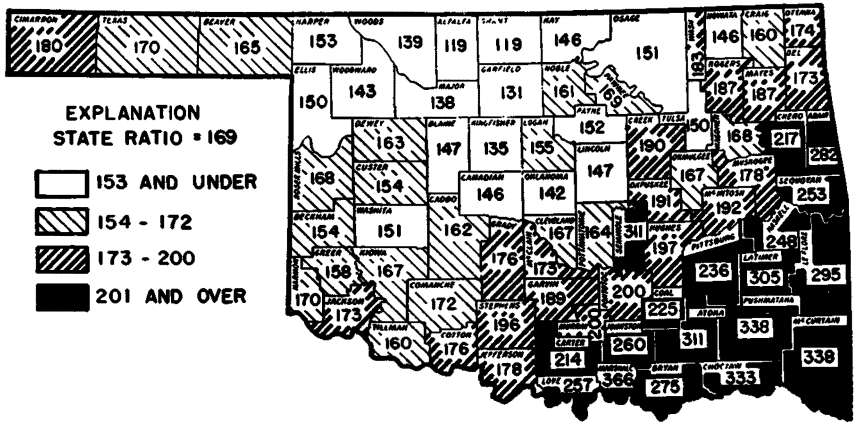
COUNTY DATA

An index of levels of living of farm families shown on a map of Oklahoma by counties serves as the beginning of a series of comparisons with other data similarly mapped. To see the full significance of these maps, it is necessary to carry along a mental picture of the base map while examining those which follow it. It is necessary to bear in mind, too, that the relative value of a figure may be far different from its absolute value. Usually, the light and the shaded areas on the maps are reversed when the data are expressed in

relative in place of in absolute values, or in ratios rather than in actual count. Remembering these explanations will facilitate interpretations of the maps.

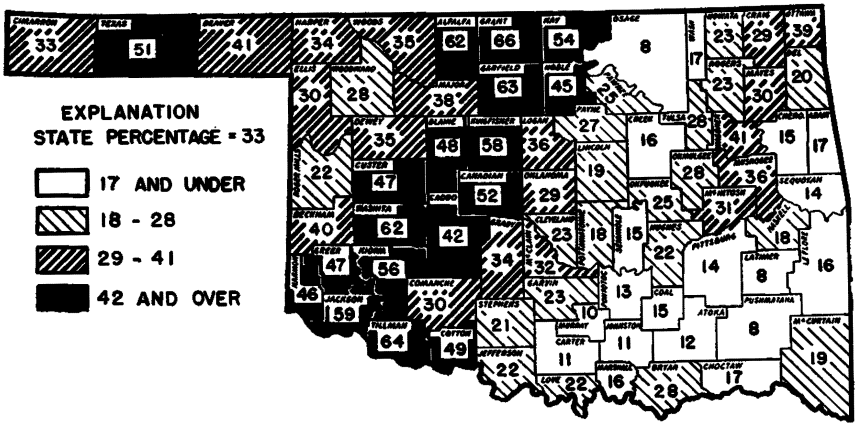


Map 1.—Level of Living Index for Oklahoma Farm Families. The map shows clearly how the index falls into large clusters of counties.



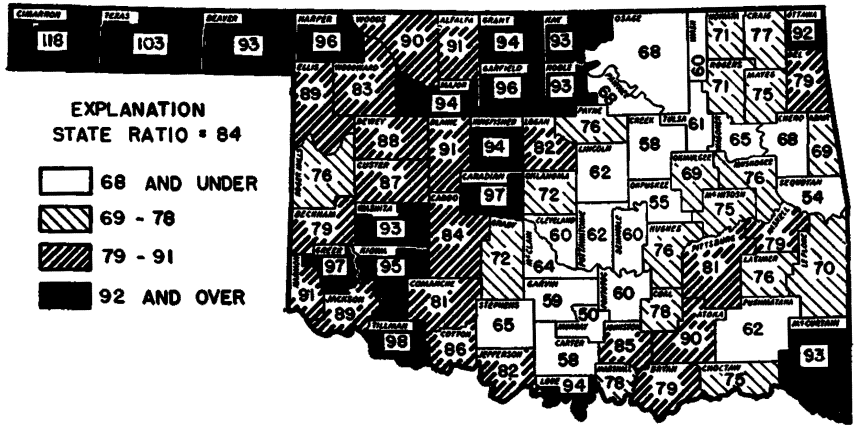
Map 2.—Change in Level of Living Index, 1940 to 1950 (1940=100).

