

SOME ASPECTS OF LAND UTILIZATION AMONG DIFFERENT OWNERSHIP
GROUPS IN OSAGE COUNTY, OKLAHOMA

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GROUPS IN OSAGE COUNTY, OKLAHOMA

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PREFACE

The subject matter of this thesis deals with land use and soil conservation practices among Indian and non-Indian farm operators and is not concerned with the huge oil fortunes built up to the credit of the Osages except as it affects land utilization. Since the bonuses for oil leases and royalties from oil developments have declined materially in recent years, and no doubt, will continue to decline in the decades to come, the Osage Indians, like many white people of Osage County today, will come to rely more and more upon agricultural undertakings. This situation leads us to inquire into the present land use and soil conservation practices of the Osages with a view of projecting the developments and tendencies into the future.

The original data for this study were gathered through the use of a questionnaire (see Appendix A), and by the personal interview and inspection method. The study embraces 115 operating units which are divided into groups as follows: 40 restricted Indian farmers, 37 unrestricted Indian farmers, and 38 white farmers. The area included in the study comprises the central and southwestern part of Osage County, Oklahoma. (See map, Appendix A).

This thesis treats that portion of the historical development of the Osage Reservation which has an influence on land use and the social and economic factors which have shaped the present agricultural economy of the area. Possibilities of readjustments to effect a more economic use of the land with emphasis on soil conservation are discussed in some detail. The important factors affecting land use and soil conservation practices are treated comparatively among the restricted Indians, unrestricted Indians

and white farm operators, as well as by classes of tenure. The recommendations, based on this study, are made with a view of preventing waste and destruction of the soil, reapportionment of factors of production to bring about a more economic use of the land and further development of other means of production to the ultimate benefit of the operators and society.

This study was made possible by the cooperation and courtesy of Mr. C. L. Ellis, Superintendent of the Osage Indian Agency, Pawhuska, Oklahoma, and Mr. J. P. Lawyer, Appraiser and Acting in Charge of the Osage Indian Extension Service of the Agency. I wish to acknowledge also the assistance rendered by the Agency's Farm Agents, Mr. M. A. Derdeyn, Mr. E. W. Mitchell, and Mr. G. C. Thompson of the Pawhuska, Hominy, and Fairfax districts respectively, and the Historian and Curator of the Osage Museum, Miss Lillian B. Mathews.

Above all I wish to acknowledge the willing assistance and helpful suggestions of Mr. Randall T. Klemme, Assistant Professor of Agricultural Economics and Dr. Peter Nelson, Acting Head of the Department of Agricultural Economics, Oklahoma Agricultural and Mechanical College.

July 12, 1939

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CHAPTER I

THE HISTORICAL BACKGROUND AFFECTING LAND USE IN OSAGE COUNTY, OKLAHOMA

To understand the present situation with respect to land use among the Osage Indians, a historical perspective of land use development should disclose some of the factors responsible for conditions as they are now found. The Indian's personal characteristics, his traditions, the capital available to him, the kind of land he occupies, and his ownership in the land are among these factors.

Originally the Osage Indians claimed, hunted over, and successfully defended all the territory north of the Arkansas River and west of the Mississippi that lies within the Louisiana Purchase area. They lived by hunting and fishing and made but slight efforts at agriculture. As the Osages ceded and sold more and more of their former range and as they thereby became confined to smaller and smaller areas, which did not provide sufficient hunting grounds, agricultural undertakings became more necessary. They finally gave up their nomadic mode of existence and were settled in the Osage Reservation, now Osage County, Oklahoma. At first the efforts made by the government agents to induce them to become agriculturists had but little general effect. The Osages would not work and preferred to live in villages and towns rather than on farms and ranches. ^{1/} There are 233 farms operated by restricted Indians at the present time in Osage County. (See Table 2, page 16). The Census rolls of the Osage Agency as of January 1, 1938 show 3,672 Osages of all degrees of blood. ^{2/}

1/ Ernest F. Gorton, "Education Among the Osage Indians," unpublished thesis, Oklahoma Agricultural and Mechanical College, 1935, pp. 11-12.

2/ The Annual Report of Extension Workers of December 31, 1938, Osage Indian Reservation, Pawhuska, Oklahoma.

The area reserved for the Osage Indians is comprised of approximately 1,475,000 acres most of which is rolling and very hilly grassland.

However, some of the land lies in creek and river bottoms and is adaptable to many crops but more especially to grain crops.^{3/} This combination of grasslands and grain croplands makes the area suitable for livestock production.

From the time of the removal of the Osages from Kansas to the Oklahoma Reservation, which was about 1872 until 1906, the tribe owned the land as a tribe and not as individuals. The Allotment Act of 1906 provided for the division of the land among the then existing 2,229 members of the tribe in equal shares. The government retained a considerable degree of control over the individuals and over their use and disposal of their land. The acreage allotted to each and the method of division had a direct bearing on subsequent land use. A portion of the Allotment Act of 1906 providing for the division of the land is quoted below:

"An Act for the Division of the Lands and Funds of the Osage Indians in Oklahoma Territory, and for other purposes. ^{4/}

"Section 2. That all lands belonging to the Osage tribe of Indians in Oklahoma Territory, except as herein provided, shall be divided among the members of said tribe, giving to each his or her fair share thereof in acres, as follows;

"First. Each member of said tribe, as shown by the roll of membership made up as herein provided, shall be permitted to select one hundred and sixty acres of land as a first selection.....

"Third. After each member has selected his or her first selection as herein provided, he or she shall be permitted to make a second selection of one hundred and sixty acres of land in the manner herein provided for the first selection."

^{3/} The Daily Journal-Capital, Pawhuska, Oklahoma, Volume XXI, No. 92, p. 4, Sunday, April 24, 1938.

^{4/} United States Statutes at Large, 59th Congress 1905-1907, Volume 34, Part I, Public Laws, pp. 539-545.

A third selection was likewise provided and each member permitted to designate which of his three selections should be a homestead,

"and his certificate of allotment and deed shall designate the same as a homestead, and the same shall be inalienable and non-taxable until otherwise provided by Act of Congress. The other two selections of each member, together with his share of the remaining land allotted to the member, shall be known as surplus land, and shall be inalienable for twenty-five years, except as hereinafter provided." 5/

It was provided by this Act that the remaining lands, after the first, second, and third choices, were to be divided as equally as practicable among members under supervision of a commission to be appointed. 6/

From the above it will be noticed that the individual members of the tribe were allotted their holdings in series, which fact largely precluded the possibility of the individuals owning contiguous holdings. This arrangement was, no doubt, satisfactory from an equitable point of view, as it tended to partition the best grade of land equally among the members before the poor lands were divided. From a land utilization point of view, the distribution in scattered tracts for the individual owners was not a satisfactory arrangement; especially is this true when we consider the soil and topographical features of the Reservation. This area lends itself admirably to livestock production and the acreage allotted each individual would have made an excellent operating unit had it been contiguous.

The Allotment Act of 1906 provided further that the Secretary of the Interior at his discretion and at the request of any adult member of the tribe might issue such member a certificate of

5/ Ibid.

6/ Ibid.

competency. Such certificates when issued, removed from the individual Indians the restrictions upon the use and disposal of their lands with the exception of the homesteads. Recalling that the individual holdings were in scattered tracts and that the so-called certificated Indian could dispose of his land, it was to be expected that he would dispose of some of his land as soon as a suitable opportunity presented itself.

The Allotment Act of 1906 provided that a final roll of membership in the tribe should be made up of all Osages in the tribe and all others born before July 1, 1907. This final roll contained 2,229 names. They held approximately one section of land each in 1907.

All mineral rights were reserved to the tribe. All land owned by restricted Indians could be leased for agricultural purposes only upon approval of the Secretary of the Interior. The reserving of the mineral rights to the tribe proved to be a matter of great consequence as the Reservation was found to cover one of the largest oil fields in the State of Oklahoma. Oil developments began in the County before the Allotment Act was passed and continued with increasing importance until about 1929. In the year 1925 alone, every individual of the Osage Nation with an originally assigned or an inherited right in the Nation's land drew \$13,000 from the oil which had never been thought of when the tribe was assigned to the area.^{7/}

This wealth from oil, being diffused throughout the members of the tribe largely, became an important factor influencing land utilization. Some of this wealth, through the control and efforts of the government, has been directed into the construction of rural homes and into conserving and improving the soil. Also, the wealth

^{7/} C. B. Glascock, Then Came Oil, pp. 147-148.

accumulated and the present income from oil renders the widespread planting of cash crops less necessary and at the same time provides the Indians with sufficient capital to permit them to follow a large scale conservation program where needed. More especially is this true among the restricted Indians. The availability of capital also places the Indians in a position to acquire the necessary machinery and livestock for their operating units.

From this discussion it will be seen that the Osage Indians of a century ago had no use for land except a small area as a home for the tribe and a wide area over which to hunt and fish. They had an aversion to work which had to be overcome before any progress in agriculture could be made. As their lands were ceded and sold and the tribe became confined to smaller areas, agricultural pursuits became necessary. Agricultural use of the land led to the abandonment of the tribal ownership of the Reservation and resulted in the partition of the land among the individual members of the tribe. As the members of the tribe increased and their land holdings decreased, or in other words, as more white people moved into the Reservation, more intensive agricultural practices gradually resulted.

Since provisions were made by law for the issuance of certificates of competency to capable Indians under specified circumstances, some of the individuals acquired legal right to dispose of and to use their land at their discretion. This privilege coupled with the fact that each individual owned land in scattered tracts, rendered it possible and in many cases, no doubt, desirable for them to dispose of parts of their holdings.

As the income from lease bonuses and royalties from oil production become less and less as it has and will, agricultural pursuits become

more pronounced and greater in importance. This thesis will treat the problem of the present land utilization in Osage County and its relationship to the future of the Osage Indians.

CHAPTER II

GATHERING AND TESTING DATA FOR THE STUDY

Sufficient information concerning land use and soil conservation practices among the different ownership groups in Osage County was not available from sources other than the individuals to be studied. Some phases of the study required personal interviews with the operators and inspections of the units operated. A questionnaire was therefore used and the personal interview and inspection method of gathering data was followed. The data gathered and tabulated have been compared with the data of the Federal Farm Census for the area with a view of determining how well the two sets of data compare and to what extent the data of the survey represent the area and groups under consideration.

Method of Gathering Data

The data for this study was gathered by the use of a questionnaire, a copy of which will be found in Appendix A. In Figure 11, also Appendix A, the locations of the units studied by classifications, that is, restricted Indian farmers, unrestricted Indian farmers, and white farmers, are given.

+ The field survey was conducted entirely by the writer between the dates of March 1, and March 20, 1939, and provides the source of all original data used in this study. All restricted Indians studied and many unrestricted Indians were interviewed in the presence of and in cooperation with the Government Farm Agents, Mr. Mitchell, Mr. Thompson, and Mr. Derdeyn of the Hominy, Fairfax, and Pawhuska areas, respectively. These agents, being well known to the Indians, afforded an excellent approach and resulted in the obtaining of more detailed and, no doubt, more accurate information than could have been gotten otherwise.

Parts of the questionnaire call for estimates of values and degrees of erosion, classifications of homes and improvements by conditions of upkeep, and other matters requiring observation, inspection, and the exercise of judgment. All these observations were made by careful inspection and recorded on the questionnaire immediately. In arriving at the value of the land in each unit studied, consideration was given to the topography of the unit, the proportion in cultivation, the condition of the grassland, amount of erosion, and the yields as reported for the past few years. Recent sales values where available were given consideration. The evaluations were based entirely upon the worth of the land for agricultural purposes.

All restricted Indian operators within the area studied were included in the field survey; in fact this group determined the study area in a measure as the area was extended until a desired number of restricted Indian operators were included. The other groups, unrestricted Indians and white farmers, were then selected at random within the area.