The low-index counties had the greatest improvement, relatively, during the decade, while the high-index counties had the least. Even so, the low-index areas still have many unsolved problems.



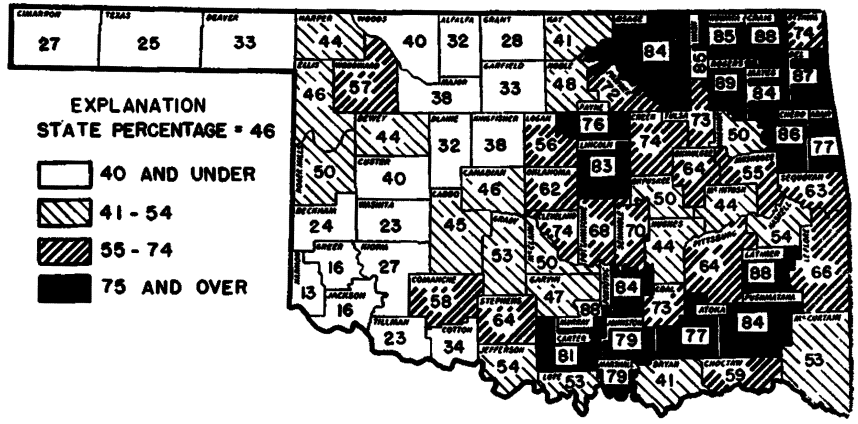
Map 3.—Ratio of Land in Harvested Crops to Total Land in Farms, 1950.

The proportions of farm land in harvested crops are greatest in the wheat-growing counties, or where wheat is a strong competitor with other crops. Usually, levels of living are low where crops take up small proportions of farm land. However, these areas are initiating changes which, in the long run, will raise their levels of living.



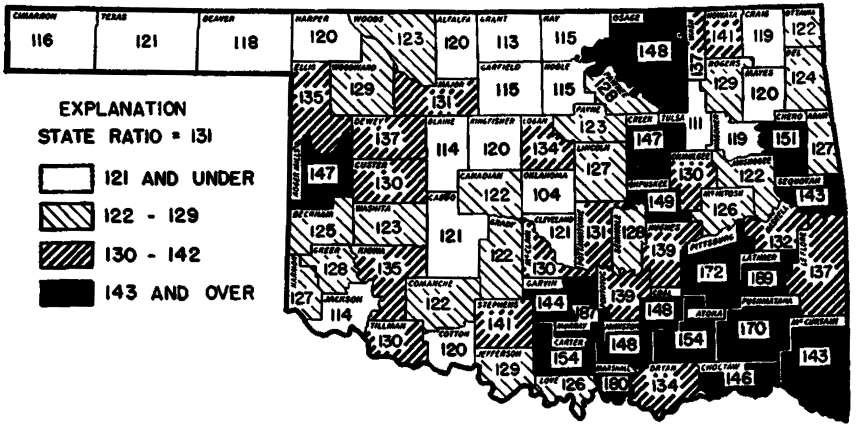
Map 4.—Change in Land in Harvested Crops, 1945 to 1950 (1945=100).

The low-index areas, for the most part, show a marked gain, and this doubtless aids in explaining the distribution shown on Map 2. Usually, the greatest gains have been made where the need for improvemnt was the greatest.