Comparing the Data Gathered in the Field Survey with That
of the 1935 Federal Farm Census

Table 14, in Appendix C, gives the figures, and affords basis for computation of percentages taken from the Federal Farm Census of 1935. The townships of Big Hill, Fairfax, Hominy, and Strike Axe, considered in this table not only cover the area included in the field survey, but cover considerable area not included in the survey. The political subdivisions or political townships of the Census do not coincide with the legal townships of this study, which fact made it impossible to compare coextensive areas. The totals of the figures from the Census of the four townships, the averages and percentages of the items being compared, and the County totals and percentages are included. Also, on the lower

part of the table are given comparable data from the field survey. These data include averages and percentages computed from all groups studied combined, and also the same data computed from the information obtained from the white farmers only.

There are certain limitations in this comparison that must be given due consideration. The areas being compared are not coextensive. The Census data gave the number of farms and that figure was used as a basis in computing averages, whereas the field survey dealt with the operating units as well as with the farms. The farms are in many cases smaller than the operating units of the study. This condition tends to make the averages for the Census data smaller than that of the field survey. In the matter of land ownership, for example, the percentages between the two sets of data vary considerably, but in the field survey undue credence is given to the restricted Indian group. In other words, the restricted Indian group, which is the predominant owner-operator group, comprises approximately one-third of the sample in the survey, whereas in the Census data this group comprises but a very small percentage of the total for the area. Not the entire area, but only a random sample of those units falling within the general area were considered in the field survey.

The data from the Census were tabulated as of January 1, 1935; that of the field survey as of March, 1939. The crops grown taken from the Census were for the year 1934 and included only acreages of crops harvested; those of the survey were of the year 1938 and included acreages planted. The Census data included chickens only if over three months old; the survey included all chickens.

The average acreage per farm in the area under consideration was found to be 419 from the Census data as compared to 461 from the field

survey data. The percentage of land in crops from the Census data of 1934 was 15.8 percent as compared to 27.0 percent for 1938 from the survey. The variation between the two sets of data was not so great in the percentage of land in pastures; it being 81.9 percent from the Census data and 73.0 percent from the survey data. All land not in crops was tabulated as pasture land in the survey.

There appears a wide variation in the item of the percentage of rented land. (See Table 14A, page 11). The Census data for the area under consideration show 68.7 percent rented land as compared to 41.4 percent shown by the field survey. However, when only the white operators from the field survey are considered, the variation narrows to about 2.0 percent, being 66.3 in the survey and 68.7 in the Census data. The better comparison of data is afforded in the latter instance as by far the greater number of operators included in the Census data are white.

The average value per acre of land was found to be \$15.00 for the area from the Census data, and \$14.00 for the County as a whole. The average taken from the estimates of the field survey revealed an average value of \$18.00 among all groups studied and \$17.00 among the white operators only.

A summary of Table 14 in Appendix C showing some of the more important comparisons and contrasts between the two sets of data are given below. This summary Table (Table 14A) includes the averages and percentages of the four townships and the County from the Census data and the averages and percentages from the entire field survey and those from the white operators of the field survey only.

Table 14A. Averages and Percentages of Federal Farm
Census Data 1935 as Compared to Those of the
Field Survey March, 1939

	:Percent:	Average	:Percent:	Percent:	Average:	Percent:	Percent
	:Owners	: Value	: Acres	: Acres	: Acres	: in	: Land
	:	: Per	: in	: in	: Per	: Crop-	: Rented
	:	: Acre	: Wheat	: Oats	: Farm	: land	:
Area Total (Census)	25.2	13	.71	1.8	419	15.8	68.7
County Total (Census)	25.7	14	.81	1.6	441	14.6	61.4
Field Survey (All)	62.6	18	10.40	5.5	461	27.0	41.4
Field Survey (Whites only)	28.9	17	10.70	5.0	319	31.3	66.3

Source: See Table 14, Appendix C.

The widest variation between the two sets of data appeared in the comparison of the principal crops. In the percentages of acreage in wheat from the Census data for the year 1934, the figure was found to be .71 for the area. From the field survey for the year 1938, the percentage in wheat was 10.4. The percentage of the area in cropland was also higher from the survey as mentioned above. In making the survey, the writer interviewed each operator along the road as opportunity permitted. This method precluded the possibility of including large absentee land owners who lease their holdings for grazing purposes primarily. Other crops did not show so wide a variation in the data. The field survey data showed an average of 6.5 horses and mules as compared to 4.4 for the area from the Census data. There is but very little variation between the two sets of data of the average number of cattle per farm. The Census figure showed 44.9 for the area and 40.8 for the

County as of January 1, 1935 as compared to 38.2 from the field survey as of March, 1939.

In most instances, the data of the white operators only, taken from the survey, compared much more favorably to the Census data than did the data from all groups in the survey. This observation is of some significance when it is considered that the preponderance of numbers considered in the Census data is also of white operators.

Considering that the areas compared are not coextensive, that some features required use of estimates, that a larger proportionate number of Indians were included in the field survey than in the Census data, and that the various crops grown were tabulated for different years, the two sets of data compare as favorably as could be expected. The data gathered in the survey do not represent the entire area under consideration closely, as the method of gathering the data precluded the possibility of including large tracts used for grazing only and owned by absentee landlords. The data do represent the farm operating units within the area and the variations existing among different ownership groups within the study area.

CHAPTER III

SOME GENERAL ASPECTS OF LAND OWNERSHIP AND LAND USE
IN OSAGE COUNTY, OKLAHOMA

Land Ownership in Osage County

The environment in which a man finds himself will give certain direction to the course of action that he will eventually take in the management of his unit. In order to understand the relationship between ownership, environment, and land use in Osage County, it is necessary that we inquire into and understand the developments of ownership in the land as well as some of the physical characteristics of the area. The division of the land, government restrictions on Indian owned land, the size of tracts, changes in ownership, ownership today, and relations between ownership and present use and possible physical uses of the land are some of the problems discussed in this chapter.

Land ownership has a direct bearing on land use. Obviously a large scale cattle rancher uses land in a different manner than individual homesteaders would use the same land. Also, as the study includes different ownership groups, that is, restricted Indians, unrestricted Indians, and white operators, it is necessary to inquire into the proportions of the land owned by each.

The Allotment Act of 1906 provided that the government should retain control of the use and disposal of the Indian owned land, unless the Indian had been adjudged competent and had received a certificate of competency. The removal of restrictions granted the individual Indian concerned legal right to use or dispose of his lands at his own discretion. Certificates of competency have been issued to nearly 67 percent of the adult Osage Indians.^{1/} The Osages today own approximately

^{1/} J. P. Lawyer, Appraiser and Acting Head of the Extension Service, Osage Indian Agency, Pawhuska, Oklahoma. Personal letter dated May 10, 1939.

Table 1. Land Ownership Acreages and Percentages by Ownership Classification, Osage County, Oklahoma

Ownership Classifications	Acreage	Percent- age of Total Acreage	Assessed Land Value	Percentage Land Value of Total Taxed Land	Number of Tracts	Average Size of Tracts	Average Assessed Value Per Acre
A. Tax-Exempt Land							
1. Federal Land	-	-	-	-	-	-	-
2. State Land	1,637	.11	-	-	11	149	-
3. County Land	782	.05	-	-	28	28	-
4. Municipal Land	6,311	.43	-	-	51	124	-
5. Tax-Exempt Indian Land	53,177	3.60	-	-	467	114	-
6. Miscellaneous Tax Exempt	8,906	.60	-	-	51	175	-
Total	70,813	4.80	-	-	608	116	-
B. Corporate Land							
7. Insurance Companies	8,767	.59	60,254	2.98	60	146	6.87
8. Investment Companies	34,259	2.32	145,612	7.21	154	222	4.25
9. Commercial Banks	14,986	1.01	68,475	3.39	119	126	4.57
10. Federal Land Banks	-	-	-	-	-	-	-
11. Oil Companies	25,353	1.71	174,610	8.64	178	142	6.89
12. Railroad Companies	3,006	.20	-	-	47	64	-
13. Miscellaneous Corporations	7,460	.50	48,192	2.38	63	118	6.46
Total	93,831	6.30	497,143	24.63	621	151	5.30
C. Privately Owned Land							
14. Individual Holdings	-	-	-	-	-	-	-
15. Joint Holdings, Estates, and Trusts	804,358	54.40	415,772	20.58	5,518	146	.52
16. Indian Owned Land, not Tax-Exempt	481,550	32.60	1,009,142	49.96	3,558	135	2.10
Total	1,285,908	86.90	1,424,914	70.54	9,076	142	1.11
D. Non-Classified							
17. Rivers and Streams	8,929	.60	-	-	23	388	-
18. No Record of Ownership	1,936	.13	-	-	67	29	-
19. Inadequate Ownership Data	17,520	1.12	97,451	4.82	370	47	5.56
Total	28,385	1.90	97,451	4.82	460	62	3.43
Grand Total	1,478,937	100.00	2,019,508	100.00	10,765	137	3.66

Source: Unpublished data from the Land Ownership and Classification Study, Agricultural Economics Department, Project No. 300, Oklahoma Agricultural Experiment Station, (As of January 1, 1936).

534,000 acres or about 36.0 percent of the total county acreage.^{2/} (See Table 1, page 14). This includes both the tax-exempt and non-tax exempt Indian owned land.

At the time of the division of land in 1906-1907, each individual Osage was entitled to make four choices of land at different times and each selection included approximately 160 acres. Every headright was entitled to designate a one-quarter section of land as a homestead and that homestead was to be non-taxable as long as it was held by the original allottee. As each headright constituted approximately one section of land, the homesteads represented at that time approximately 25.0 percent of the total acreage. On January 1, 1936 only 3.6 percent of the total acreage of the County remained as tax-exempt Indian owned land.^{3/} (See Table 1). Thus it may be concluded that 85.0 percent of the allottees have been certificated at one time or another since 1906.

The remaining non-Indian acreage, approximately 64.0 percent of the total county acreage is held largely as privately owned land. Fifty-four and four-tenths percent of the total acreage is held as joint holdings, estates, trusts, and individual holdings. Tax-exempt lands, which include Federal, State, County, Municipal, and miscellaneous lands, as well as tax-exempt Indian land, represents 4.8 percent of the total county acreage, as of January 1, 1936. All corporate owned land is 6.3 percent of the total.^{4/} (See Table 1).

^{2/} Taken from unpublished data from the Land Ownership and Classification Study, Agricultural Economics Department, Project No. 300, Oklahoma Agricultural Experiment Station, Stillwater.

^{3/} Ibid.

^{4/} Ibid.

Table 2. Land Use by Ownership Groups

Land Use	: Tribal and Trust or Restricted Allotted and Administrative Reserves			: Unrestricted:		: Leased to:		Total	: Leased to
	: Total			: Indian		: Indians		: Operated	: Indians
	: C + D			: Used by		: Owned and		: by	: by Other
	: Non-Indians			: Indians		: Operated		: Indians	: Indians
A	B	C	D	E	F	G	H		
Cultivated Dry	57,521	41,760	15,761	12,131		27,892	2,503		
Irrigated	-	-	-	-		-	-		
Grazed	362,302	303,302	59,000	81,765		140,765	24,690		
Timber Operations	-	-	-	-		-	-		
Other Use	6,440	3,900	2,540	2,102		4,642	504		
Total	426,263	348,962	77,301	95,998		173,299	27,697		
Administrative Purposes	643	-	-	-		-	-		
Idle	11,823	-	-	-		-	-		
Total Net Area	438,729	-	-	-		-	-		

No data

Total estimated tillable acreage in net area

62,000

Total number farms operated: (a) By Indians

233

(b) By Non-Indians

524

Source: From the Annual Report of Extension Workers from January 1, 1938 to December 31, 1938, Osage Indian Reservation, Pawhuska, Oklahoma.

General Use of Osage Indian Owned Land

The information and figures in Table 2, page 16 were taken from the Annual Report of Extension Workers from January 1, 1938 to December 31, 1938, Osage Indian Reservation, Pawhuska, Oklahoma. This table shows the total net area, which is the Tribal and Trust or Restricted Allotted and Administrative Reserves, to be 438,729 acres. This area will be referred to hereafter in this treatise as restricted Indian land. The unrestricted Indian owned and operated land was shown to be 95,998 acres and will be referred to as unrestricted Indian land. This information provides the basis for Table 3, page 18 in which it is broken down and portrayed on percentage bases.