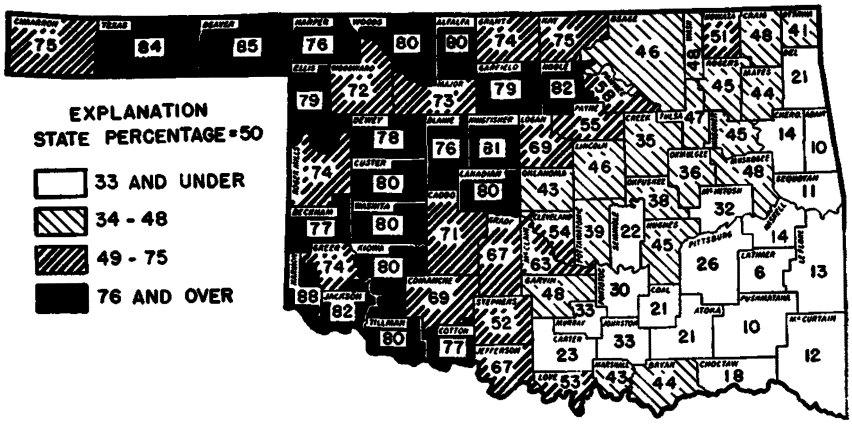
Map 5.—Percent of Total Farm Income Derived from Livestock and Livestock Products, 1949.

The relative importance of livestock as a source of farm income is generally at its greatest in the low-index areas. That may have contributed appreciably to the marked improvements made in those areas during recent years.



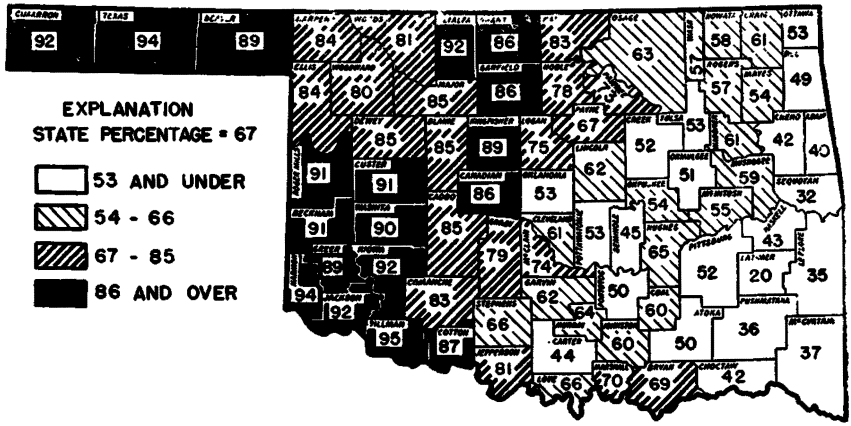
Map 6.—Change in Average Size of Farms, 1940 to 1950 (1940=100).

The greatest relative increase in average size of farms has occurred in the low-index areas. In most of these sections a long recognized problem has been undersized farms. It is evident that the problem has reached a partial solution, although further enlargement of farms may be necessary.



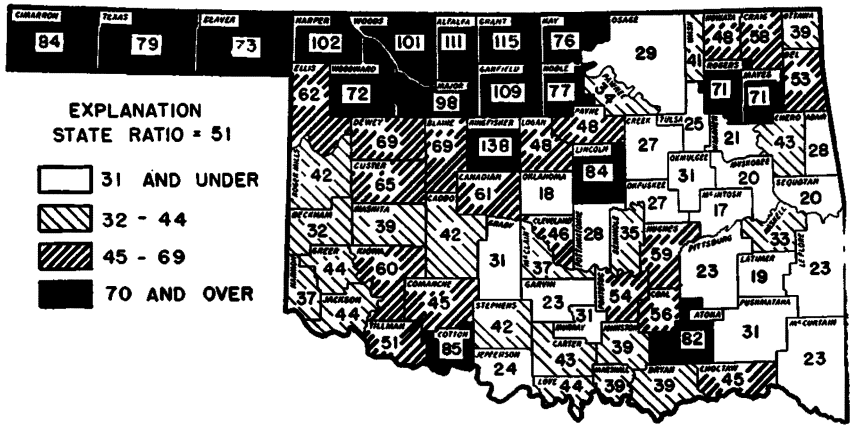
Map 7.—Percent of Farms with Tractors, 1950.

Comparison of this map with Map 1 shows a high coincidence of farms with tractors and higher level of living indexes. It is not the presence of tractors alone which is responsible. Type of farming and other factors are contributive. Most of the low-index counties have several times as many tractors per 1000 acres of crops as do the high-index counties. Agriculture must lend itself to the tractor before the tractor can help improve levels of living.



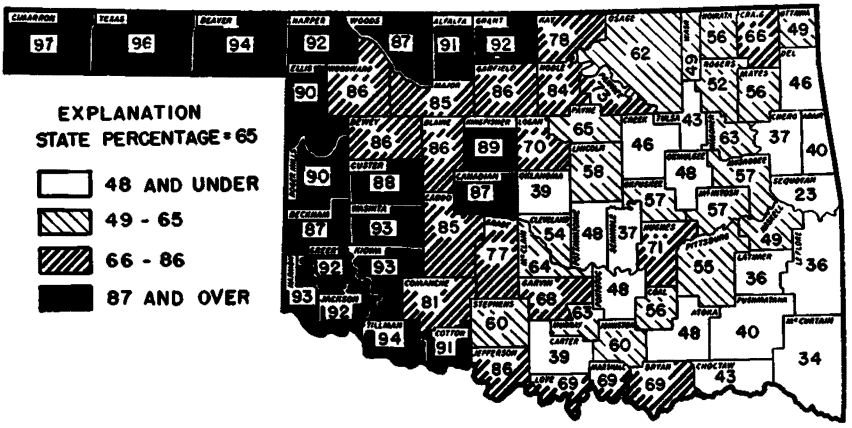
Map 8.—Percent of Farm Operators Hiring Labor and/or Machines During Crop Year, 1949.

Areas where farmers hire machines and labor on the largest scale are also marked by higher levels of living. Of course, this means that in such areas there are few such things as family subsistance farms, and making a living is only an incidental part of farming.



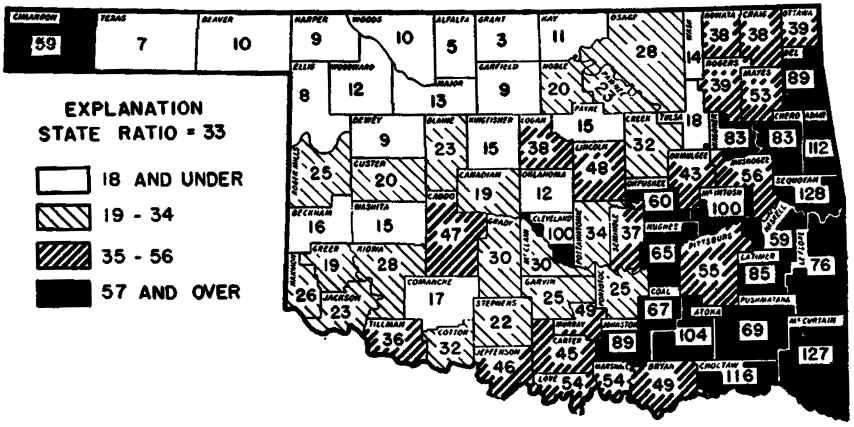
Map 9.—Ratio of Machine Hire to Wages Paid for Farm Labor During Crop Year, 1949.

This map indicates strongly the superiority of machines over labor as far as contributions to family living are concerned. It is in the very highest-index counties where there is the greatest excess of machine rent over wages to labor, which is to stress commercial farming.