As shown in Table 3, page 18, 33.2 percent of all Indian owned land (including both restricted and unrestricted Indian land) is operated by Indian operators, either restricted or unrestricted. The remaining portion is operated by white operators. There is a slight difference in use between the Indian and white operators as is shown by the 81.2 percent used for grazing by the Indian operators compared to 86.9 percent used for this purpose by the white operators. The Indians tilled in 1938, 16.1 percent of the Indian owned land that they operated in comparison to the 12.0 percent tilled by the white operators operating Indian owned land. The data indicate that the white operators are more interested in leasing Indian owned land for grazing than for other agricultural purposes. As will be seen later, the Indians operate the most arable land they own.

The average size of the operating unit of the Indians operating Indian owned land was 744 acres as compared to an average of 666 acres among the white farmers operating Indian owned land. The topography of the land, character of the soil, and ownership in the

Table 3. Amounts and Percentages of Indian Owned Land Used
by White Farmers and Indians by Kinds of Land Use

Land Use	Indian Lands	Use by Percentage of Total	Acreage Used by Indians	Use by Percentage of Total	Acreage Used by Whites	Use by Percentage of Total
Tilled	69,652	13.3	27,892	16.1	41,760	12.0
Grazed	444,067	85.0	140,765	81.2	303,302	86.9
Other Use	8,542	1.7	4,642	2.7	39,000	1.1
Total	522,261	100.0	173,299	100.0	348,962	100.0

Indian Owned Land

	Indian Land	Restricted	Percentage of Restricted	Unrestricted	Percentage of Unrestricted	Indian Operated	Percentage of Indian Operated	White Operated	Percentage of White Operated
Totals and Percentages	522,261	426,263	81.6	95,998	18.4	173,299	33.2	348,962	66.8

Average size of Indian operating unit - Indian owned land 744 acres

Average size of white operating unit - Indian owned land 666 acres

Average size operating unit - Indian owned land 690 acres

Note: Basic data taken from Table 2.

land are factors influencing the size of operating units generally speaking. The physical characteristics of the County are the major factors affecting the sizes of operating units. About 10.0 percent of the land of Osage County is suitable for the growing of crops and that is mostly in creek and river bottoms. The lands suitable for crops are irregular in shape and usually small in area in comparison to the holdings. In order to obtain a sufficient acreage of tillable land for an economical operating unit for the average farm family, a large operating unit is necessary unless irregular tracts are leased or owned. The usual practice is to lease or own large units and cultivate the bottom land and devote the hilly and rolling parts of the unit to pasturing livestock.

According to the soils map in the 1938 Yearbook of Agriculture, Soils and Men, the soils of the study area fall into the general classifications of Summit-Bates, Florence-Newtonia, and Memphis-Grenada.

"Within the Summit-Bates areas the native vegetation is tall grasses, bunch grass and bluestem predominating. General farming, with corn, oats, and forage crops is commonly practiced in this area. A large acreage is pasture. All conditions make this area well adapted to livestock raising and dairying. Many beef cattle are raised, grazed, and fed. The soils generally are quite productive and sustain a prosperous agricultural population with a good standard of living. The Verdigris and Osage soils are highly productive and largely used for crops. 5/

"In the Florence-Newtonia areas, the predominant native vegetation is big bluestem grass. Little bluestem is also common. The area is well-suited for the production of bluestem grasses and is largely used for this purpose. The mass of stone fragments in the soil discourages cultivation but does not prevent the penetration of grass roots into the highly productive soil." 6/

"In the Memphis-Grenada areas cotton is the most important cash crop in the southern part and it is grown more or less throughout the greater part of the areas. Corn is the main subsistence crop and is widely grown. Tobacco,

5/ Soils and Men, 1938 Yearbook of Agriculture, United States Department of Agriculture, Washington, D. C., p. 1056.

6/ Ibid. p. 1055

clover, alfalfa, wheat, oats, sargo, sweetpotatoes, redtop, soybeans, cowpeas, and hay are produced. Bermuda grass and lespedeza make a luxuriant growth and afford good pasture. Cattle raising is increasingly important." 7/

The topography of the area and the possible uses of the land indicates that the agricultural enterprises should be built around cattle raising and perhaps dairying. Comparatively large operating units appear to be necessary in order to provide sufficient tillable land for the average farm family. The availability of restricted Indian owned land for lease but not for purchase provides the non-Indians opportunities to lease entire units of suitable sizes or additional land to increase non-Indian operating units to suitable sizes.

The study area lies entirely within a type-of-farming area described as "Range livestock, some cash grain" by the Bureau of Agricultural Economics, United States Department of Agriculture. Map prepared in 1930.

The Agricultural Program of the Indian Extension Service

The Annual Report of Extension Workers from January 1, 1938 to December 31, 1938, Osage Indian Reservation, Pawhuska, Oklahoma, included a program of work for the Extension Service. An extract from this Report appears in the Appendix. (See Appendix D).

The principal features of the program having a bearing on land use and soil conservation include: (1) Diversified farming under which it is proposed to establish a well balanced crop system on each farm and increase yields by proper crop rotation. (2) Stock raising; to balance better the number of livestock on each farm. (3) Range management; to increase the acreage allowed for each animal grazed, to plant some grass seeds and bermuda roots each year, and to construct.

some erosion control dams each year. (4) Soil conservation and soil fertility; to increase the interest of Indian landowners in soil conservation and restoration of soil fertility, to induce occupants of Indian owned land to practice contour and strip farming, to interest each Indian farmer in terracing his farm lands where needed, to increase the growing of legumes each year, and to increase the use of farmyard manure and commercial fertilizers.

The program of the Extension Service of the Osage Agency is being sponsored for the purpose of advancing the well being of the Osage Indian farmers. The principal feature of this program is the education and training of the Indian in the physical conservation of their natural resources. This program emphasizes self-sufficiency among the Indians insofar as their resources permit. The program as outlined has been in effect in the main for several years, according to Mr. J. P. Lawyer, Acting Head of the Extension Service, Osage Agency.^{8/}

The immediate economic needs of the Indians, restricted Indians especially, are not pressing and as a result the program of the Extension Service of the Agency is based on a long time point of view. This is why education, training, and soil conservation are stressed rather than economic land use.

Under ordinary conditions, economic forces influence land use and soil conservation practices within a given area. Under the prevailing condition within the study area, government policies affect land use and soil conservation through control exercised by the Osage Indian Agency over restricted Indian owned land. The effect of this control is treated in the chapter following through comparisons of land uses and conservation practices among the restricted Indian,

^{8/} Mr. Lawyer has been associated with the Osage Indian Agency for about 20 years. He stated in a personal interview March 21, 1939, that the agricultural Extension program has not been changed materially in several years.

unrestricted Indian and white operators within the area under consideration. The policy of emphasizing self-sufficiency to the Indian operators is not applicable to all units and to all operators and should be adjusted to apply only to those units upon which self-sufficiency is economical. The great divergencies among the units in the matter of size of units, topography, soil types, crops grown, and abilities of the operators render even general policies and practices applicable in varying degrees.

23

23.

CHAPTER IV

OWNERSHIP AND TENURE, VALUE OF LAND AND IMPROVEMENTS, AND USE OF MACHINERY AMONG THE DIFFERENT GROUPS STUDIED

We now turn to a consideration of the study area and the particular units studied rather than the entire County. The degree of ownership exercised by the operator, the size of the units operated, the relative value of the land and the equipment available to the operator determine the position which the operators have to utilize effectively the land and to follow soil conservation practices on their particular units. These relationships as they are found to exist among the different groups of operators within the study area are now considered.

Ownership and Tenure

The field study showed that 92.5 percent of the restricted Indians, 64.9 percent of the unrestricted Indians, and 28.9 percent of the white farm operators owned all the land they operated. (See Table 4, page 24). Not one of the 40 restricted Indian operators studied leased all the land he operated, and only one unrestricted Indian leased his entire unit. Among the white farmers studied 24 of the 38, or 63.2 percent, leased their units entirely. Seven and five-tenths percent of the restricted Indians, 32.4 percent of the unrestricted Indians, and 7.9 percent of the white operators were found to be part owners. Considering all three groups of operators, we find that 62.6 percent are owners, 21.7 percent lessees, and 15.6 percent are part owners. In Table 5, the same problem is presented as in Table 4, except the relationship is expressed on an acreage basis, and the relative size of operating units is included.

Among the restricted Indian farmers, 84.7 percent of the land is

Table 4. Number and Percentage of Operators Owning, Leasing, Owning and Leasing, Average Ages and Participation in Agricultural Adjustment Administration Program by Ownership Groups, Osage County, Oklahoma

Ownership Groups	:Num-ber :Stud-ied :	:Num-ber :Own-ers :	:Per-cent- :age :Own-ers :	:Num-ber :Leases :	:Per-cent- :age :Leases :	:Number :and :Leasing :	:Percent- :age :Leasing :	:Aver-age :Age :	:Number :Partici-pating :in A. A. A. :Program	:Percent- :age :Partici-pating :in A. A. A. :Program	:Number :Partici-pating :in Range :Program	:Percentage :Partici-pating :in Range :Program
Restricted Indians	40	37	92.5	-	-	3	7.5	38.5	10	25.0	2	5.0
Unrestricted Indians	37	24	64.9	1	2.7	12	32.4	41.8	12	35.1	9	24.3
White Farmers	38	11	28.9	24	63.2	3	7.9	41.6	31	81.6	5	13.2
Total	115	72	62.6	25	21.7	18	15.6	40.6	53	46.1	16	13.9

Source: From field survey conducted in March, 1939. See questionnaire, Appendix A.

owner-operated, and 15.3 percent is leased. All this leased land is leased from other Indians. (See Table 5, page 26, and Figure 1, page 25). In the unrestricted Indian group, 56.9 percent of the land operated is owned by the operators, and the remainder is leased largely from other Indians. Eighty-nine and two-tenths percent of the leased land operated by the restricted Indians is owned by other Indians. Among the 38 white farmers included in this study, 33.7 percent of the land operated was operated by the owners, and 66.3 percent was leased. Of the leased portion of the white operated land, 84.1 percent belongs to Indians. Including all three groups, the 115 operators studied owned 58.6 percent of the land farmed and they leased 41.4 percent. Eighty-eight and four-tenths percent of the total land leased by all operators is Indian owned land.

Most of the land operated by white operators is Indian owned. There is no evidence of restricted Indian operators leasing land from white owners. The calculations presented in the lower part of Table 5 indicate that 3.1 percent of the land operated by Indians (these are all unrestricted) is white owned, whereas 55.7 percent of the white operated land is Indian owned. The restricted Indians operating only 18.1 percent of the land they own as a group have not found it necessary to lease outside owned land as individuals. These figures indicate that the ownership of restricted Indian land is divided among the members of the tribe in such a way as to render it unnecessary for most of the individuals to lease all or even additional land for their units.

The size of the farm may be a factor affecting the utilization of the land.^{1/} It was found on analysis that the holdings or operating

1/ G. W. Forster, Farm Organization and Management, p. 278.