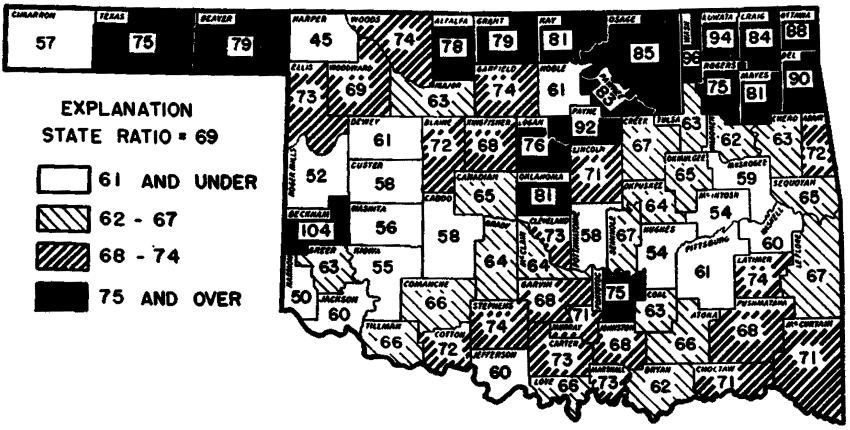
Map 10.—Percent of Farms Classed as Commercial, 1950.

The close similarity of this map to Map 1, and its likeness to Maps 3 and 7, show the definite positive correlation between levels of living and commercialization of farming.



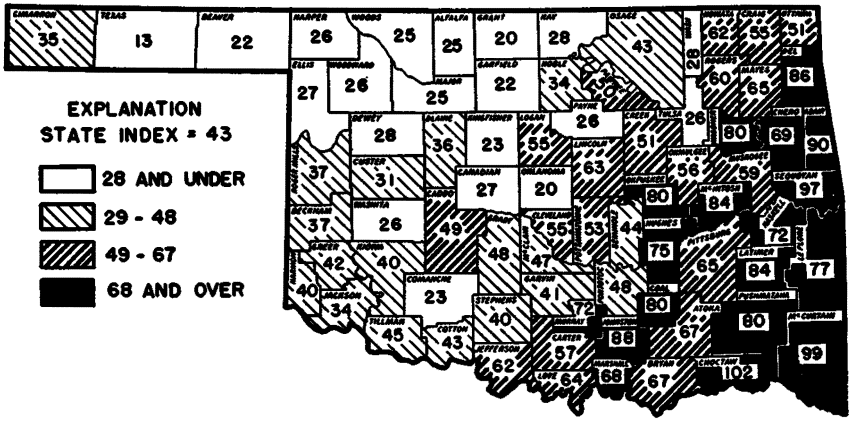
Map 11.—Dependent Children per 1,000 Population, 1950.

This map is practically the inverse of the levels of living map (Map 1), as is to be expected. The exceptions are counties with boarding homes, orphanages or other institutions.



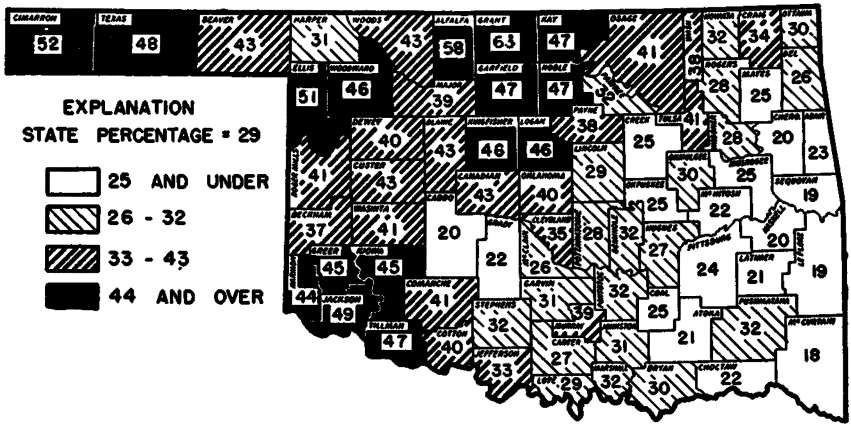
Map 12.—Number of Persons 65 Years of Age and Over per 1,000 Rural-Farm Population, 1950.