Table 5. Operating Units and Percentage of Land Owned by Ownership Groups

Ownership Groups	:Num-:ber	:Total :Acreage:	:Average: Size	:Acres :Owned :	:Percent-: age :Owned :	:Acres :Leased :	:Percent-: age :Leased :	:Indian Land:Leased (Acres)	:Percentage:of Leased Land In- dian Owned:	:Non-Indian:Leased	:Non-Indian:Percentage
	:	:	:	:	:	:	:	:	:	:	:
Restricted Indians	40	13,279	332	11,249	84.7	2,030	15.3	2,030	100.0	-	-
Unrestricted Indians	37	27,610	746	15,705	56.9	11,905	43.1	10,625	89.2	1,280	10.8
White Farmers	38	12,130	319	4,090	33.7	8,040	66.3	6,760	84.1	1,280	15.9
Total	115	53,019	461	31,044	58.6	21,975	41.4	19,415	88.4	2,560	11.6

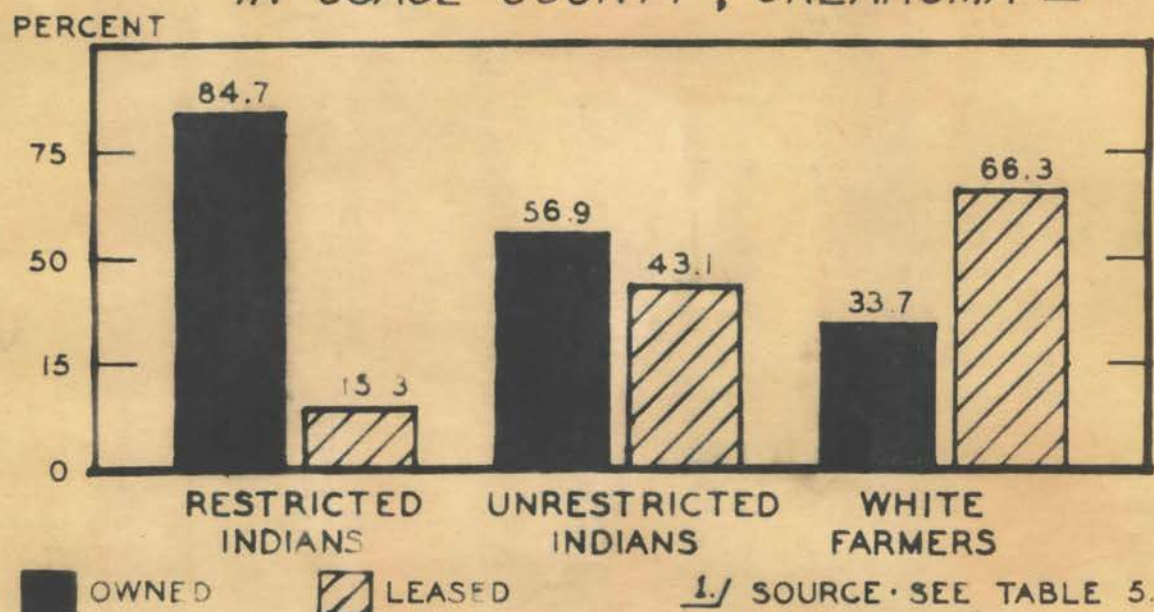
Percent of Indian operated land that is Indian owned	96.9 ^{1/}
Percent of Indian operated land that is white owned	3.1
Percent of white operated land that is Indian owned	55.7
Percent of white operated land that is white owned	44.3

Source: From field survey conducted in March, 1939. See questionnaire, Appendix A.

^{1/} Includes both restricted and unrestricted Indian land.

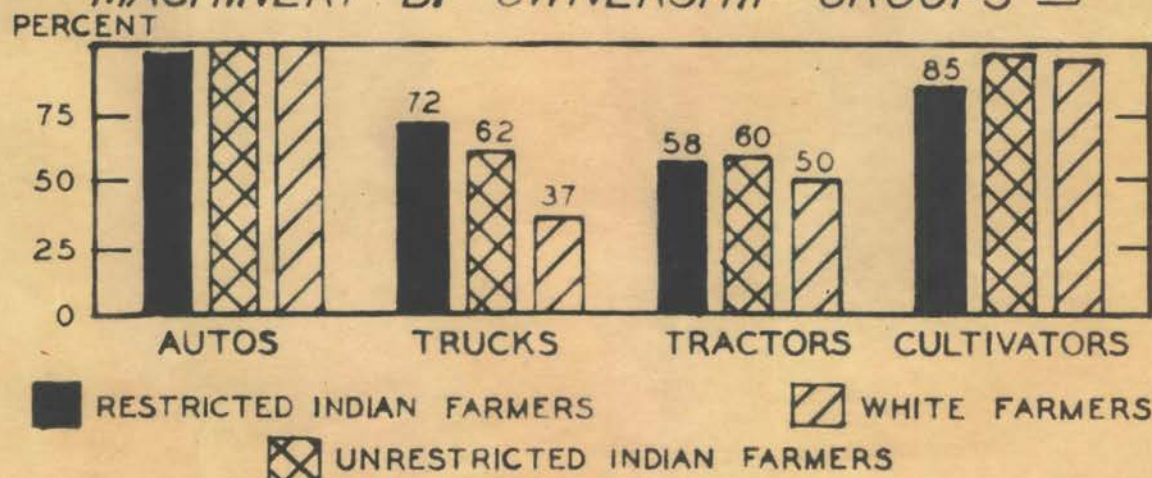
- FIG. 1 -

PERCENTAGE OF LAND OWNED & LEASED
BY OPERATORS BY OWNERSHIP GROUPS
IN OSAGE COUNTY, OKLAHOMA 1/



- FIG. 4 -

PERCENT OWNING VARIOUS KINDS OF
MACHINERY BY OWNERSHIP GROUPS 2/



units coincide closely in size to units lending themselves to legal description, such as quarter sections, half sections, three quarter sections, etc. Only 14 units of the 115 studied were not divisible by 40. The median size operating unit for the study is the 300 acre tract. In the range between 20 to 160 acres, there are 14 restricted Indians, 10 unrestricted Indians, and 22 white operating units. The range between 161 and 240 acres includes five restricted Indians, no unrestricted Indians, and four white operators; 241 to 500 has 14 restricted Indians, seven unrestricted Indians, and eight white farmers; 501 to 1,000, six restricted Indians, 14 unrestricted Indians, and two whites, and over 1,000 acres, one restricted Indian, six unrestricted Indians, and two white operators. The extreme ranges for the restricted Indian operators are 120 acres to 1,420 acres; for the unrestricted Indians, 160 acres to 3,900 acres, and for the white operators, 20 acres to 3,040 acres. The median size of the operating unit for the white operators was found to be 160 acres; for the restricted Indians 280 acres, and for the unrestricted Indians 540 acres.

The mean size of the operating unit is 332 acres among the restricted Indian group, 746 acres among the unrestricted Indian group, and 319 acres among the white group of operators. As a rule, the smaller the operating unit the more intensive is the method or degree of culture, and the less the proportion of the produce that leaves the farm.^{2/} It was found in the study that the larger the units the greater the percentage of the land devoted to pasture use. Also the size of operating units vary directly with practicing of terracing and the ownership

2/ G. F. Warren, Farm Management, p. 268.

of tractors and inversely to the principal crops grown. As farms must be from 150 to 300 acres for efficiency in a type of farming where grain, hay, and livestock are the chief products, ^{3/} it will be seen that a large part of the units in this study conform economically to the types of farming practiced. Considering the above figures relative to sizes of units in relation to efficiency and the characteristic of the study area, it is determined that the most efficient and economical size of units for the study area lies within the units ranging from 150 to 400 acres. Within this range are found 72.5 percent of the restricted Indians, 40.5 percent of the unrestricted Indians, and 60.5 percent of the white operators.

It appears that but few white farmers have been in a position, or have found it desirable, to lease additional land to augment their owned units. As a rule, this group leases all or owns all. The unrestricted Indians follow the practice of leasing additional land generally. This latter group is given preference, possibly, in leasing restricted Indian owned land as the lessee must be satisfactory to the restricted Indian owners as well as to the agency. The effects of the size of units upon erosion and conservation practices will be treated in a subsequent chapter.

Value of Land and Improvements

As is indicated in Table 6A, it is evident that the restricted Indian group has erected and constructed improvements far out of keeping with the value of the land and the extensive use in which the land is placed. These improvements were constructed with incomes from oil largely. The costs of upkeep in most cases offset the utility return of the improvements. The value of improvements in comparison to land, 42 percent,

Table 6. Average Value of Land, Home, Improvements, and Condition of Homes and Improvements by Ownership Groups in Osage County, Oklahoma

Ownership Groups	: Number :	Average:	Average:	Average :	Condition of Homes				Condition of Other			
	: Studied:	Value :	Value :	Value of :	1/				Improvements			
	:	of :	of :	Other Im-	Excellent:	Good:	Fair:	Poor:	Excellent:	Good:	Fair:	Poor
	:	Land :	Homes :	provements :	:	:	:	:	:	:	:	:
Restricted Indians	40	\$19.25	\$4,284	\$1,848	26	12	1	1	23	11	5	1
Unrestricted Indians	37	16.78	2,389	1,131	8	22	7	-	6	22	8	1
White Farmers	38	16.89	1,555	710	4	18	16	-	3	13	21	1
Total	115	17.68	2,773	1,241	38	52	24	1	32	46	34	3

Source: From field survey conducted in March, 1939. See questionnaire, Appendix A.

1/ Refers to general upkeep, repairs and neatness.

as found among the white operators is in keeping with the type of farming and size of units operated by this group. The same is true of the unrestricted Indians who operate larger units and devote more of their land to grazing beef cattle.

The data as presented in Table 6, page 30, indicate that the Indians have retained for themselves the best grade of land. The average value of the land operated by the restricted Indian groups is \$19.75 per acre; the average value of that operated by the unrestricted Indians is \$16.78 and that of the white operators \$16.89. (See Figure 2, page 34). The restricted Indians own 84.7 percent of the land they operate as is shown in Table 5. One of the factors to be considered in arriving at the value of land is its adaptability to crops. The study reveals that there is a direct relationship between value and land use, the greater the value the more of the land planted to crops. Land values also vary directly with good topography and inversely to severe conditions of erosion. It is also indicated that the average value of homes in the restricted group is \$4,284. The average values among the other two groups were found to be \$2,389, and \$1,555 for the unrestricted Indians and white operators, respectively. The median value of homes was found to be \$3,650 for the restricted Indians; \$2,000 for the unrestricted Indians, and \$1,400 for the white operators. The study revealed that the median value of other improvements was \$1,500 for the restricted Indians; \$1,000 for the unrestricted Indians, and \$600 for the white farm operators. The mean value of other improvements is \$1,848, \$1,131, and \$710 among the re-

Table 6A. Value of Improvements in Relation to Land Values

Groups	Value	Value	Value of	Percent Values		Value of	Percent Value
	of Land	of Homes	Other Improvements	Homes of Land	Other Improve- ments of Land	Homes and Im- provements	Improvements of Land
Restricted Indians	255,621	171,350	73,900	67.03	28.91	245,250	95.94
Unrestricted Indians	463,279	88,400	41,850	19.08	9.03	130,250	28.11
White Operators	204,876	59,100	27,000	28.85	13.18	86,100	42.03
Total	923,776	318,850	142,750	34.52	15.45	461,600	49.97

stricted Indians, unrestricted Indians, and white farmers, respectively.
 (See Figure 3, page 34).

The homes and other improvements of the Indian groups have been purchased largely from money received from oil bonuses and royalties instead of from income from the farm upon which they are located. These improvements are economic liabilities in the management of the farms as the upkeep costs more than offset their utility return. Such improvements as barns, artificial water supply facilities, and fences affect the raising of livestock and the growing of crops, as is shown by the fact that the value of other improvements vary directly with the percentage of operators growing wheat and inversely with the number of beef cattle owned.

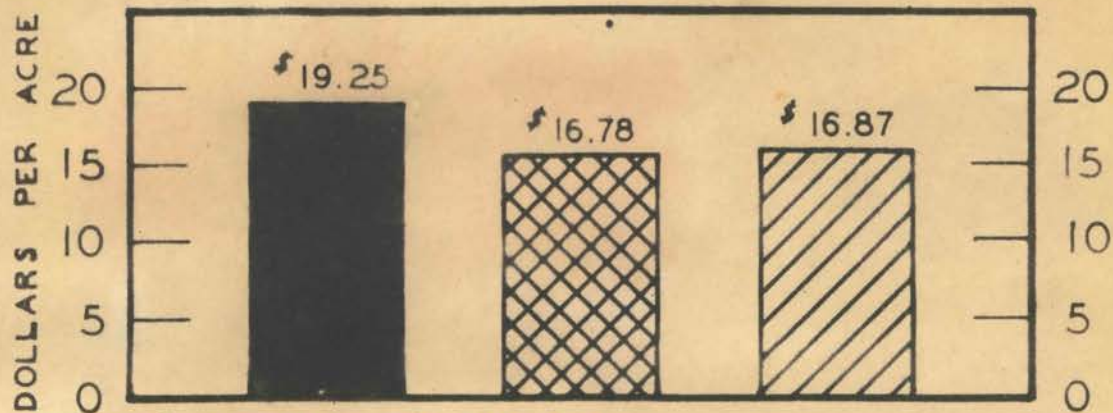
Use of Farm Machinery Among the Groups Studied

The Indians all owned autos. Only one of the 115 operators studied did not own a car, but he owned a small truck. There is some variation among the percentage owning trucks, (See Table 7, page 37, and Figure 4, page 37), 72.5 percent of the restricted Indians, 62.2 percent of the unrestricted Indians, and 36.8 percent of the white operators owned trucks. The percentage owning tractors varied from 50.0 percent among the white operators to 59.5 percent among the unrestricted Indian group. Fifty-seven and five-tenths percent of the restricted Indians owned tractors.

Modern cultivators include tilling machinery for tractors, or riding equipment if horse drawn. The unrestricted Indian group leads in the percentage using modern cultivators, as 97.3 percent of this group owned modern cultivators as compared to 94.7 percent of the white operators. (See Table 7). Hay equipment, such as hay-balers and hay rakes, are not so generally needed as other types of machinery. Only a few of

— FIG. 2. —

*AVERAGE PER ACRE VALUE OF LAND OPERATED
BY DIFFERENT OWNERSHIP GROUPS STUDIED IN
OSAGE COUNTY, OKLAHOMA **

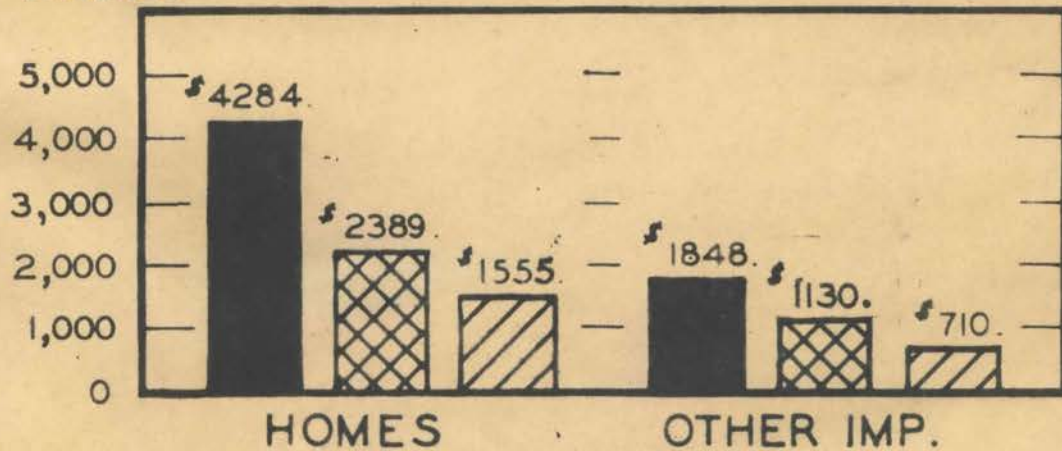


* SOURCE - SEE TABLE 6.

— FIG. 3. —

*AVERAGE VALUE OF HOMES
AND OTHER IMPROVEMENTS
AMONG DIFFERENT OWNERSHIP GROUPS **

DOLLARS



■ RESTRICTED INDIAN FARMERS ▨ WHITE FARMERS
 ▩ UNRESTRICTED INDIAN FARMERS

* SOURCE SEE TABLE 6.

the smaller units contained a sufficient acreage of hay meadow to justify the purchase of modern hay equipment. Most of the alfalfa grown is pastured down and plowed under for soil building purposes. Also, it was learned in discussions with the owners of hay equipment that many of them hire out their equipment and services to others. Forty-two and five-tenths percent of the restricted Indians, 35.1 percent of the unrestricted Indians, and 10.5 percent of the white operators owned hay equipment. The percentage of the land in hay meadow was found to be 2.2 for the restricted Indians, 3.4 for the unrestricted Indians, as compared to 1.7 percent for the white operators. (See Table 9, page 46). The use of this equipment also correlates closely with the number of hired help among the three groups. (See Table 13, Appendix B). Thirty-three of the 40 restricted Indians hired 38 farm hands; 26 of the 37 unrestricted Indians hired 33 hands, and 11 of the 38 white operators hired a total of 19 farm hands. The use of other machinery, including combines, threshers, drills, etc., correlates closely with the use of tractors.

It has been found that the value of the land varies directly with diversity in land use, and acreage devoted to soil building crops. Land values vary inversely to severe conditions of soil erosion. The size of operating units by groups vary directly with the ownership of tractors and acres in native hay meadow and inversely with tilled crops.

The data indicate that the Indian groups have more farm machinery than the white farmers. As between the two Indian groups, the restricted Indians have slightly more equipment than the unrestricted Indian operators. This condition is attributed largely to the Indian's wealth and income from oil and to the Agent's lenient policy in permitting the restricted Indians to spend their restricted funds for farm equipment and

machinery. However, judging from the acreages tilled per tractor (Table 7A) the unrestricted Indians utilize tractors more efficiently than the restricted Indians or white operators. The same holds true in regard to work animals but the white operators are more efficient in this respect than the restricted Indians.

Assuming that family labor to be the same among the groups and judging from the cultivated acreage per hired hand, the white operators use hired labor more efficiently than the Indians do and the unrestricted Indians more efficiently than the restricted Indians. This reflects better management of labor on the part of the white operators as well as the use of labor by the restricted Indians to keep up their expensive improvements.

The efficiency in use of horsepower and machinery varies inversely with the value of the land reflecting more intense applications on the more valuable land. Efficiency in use of hired labor varies directly with immediate economic needs of the operator and inversely with good crop rotation and effective erosion control measures. The efficiency in the use of machinery, hired labor, and work animals does not vary consistently among themselves nor among the ownership groups. Even though the Indians possess more capital generally and have costlier outlays, there is no consistent indication that the white operators are more efficient in their use of the factors of production.

The restricted Indians own the most valuable land; they are the predominant owner-operator group, owning twice as much land as they operate and they lease out to unrestricted Indians and white operators the land they do not operate themselves. The restricted Indians own the most valuable homes and other improvements. They own more farm machinery than

the unrestricted Indians or the white operators. In the matter of land ownership and values of homes and other improvements, the unrestricted Indians are better supplied than the white farmers.

The fact that the restricted Indians operate the most valuable land and have the most valuable homes and other improvements is attributable to their income from oil royalties and bonuses and to the control of expenditures by the Agency. The unrestricted Indians also profited from oil developments but to a lesser degree as generally they are of lesser degree of Indian blood than the restricted Indians. With the economic advantage of superior land to operate, better improvements, and sufficient operating capital the Indian groups and especially the restricted Indians are in a better position than the white operators to follow an extensive long time soil conservation program.

There is a need for the establishment of a cost accounting system among the Indian farmers of Osage County to determine accurately the profits, if any, made by the Indians in agriculture. The oil incomes of the Indians have been directed, to some extent, into agricultural undertakings and soil conservation practices with results and returns that have not been determined. The fusion of oil money into agriculture under direction of the agency has resulted in expenditures in operations that might not have been economically advisable under ordinary circumstances. However, the experience and knowledge in agriculture and the high standard of living among the Indians as reflected in values of homes offset the costs. Nevertheless, the fact remains that the conservation practices, whether economical or not, affect the physical being of the soil and land, and the future economic welfare of the individuals and the community.

Table 7A. Efficiency In Use of Machinery, Labor, and
Work Animals by Ownership Groups, Osage County

39.

Groups	: Acres : : In : : Crops :	Acres : Per : Tractor :	Acres : Per Work : Animal :	Acres : Per Hired : Hand :	Cattle Per Hired Hand
Restricted Indians	4,329	188	14	114	22
Unrestricted Indians	4,988	226	22	151	65
White Operators	3,588	189	17	189	68
Total	12,815	203	17	142	48

Considering only the relationships between power and land and hired labor and land, there is little evidence that a further extension of white ownership or operations of the land in the study area would result in more economic production. This is not to imply that the Indians are operating their farms as efficiently as it is possible to operate them but rather that extension of white operation similar to that already being practiced would not materially improve the productive efficiency.

CHAPTER V

CROPS GROWN AND LIVESTOCK OWNED BY DIFFERENT
OWNERSHIP GROUPS

Economic consideration determines the uses to which different kinds of land will ultimately be devoted. As the crops grown and the livestock raised are to some extent mutually dependent and the two combined provide the major determinant of land use, we now turn to a detailed analysis of the crops grown and livestock raised among the various operators in Osage County. By combining crop and livestock enterprises the risk of failure to derive income is decreased.^{1/} Misuse of land, lack of crop rotation and failure to plant soil building and soil conserving crops are the major influences causing excessive erosion. The kind and number of livestock raised in proportion to the acreage pastured, other things being equal, determine the severeness of the problem of overgrazing which in turn affects erosion and erosion control.

Principal Crops Grown by Different Ownership Groups
in Osage County, 1939

The situation concerning the principal crops grown is treated on the basis of the percent in each group growing the various crops. This method of presentation lends itself to a significant comparison among the different groups rather than a comparison of the percentage of acres devoted to the various crops. In the ultimate problem of the relationship between the crops grown and soil conservation by ownership groups a consideration of the percent of the operators growing the various crops is necessary.

The crops considered in Table 8 are not only the principal crops but include practically all the field crops grown in Osage County at

^{1/} Llewellyn A. Moorhouse, The Management of the Farm, p. 436.

this time. Vegetables and fruits are not included. Seventy percent of the restricted Indian farmers, 56.8 percent of the unrestricted Indian farmers, and 84.2 percent of the white farmers grew corn in 1938. The average acreage was greatest among the unrestricted Indians; it being 20.8 acres for that group as compared to approximately 15 acres for the other two groups. The percentages of the operators growing wheat were found to be 85.0 for the restricted Indians, 75.5 for the unrestricted Indians, and 71.0 for the white farmer operators. The average acreage of wheat grown was found to be 37.9 acres among the operators of the unrestricted Indian group as compared to approximately 50 acres for the other two groups. The percentages growing oats are about the same as those growing wheat, and again the unrestricted Indian farmers grow the greatest average acreage.