The geographical distribution of old people in the farm populations reverses expectations. Old age as such does not have a close bearing directly upon levels of living.



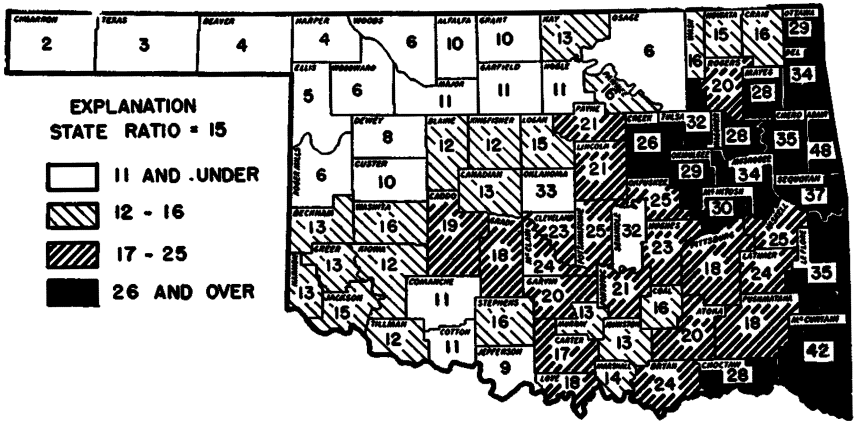
Map 13.—Index of Dependency, 1950.

When dependent children are included along with dependent aged persons in an "index of dependency," the map becomes almost the direct opposite of Map 1, which strengthens the value of the index of levels of living as a measure of social and economic status.



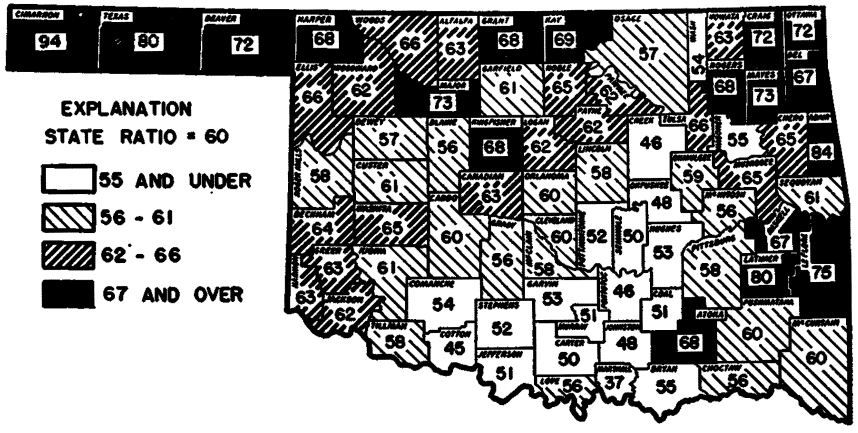
Map 14.—Percent of Farm Population 25 Years of Age and Over With Education Beyond Eighth Grade, 1950.

With some exceptions not readily explainable, this map corresponds in the main with Map 1. This means, as a rule, that where farmers have more than average education the probability is high that they can maintain high levels of living.



Map 15.—Farm Population per 1,000 Acres in Farms, 1950.

This is an absolute number rather than a percentage, and the map shading reverses, meaning that there is an inverse correlation between population density and levels of living. Perhaps half the counties of Oklahoma have some population pressure, despite losses of recent years. In at least one fifth of the counties, population pressure on the land appears to be serious.