Alfalfa is usually grown as a soil building crop; the practice being to pasture it for a year or two and then plow it under and follow with row crops. This practice is economical in cases where sufficient livestock is available to utilize fully the alfalfa crop, and in units in which the immediate needs for alternative crops are not pressing. This crop was grown last year by 40.0 percent of the restricted Indians who grew on an average 20.6 acres each; 32.4 percent of the unrestricted Indians grew 15.1 acres on an average, and 28.9 percent of the white operators grew an average of 13.4 acres. (See Table 8, page 43 and Figure 5, page 44). Alfalfa acreage was found to vary directly with the acreages planted to wheat and oats and inversely to the number of livestock units owned. This being the case and the fact that alfalfa acreage varies directly with other soil building crops, it appears that alfalfa is planted principally for soil building purposes. Alfalfa acreages vary directly with the value of the

Table 8. Principal Crops Grown in 1938 by Different Ownership Groups
Osage County, Oklahoma

Ownership Groups	: Number : : Studied :	: Percent : : Growing :	: Average : : Acreage : : 1/ :	: Percent : : Growing :	: Average : : Acreage :	: Percent : : Growing :	: Average : : Acreage :	: Percent : : Growing :	: Average : : Acreage :	: Percent : : Growing :	: Average : : Acreage :
		: Corn :		: Wheat :		: Oats :		: Alfalfa :		: Other Hay :	
Restricted Indians	40	70.0	15.2	85.0	51.3	87.5	33.3	40.0	20.6	52.5	20.8
Unrestricted Indians	37	56.8	20.8	75.7	87.9	70.3	44.8	32.4	15.1	40.5	33.7
White Farmers	38	84.2	15.9	71.0	48.0	71.0	22.5	28.9	13.4	63.2	27.5
Total	115	70.4	16.9	77.4	61.8	76.5	33.4	33.9	16.9	52.2	26.7

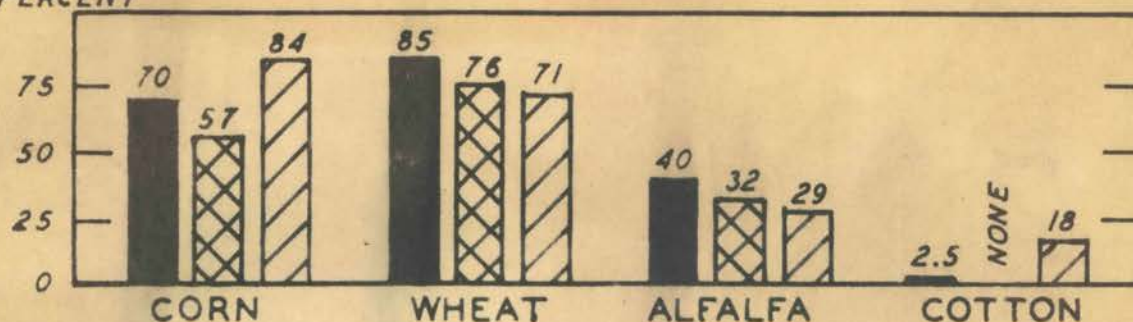
Ownership Groups	: Number : : Growing :	: Average : : Acreage :	: Percent : : Using Pasture : : Land :	: Average : : Acreage :	: Percent : : Growing Hay : : Meadow :	: Average : : Acreage :	: Percent : : Growing : : Cotton :	: Average : : Acreage :
Restricted Indians	35.0	14.9	100.0	217	30.0	23.9	2.5	20.0
Unrestricted Indians	35.1	18.4	100.0	586	54.0	46.2	-	-
White Farmers	47.4	15.9	100.0	219	23.7	23.3	18.4	12.1
Total	39.1	16.3	100.0	336	35.6	34.7	7.0	13.1

Source: From field survey conducted in March 1939. See questionnaire, Appendix A.
1/ Average acreage among those growing each crop in all cases.

— FIG. 5. —

PERCENT GROWING VARIOUS CROPS BY
OWNERSHIP GROUPS : OSAGE CO., OKLA. ^{1/}

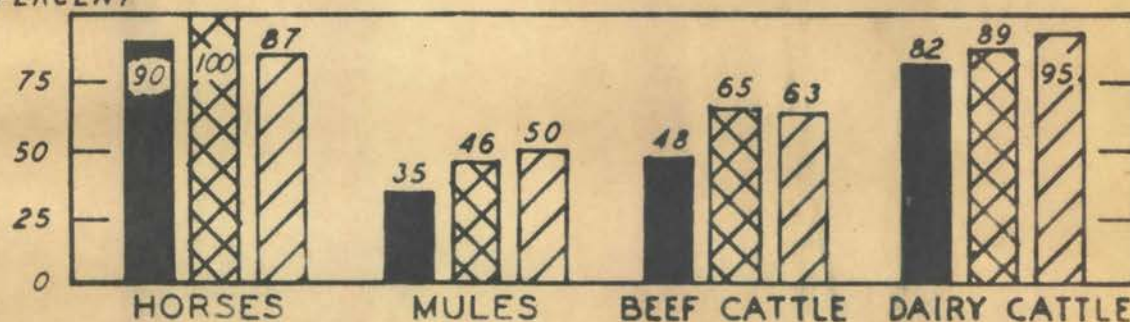
PERCENT

^{1/} SOURCE : SEE TABLE 8

— FIG. 6. —

PERCENT OWNING VARIOUS LIVESTOCK BY
OWNERSHIP GROUPS : OSAGE CO., OKLA. ^{2/}

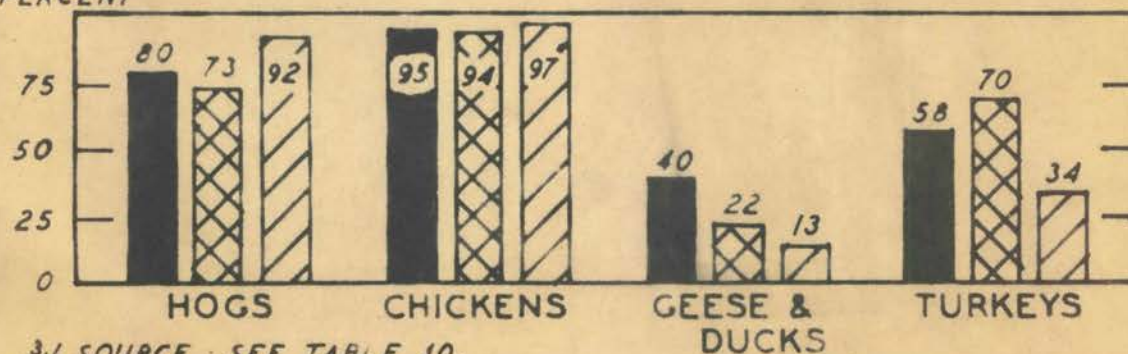
PERCENT

^{2/} SOURCE : SEE TABLE 10

— FIG. 7. —

PERCENT OWNING HOGS AND POULTRY BY
OWNERSHIP GROUPS : OSAGE CO., OKLA. ^{3/}

PERCENT

^{3/} SOURCE : SEE TABLE 10.

■ RESTRICTED INDIAN FARMERS

▨ UNRESTRICTED INDIAN FARMERS

▧ WHITE FARMERS

land. From a soil building point of view, the owner-operator class is more interested in growing alfalfa than the tenant class of operators. Both the percentage growing alfalfa, and the average acreage grown varies directly with the degree of ownership the operators have in the units operated.

Other hay includes sudan, kafir, cane, hegari, and other crops planted primarily for hay. Fifty-two and five-tenths percent of the restricted Indians, 40.5 percent of the unrestricted Indians, and 63.2 percent of the white operators grew other hay crops. The average acreage of hay crops ranged from 20.8 acres among the restricted Indians to 33.7 acres among the unrestricted Indians; the white farmers grew on an average 27.5 acres. Acreages planted to other hay crops vary directly with acreages of barley, cotton, and corn, and inversely to ownership of tractors and acreages devoted to native meadows. Evidently other hay crops are planted to supplement corn as a feed crop in units not having sufficient native hay meadows to provide enough hay.

Very little cotton is grown in Osage County insofar as the area under consideration can be taken as a criterion for the County. In 1938, only one of the 40 restricted Indians studied grew cotton, and none of the unrestricted Indians grew this crop.^{2/} Eighteen and four-tenths percent of the white farmers studied grew on an average 12.1 acres of cotton last year. (See Table 8, page 43 and Figure 5). Some of the

^{2/} A few years ago, according to Mr. Edward W. Mitchell, Farm Agent, Osage Agency, over half of the Indian operated cropland in the vicinity of Hominy (in Osage County) was devoted to cotton, but now Mr. Mitchell says the Agency discourages the crop in favor of other crops more suited to the area and to a more self-sufficing cropping and livestock system.

Table 9. Land Use.
Acreages and Percentages of Land Devoted to Different Uses, Osage County, Oklahoma

Ownership Groups	: Number Studied	: Total Acreage in Farms	: Corn Acreage	: Per-cent-:age : Corn	: Wheat Acreage	: Per-cent-:age : Wheat	: Oats Acreage	: Per-cent-:age : Oats	: Alfalfa Acreage	: Percent-:age : Alfalfa	: Other Acreage	: Percent-:age : Other
Restricted Indians	40	13,279	426	3.2	1,743	13.1	1,166	8.8	329	2.5	436	3.3
Unrestricted Indians	37	27,610	436	1.6	2,460	8.9	1,166	4.2	181	.7	506	1.8
White Farmers	38	12,130	508	4.2	1,295	10.7	607	5.0	148	1.2	659	5.4
Total	115	53,019	1,370	2.6	5,498	10.4	2,939	5.5	658	1.2	1,601	3.0

Ownership Groups	: Barley Acreage	: Percent-:age : Barley	: Pasture Acreage	: Percent-:age : Pasture	: Hay Acreage	: Percent-:age : Hay	: Cotton Acreage	: Percent-:age : Cotton	: Total Acreage	: Percent-:age : All Crops
Restricted Indians	209	1.6	8,663	65.2	287	2.2	20	.2	4,616	34.8
Unrestricted Indians	239	.9	21,697	78.6	925	3.4	-	-	5,913	21.4
White Farmers	285	2.4	8,332	68.7	210	1.7	85	.7	3,798	31.3
Total	734	1.4	38,692	73.0	1,422	2.7	105	.2	14,327	27.0

Source: From field survey conducted in March, 1939. See questionnaire, Appendix A.

rolling land of the study area is suitable for cotton growing and can be more effectively devoted to this crop than to other cash crops. Acreages devoted to cotton vary directly with corn and barley acreage and inversely to total acres operated. This is consistent as cotton, being a crop requiring much labor, is grown by the group operating the smallest acreages.

In summarizing the percentages and acreages devoted to the various crops by groups it is found that the restricted Indians devote a greater percent of their land to wheat, oats, and alfalfa than do the other groups. The unrestricted Indians have a large percent of their land devoted to growing hay meadows and to pasture use. Among the white operators the percentage of land devoted to barley, cotton, corn, and hay crops exceeds the percentage of acreage for these crops in the other groups. The percentage of land devoted to all crops was found to be 34.8 for the restricted Indians, 31.3 for the white operators, and 21.4 for the unrestricted Indians.

Considering the higher percentage of restricted Indians growing the various crops and the relationship between these percentages and the acreage devoted to the various crops it will be seen that this group has the greatest possibility of adhering to a satisfactory system of crop rotation. By the same reasoning it will be observed that the white operators have a better possibility of rotating their crops than do the unrestricted Indians.

Livestock and Poultry by Ownership Groups, Osage
County, Oklahoma, 1939

The number and kind of livestock raised affects land use. The relationship between the number of livestock units grazed and the available pasture land determines, assuming equal carrying capacity, to a

Table 10. Percent Owning and Average Number of Different Kinds of Livestock and Poultry by Ownership Groups, Osage County, Oklahoma, March 1939

Ownership Groups	Number: Owned	Percent: Owning	Average: Number	Percent: Owning	Average: Number	Percent: Owning	Average: Number	Percent: Owning	Average: Number	Percent: Owning	Average: Number	Percent: Owning	Average: Number
Restricted Indians	40	90.0	7.3	35.0	2.9	47.5	41.1	32.5	4.8	2.5	19.0		
Unrestricted Indians	37	100.0	4.8	45.9	3.2	64.9	76.8	39.2	9.6	10.8	56.8		
White Farmers	38	86.8	5.1	50.0	2.3	63.2	38.3	94.7	10.4	18.4	13.9		
Total	115	92.2	5.7	43.5	2.8	58.3	52.9	86.7	8.3	10.4	28.6		
Ownership Groups													
Restricted Indians	80.0	10.4	95.0	91.3	40.0	14.2	57.5	20.7	22.5	14.1			
Unrestricted Indians	73.0	16.7	94.6	115.4	21.6	14.1	70.3	19.7	21.6	11.4			
White Farmers	92.1	15.4	97.4	104.3	13.2	4.0	34.2	10.8	39.5	13.7			
Total	91.7	14.1	95.6	103.4	25.2	12.4	53.9	16.2	27.8	13.2			

Source: From field survey conducted in March, 1939. See questionnaire, Appendix A.
 1/ Average of those owning various livestock -- not average of all operators studied.

large extent whether the pasture land is overgrazed. Overgrazing affects erosion and erosion control.

All the unrestricted Indians studied, and 90.0 percent of the restricted Indians owned horses as compared to 86.8 percent of the white farmers studied.^{3/} The average number owned was greatest among the restricted Indian group, being 7.3 as compared to 4.8 and 5.1 among the unrestricted Indians and white operators, respectively. (See Table 10 and Figure 6, page 44). In the matter of ownership of mules, the percentage among the restricted Indians is smallest being 35.0 percent for this group as compared to 45.9 percent among the unrestricted Indians, and 50.0 percent among the white operators. The average number of mules owned varies from 2.3 for the white operators to 3.2 for the unrestricted Indians. The restricted Indian farmers own on an average 2.9 mules.

Rougher and poorer grades of land can be operated economically in beef cattle raising, particularly in areas that produce abundant supplies of roughage or large quantities of coarse grains.^{4/} Forty-seven and five-tenths percent of the restricted Indians owned beef cattle as compared to approximately 64.0 percent for the other two groups. The average number owned is 76.8 among the unrestricted Indians as compared to approximately 40 for each of the other groups.

^{3/} "In recent years when it was decided by officials of the Indian Agency that most of the Indians would be benefited by the disposal of some of their horses, it was difficult to induce them to sell horses for which they had no use." Mr. J. P. Lawyer, Appraiser and Acting In Charge of the Extension Service, Osage Agency, Pawhuska, Oklahoma. Personal interview, March 27, 1939.

^{4/} Moorhouse, op. cit., p. 333.

Ownership of beef cattle was found in this study to vary directly with the roughness of the topography and inversely with land values.

A greater percentage of operators owned dairy cattle than owned beef cattle but the average number owned was very much smaller. The percentage owning dairy cattle, as well as the average number owned by groups, progressed almost uniformly from 82.4 percent among the restricted Indians to 94.7 percent among the white operators, and from an average number of 4.8 to 10.4.

Eighty percent of the restricted Indians owned an average of 10.4 hogs each, 73.0 percent of the unrestricted Indians owned on an average 16.7, and 92.1 percent of the white farmers owned on an average 15.4 hogs each.

Over 95.0 percent of all operators owned chickens and on an average approximately 100 each. Ninety-five percent of the restricted Indians owned on an average 91.3 chickens each, 94.6 percent of the unrestricted Indians owned on an average 115.4, and 97.4 percent of the white operators owned on an average 104.3 chickens each. (See Table 10 and Figure 7).

In summarizing the data concerning crops and livestock by ownership groups it is found that the unrestricted Indians utilize a larger percentage of their lands as pastures and own more beef cattle. The restricted Indians and white operators practice a more diversified type of farming generally. The restricted Indians and white operators plant more soil building crops than the unrestricted Indians. The unrestricted Indians tend more toward a commercial livestock-cash grain economy in that they emphasize more the growing of wheat and oats and the raising of beef cattle. The restricted Indians and white operators, practicing a more general type of farming, are in a better

position to adhere to a satisfactory crop rotation system.

The diversification of the crops produced varies directly with the best topography, acreage devoted to croplands, and the value of the land. The raising of beef cattle varies directly with the worst condition of erosion, hilly topography, and a higher percentage of the land used for pasture purposes. The number of beef cattle owned varies inversely with the value of the land and the practice of planting soil building crops.

The economic efficacy of the agricultural endeavors of the groups would place the white operators first, unrestricted Indians, and restricted Indians in descending order. Because of the lack of outside income, the practices of the white farmers tend to be predicated upon economic efficiency. This condition was found to vary directly with overgrazing, participation in the Agricultural Adjustment Administration program, and the ownership of dairy cattle and varies inversely with crop rotation, effective erosion control measures, and ownership of land.

Considering the physical and economic factors determining the possibilities of land use and the present use of the land within the study area it is evident that no great change in land use is necessary or advisable. Analysis of variations by groups in the matter of crops grown and livestock raised indicates that the white operators farm slightly more intensively than the Indians. The white operators crop a larger percentage of their land and own more livestock and poultry generally speaking but the Indians raise more beef cattle. These deviations in land use among the different groups is attributable to differences in topography and sizes of units rather than to the differences in abilities between the Indians and white operators. Restriction or extension of Indian operation of the land would not affect materially land use.

The principal land use problem in the study area is to prevent waste of the soil. Erosion control is the paramount problem and the relationships existing between land ownership, topography, land use, and influences by governmental agencies are treated in the following chapter.

CHAPTER VI

EROSION AND EROSION CONTROL MEASURES

Having determined that the land use problem within the study area is a problem of preventing soil waste by erosion and depletion rather than a problem of adjustment in land use, we now turn to a consideration of erosion and erosion control.

Permanency and economic stability in agriculture involves erosion control. Better cultivation and erosion control aid in forming the basis for giving both the farmer and the consumer more products at less cost. Insofar as erosion and erosion control affects siltation of streams, and reservoir, floods and flood control, public owned land and the general welfare, present and future, through lower prices to consumer and greater profits to operators, erosion control is of social importance and the expenditure of public funds for this purpose is justified.^{1/}

Any conservation program, public or private, should be based upon the findings of a careful technical and economic research within the area under consideration. The immediate and ultimate effects of proposed measures or changes should be studied carefully. If our present knowledge of the physical approaches required for soil conservation is to have widespread effect on farm practices, economic conditions, and relations must be favorable. Financial aid is necessary to permit farmers to change land use and conserve the soil where initial costs, upkeep and temporary or permanent loss of incomes are involved. The tenant system usually stands directly in the way of private conservation practices.

Retaining and regaining soil fertility is generally regarded as

1/ Journal of Farm Economics February, 1939, p. 101.

a private rather than a public problem. Even though the public is concerned with the fertility of the soil, the returns from increased fertility accrue directly and more immediately to the operator. The tenant system does not affect adversely the problem of maintaining soil fertility to as great an extent as it affects soil conservation.

The relation as found to exist in the study area between physical and economic forces on one hand and the condition of erosion and the erosion control measures on the other are now considered.

The topographic features of an area determine to a large extent the possibilities of uses of the land. Certain types of farming can be developed and conducted at less cost on level or gently rolling land than on hilly or rough land.^{2/} It seems wise to inquire as to the topography of the study area and consider the data presented with a view of showing the relationship between the topography and land use as found among the different ownership and operating groups.

Topography of Area Studied

Generally speaking, the topography of the area studied, as well as that of the entire Reservation, ranges from level creek and river bottom land to very rough hilly land. Most of the land is rolling to hilly. The questionnaire used in the field survey includes four general classes of topography; level, rolling, hilly, and very hilly. (See questionnaire, Appendix A).

The data taken from the field survey reveals that 67.5 percent of the restricted Indian operated units contained some level land as compared to 48.6 percent and 55.3 percent for the unrestricted Indian and

2/ Llewellyn A. Moorhouse, The Management of the Farm, p. 29.

white operated units, respectively. (See Table 11, page 61). Ninety percent of the restricted Indian operated units, 89.2 percent of the unrestricted Indian operated units, and 84.2 percent of the white operated units contain some rolling land. The unrestricted Indian group operates units of which 35.0 percent contain some hilly land as compared to 10.0 percent in the other groups. The unrestricted Indian operated units also have a larger percentage containing very hilly land.

Generally speaking the data indicate that the restricted Indian operated units contain slightly more level land, about the same rolling and hilly land, and less very hilly land than the other groups. The unrestricted Indian operated units contain less level land and more hilly land than is found in the other groups. Thus, from a topographic point of view, the restricted Indians operate the most level land, the white farmers operate the rolling land, and the unrestricted Indians operate the roughest land. When these data are correlated with land use it is found that the groups operating the best land, from a topographic point of view, have the greatest percentage of their land in crops. (See Table 9). Also, the better the topography the more the value of the land and the greater is the diversity of crops grown. The best topography varies indirectly with the percentage of land devoted to pasture use and to the raising of beef cattle.

Conditions of Erosion by Ownership Groups

The conditions of erosion and the relationship existing between these conditions and the percentage of land in cultivation is next considered. These relationships are treated by groups of operators and an analysis is made of the influences and effects of these influences upon the different groups.

The data in Table 11 show the conditions of erosion that were found to exist upon inspection at the time of the field survey. Analyzing these data by groups, it is found that 5.0 percent of the restricted Indian operated units, 8.1 percent of the unrestricted Indian operated units, and 10.5 percent of the white operated units are severely eroded. Forty-seven and five-tenths percent of the restricted Indian units, 62.2 percent of the unrestricted Indian units, and 36.8 percent of the white operated units contained lands moderately eroded. Of these units on which slight erosion is apparent, 27.5 percent are operated by restricted Indians, 27.0 percent by unrestricted Indians, and 31.6 percent by white operators. On lands having no erosion were found 20.0 percent of the restricted Indian operated units, 2.7 percent of the unrestricted Indian operated units, and 21.0 percent of the white operated units. (See Figure 8, page 62).

Generally speaking, the data presented above indicate that the units operated by white farmers are in a better condition from an erosion viewpoint than the units operated by the other groups; that the restricted Indian operated units are second best relatively speaking, and the unrestricted Indian operated units have the worst erosion problem.

Erosion Control and Soil Building Measures Employed by Ownership Groups

The present state of erosion is of sufficient severity as to require considerable erosion control and soil conservation practices. The means of soil conservation under consideration in this study include terracing and strip cropping and apply only to croplands. From a soil building point of view, crop rotation and the planting of certain soil building crops are considered.

Thirty-one and three-tenths percent of the total units inspected

were found to be terraced, and 54.9 percent of the units were found to be in need of terracing. (see Table 12, page 64). The remaining 13.9 percent did not need terracing. Analyzing these data by ownership groups, it is found that 27.5 percent of the units operated by restricted Indians, 45.9 percent of those operated by unrestricted Indians, and 21.0 percent of the units operated by white farmers are terraced. Those units not terraced in which terracing is needed are operated by groups as follows: restricted Indians 57.5 percent, unrestricted Indians 48.6, and white operators 57.9 percent.

These data indicate that the unrestricted Indians have done the greatest amount of terracing; the cropland operated by restricted Indians is next, and that of the white farmers the least terraced. Terracing varies directly with the size of the operating units and the severity of the conditions of erosion, but not with the acreages cultivated. The unrestricted Indians have the worst eroded land and have been so late in adopting conservation measures that terracing became more necessary for this group. These data indicate that approximately one-third of the total units inspected which were found to be in need of terracing have been terraced.

The unrestricted Indians operating the most eroded land have terraced more than the other groups, and the white operators with the least eroded land have terraced less than the other groups. These facts indicate that the unrestricted Indians, being outside the direct influence and control of the Agency, permitted their land to erode until compelled by the exigencies of the situation to counter with more terracing. Also, this group operates the most hilly land. The white operators terracing the least are the group having the smallest equity in the land they operate.

The practice of planting strip crops for soil conservation purposes is practiced but little in the study area. Only 2.5 percent of the restricted Indian operated units, 5.3 percent of the white operated units were found to be protected by strip crops, and the unrestricted Indian group planted no strip crops. (See Table 12).

Most of the operators studied have a crop rotation system, but only about one-half were adjudged to be adequate, as is shown in Table 12. It is realized that there are only limited possibilities of adhering to a good rotation system in an area, such as the study area, in which similar crops, such as wheat, oats, and barley predominate. However, this limitation was considered when rating the systems "good" or "poor" and operators were given credit when they were making a conscious effort to follow a satisfactory predetermined system. A satisfactory system was taken to be one in which small grain crops were followed by row crops one year out of three and/or in which small grain crops or legumes were planted to be pastured down and turned under one year, at least, out of four. Information relative to crops planted on various tracts during the past years, as well as future planting intentions were taken from the operators and accepted as given without question.