Map 16.—Farm Population Change, 1940 to 1950 (1900=100).

All counties lost farm population, but the losses were not highly consistent with changes in levels of living (See Map 2). Population diminution was not synchronized with changes in levels of living, which means that farm population size explains little until it is expressed as a density measure.

CONCLUSION

The levels of living maintained by a farm population must be determined by the agricultural system, at least in a large measure, since it is by farming that the people produce whatever they use. Yet this relationship is not always immediate and direct. Nor does it remain the same from one geographic area to another. It may take several times as much land, several times as much labor, or several times as much capital investment in one area as in another to produce the same dollar value in consumer goods. Even then, the level of living will vary somewhat according to the population on the land, the degree of isolation, and the nature of products grown. Rates of "turn-over" in farm operations vary according to commodity and the means of production necessary. That is why geographical factors and type of farming are highly important in determining levels of living.

This study raises two crucial problems of relationship between levels of living and agricultural organization. The *first* is that there is an inevitable lag, sometimes of months and again of years, between a particular change in agriculture and its reflection in levels of living. In other words, a farmer may double the size of his farm without affecting the need of his family for consumer goods. In fact, doubling the size of a farm may not increase the ability of the family to purchase consumer goods until several years have passed, because this will be an increase in total fixed charges. It takes time for a new investment to "pay off." *Second,* looking at the State as a whole one can see that to set in motion all the adjustments necessary to improve levels of living for the whole farm population there are many factors to take into account. Climate, land fertility, distances to markets, and numerous other considerations are likely to create inertia and friction which will impede improvements in family living.

Besides technological and natural factors, then, to set the stage for general improvement in levels of living requires the elimination of many obstinate social impediments. The cultural facilities supplementary to agricultural are practically as important to family living as ability or produce commodities. Transportation facilities, markets, the existence of utilities, the general economic condition of the nation, and social institutions available to farmers must be considered as elements of well-being. Hence, to improve farm-family levels of living, it is as necessary to build a rich cultural and social environment as to restore land to a state of high fertility.

APPENDIX

Note on Methods Used in the Study

This study employs the Hagood Index of farm-family levels of living as a research tool.* This index is used as the dependent variable, while other characteristics of Oklahoma agriculture, as shown in the United States Census of Agriculture are taken as independent variables.

In addition, an index of Dependency is employed as an independent variable. This index is constructed from the case loads on old age and child dependency for the fiscal year ending June 30, 1950. It is taken from the annual report of the Oklahoma Department of Public Welfare, 1950. The factors are weighted arithmetically, giving the following formula:

Index of Dependency 1950=.5951X_1+.4049X_2.

In this formula X_1 represents the number of recipients of old age benefits per 1000 population, while X_2 is the number of dependent children per 1000 population, per county, during the fiscal year July, 1949 to June 30, 1950, inclusive.

For convenience in statistical manipulation the census characteristics are reduced either to percentages or to ratios. They are related to the Hagood Index by simple Pearsonian methods. The correlation analyses are not shown in this study, but will constitute the basis of a companion study now in preparation.

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* See Margaret Jarman Hagood, "Farm-Operator Family Level of Living Indexes for Counties of the United States, 1930, 1940, 1945, and 1950," Washington: Bureau of Agricultural Economics, USDA, May 1952 (Mimeographed), pp. 40, 77. This Index is constructed as the sum of four elements weighted by factor analysis. These are (1) percentage of farms with electricity in dwelling, (2) percentage of farms with telephones in dwelling, (3) percentage of farms with automobiles, and (4) mean value of farm products sold or traded per farm reporting, in hundreds of dollars. She derived the following formula:

Index 1950 = $.538X_1 + .603X_2 + .617X_3 + .319X_4$.

For 1930, 1940, and 1945, she constructed indexes by the same methods, but obtained slightly different weights for the several factors.