The data indicate that a higher percentage of restricted Indian operators have a good crop rotation, although the percentage rotating is slightly lower than that of the white farmers; that fewer of the white farmers follow good rotation systems even though most of them rotate their crops; and, that fewer of the unrestricted Indians practice crop rotation than any group, and such rotations are about as effective as the whites. Effective crop rotation varies directly with land ownership, the group owning the largest percentage of land operated

by them employ the most satisfactory system of crop rotation. Crop rotation varies directly with availability of capital and inversely to the immediate economic needs which indicates that oil wealth has influenced the Indians in the matter of crop rotation.

Soil and Pasture Improvements

In considering further the information presented in Table 12, the next phase of the discussion pertains to the planting of soil building crops and the overgrazing of pasture lands. (See Figures 8 and 9). In determining whether or not a crop was soil building, consideration was given to the primary purpose for which the crop was planted, rather than to the kind of crop. All crops plowed under for the purpose of enriching the soil in addition to other crops with soil building properties were considered in arriving at the effectiveness of crop rotation and soil building. It was found that 67.5 percent of the restricted Indian operators planted soil building crops as compared to 24.3 percent, and 39.5 percent of the unrestricted Indians and white operators, respectively.

The practice of planting soil building crops does not vary with severity of erosion. The group operating the most level land planted more soil building crops, as well as other crops, and vice versa. (See Tables 11 and 12). This condition can be attributed to the fact that the group planting more soil building crops exercises a greater degree of ownership over the acreage operated. Also, the restricted Indian group is under the influence and control of the Agency's Extension Service Program. The white group, planting the second most acreage to soil building crops, although operating most leased land, feels more the influence of the Agricultural Adjustment Administration conservation program. Benefit payments for conservation and soil building prac-

tices accrue to the operator rather than to the landowner.

Twenty percent of the restricted Indian operators overgrazed their pasture land as compared to 29.7 percent of the unrestricted Indians, and 26.3 percent of the white operators. There is no consistent relationship between overgrazing of pasture land and conditions of erosion on the croplands of the same operators. However, the effects of overgrazing were more pronounced in the hilly lands and least so on the more level lands. Overgrazing of hilly land results in the formation of gullies more readily than on level land. The conditions of erosion in the pasture land was the principal criterion in determining overgrazing in the past. Condition of the grass determined largely the amount of overgrazing at the present. Overgrazing varies directly with the immediate economic needs of the operators; the number of dairy cattle owned and participation in the Agricultural Adjustment Administration program.

The Effects of Soil Erosion Control Measures

In order to be effective, erosion control measures must be adequate to meet the particular needs and must be applied where needed. This question and the relationships existing between the measures adopted and the topography, crops grown, rotation of crops, and the practice of planting soil building crops is now treated.

✓ In arriving at the ratings of effectiveness of the soil conserving practices observed and recorded, consideration was given to crop rotation and the planting of soil building crops, as well as to terracing and strip cropping. Through proper crop rotation, and by utilizing soil building crops, soil is made more absorptive and therefore less

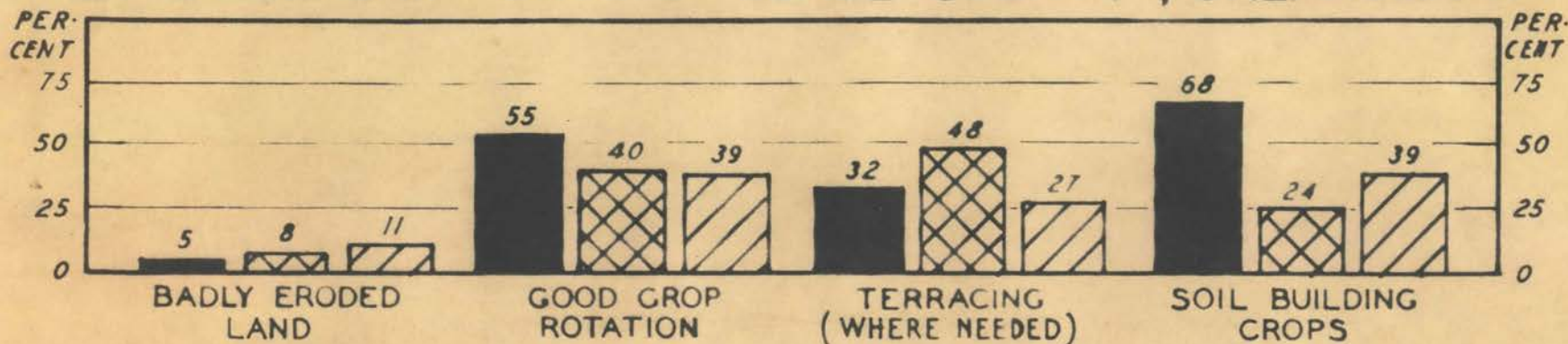
Table 11. Topography, Conditions of Erosion, and Effectiveness of Erosion Control Measures by Different Ownership Groups in Osage County, Oklahoma, March 1939

Ownership Group	Number Studied	Topography				Erosion Conditions				Effectiveness of Measures			
		Percent of Units Containing				Percent				Percent			
		Level	Rolling	Hilly	Very Hilly	Severe	Moderate	Slight	No Erosion	Excellent	Good	Fair	Poor
		Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Restricted Indians	40	65.7	90.0	10.0	-	5.0	47.5	27.5	20.0	11.8	20.6	41.2	26.5
Unrestricted Indians	37	48.6	89.2	35.1	2.7	8.1	62.2	27.0	2.7	-	25.7	54.3	20.0
White Farmers	38	55.3	84.2	10.5	2.6	10.5	36.8	31.6	21.0	13.3	10.0	36.7	40.0
Total	115	57.4	87.8	18.3	1.7	7.8	48.7	28.7	14.8	8.1	19.2	44.4	28.3

Source: From field survey conducted in March, 1939. See questionnaire, Appendix A.

— FIG. 8. —

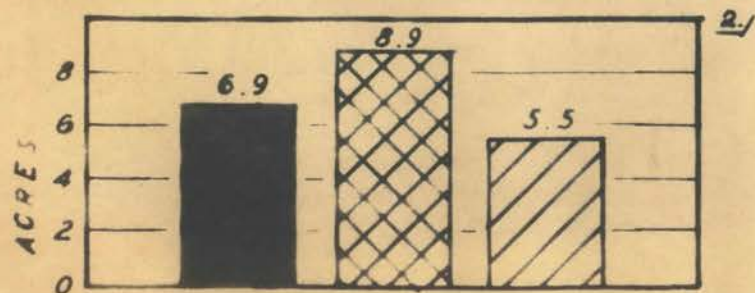
EROSION AND EROSION CONTROL MEASURES BY PERCENTAGES BY OWNERSHIP GROUPS : OSAGE COUNTY , OKLAHOMA ^{1./}



^{1./} SOURCE : SEE TABLE 11.

— FIG. 9. —

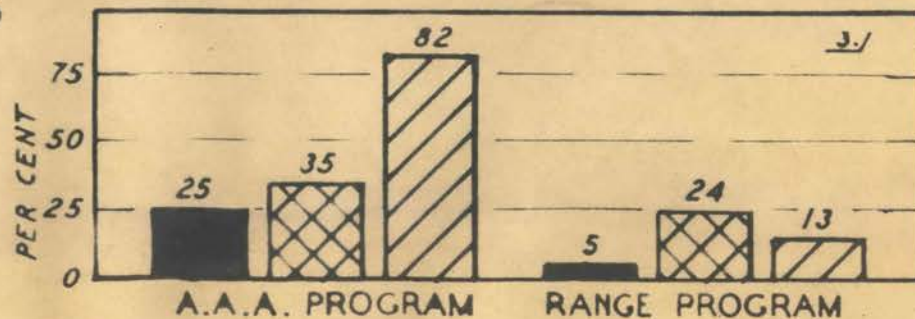
PASTURE ACREAGE PER ANIMAL UNIT GRAZED BY OWNERSHIP GROUPS



^{2./} SOURCE SEE 12

— FIG. 10. —

PERCENTAGE PARTICIPATING IN A.A.A. & RANGE PROGRAMS BY OWNERSHIP GROUPS



^{3./} SOURCE : SEE TABLE 4.

■ RESTRICTED INDIAN FARMERS ▨ UNRESTRICTED INDIAN FARMERS ▤ WHITE FARMERS

likely to wash or erode. ^{3/} The ratings of effectiveness as shown in Table 11, page 61, were based upon present effectiveness, as well as their likely effectiveness in the future. It was found that erosion control measures were not particularly needed on 15.0 percent of the restricted Indian operated farms, on 5.4 percent of the unrestricted Indian farms, and on 21.0 percent of the white operated farms. (See Table 12, page 64.) The units on which control measures were not needed are not included in the computations of the percentages that follow.

None of the unrestricted Indian operators were found to employ excellent control measures, but 11.8 percent of the restricted Indian operators, and 13.3 percent of the white operators employed excellent measures. However, 25.7 percent of the unrestricted Indians employed good erosion control measures in comparison to 20.6 percent among the restricted Indians, and 10.0 percent among the white operators. Measures adjudged to be fair were employed by 41.2 percent of the restricted Indians, 54.3 percent of the unrestricted Indians, and by 36.7 percent of the white operators. The white operators employed only poor erosion control measures on 40.0 percent of their units as compared to 20.0 percent among the unrestricted Indian group, and 26.5 percent among the restricted Indian operators.

^{3/} Soils and Men, Yearbook of Agriculture, 1938, "The amount of erosion by water is influenced by the texture, structure, and organic matter content of the soil. It may be modified by methods used in handling the soil and by the cropping practices employed." p. 419. "The porosity of a soil that was originally highly absorptive may have been seriously reduced as the result of depletion of organic matter and improper tillage. The addition of humus is essential to preserve or restore absorptive characteristics." pp. 653-654.

Table 12. Methods and Extent of Soil Conservation Practices by Ownership Groups
in Osage County, Oklahoma, March 1939

Ownership Groups	:Number:	Crop Rotation			:	Terracing and Strip Crops			:	Soil	:	Over-
	:Stud-	:Rotating:	Good	:Poor or No:	Not	:Terrac-	:Not Terrac-	:Planting:	Building:	grazing		
	ied	: Crops	:Rotation:	Rotation	:Needed	:ing	:ing Though	: Strip	: Crops	: Pasture		
	:	:Percent	: System	: Percent	:Percent:	:Percent:	: Needed	: Crops	:Percent	: Land		
	:	:	: Percent:	:	:	:	: Percent	:Percent	:	: Percent		
Restricted Indians	40	92.5	55.0	45.0	15.0	27.5	57.5	2.5	67.5	20.0		
Unrestricted Indians	37	81.1	40.5	59.5	5.4	45.9	48.6	-	24.3	29.7		
White Farmers	38	94.7	39.5	60.5	21.0	21.0	57.9	5.3	39.5	31.6		
Total	115	89.6	45.2	54.8	13.9	31.3	54.8	2.6	44.3	27.0		

Source: From field survey conducted in March, 1939. See questionnaire, Appendix A.

By the inspection of the data, it appears that the restricted Indian operators have accomplished most in soil conservation enterprises. The unrestricted Indian operators and the white farm operators are less effective in that order. By assigning an influence of 40 to the excellent ratings, 30 to the good ratings, 20 to the fair ratings, and 10 to the poor ratings; and multiplying by the percentages by groups falling within each classification, it is found that the ratings of accomplishments are as follows: restricted Indians, 21.8, unrestricted Indians, 20.6, and white operators, 17.7. These calculations are presented in Table 11A on the following page.

The effectiveness, from a physical point of view, of erosion control measures now employed is found to vary directly with land ownership, that is, the group operating the largest percent of their own land has the most effective erosion control measures and the group operating the largest percent of leased land employed the least effective control measures. This variation was found, also, to exist in regard to crop rotation, that is, the more effective the erosion control program the better the crop rotation. There is no consistent relationship between effectiveness of erosion control and topography, soil building crops, terracing, percentage in crops, nor conditions of erosion. From these facts, it appears that ownership in the land is the dominant factor influencing the effectiveness of a soil conservation program.

Insofar as variations in wealth and sources of income independent of the farms affect operations the groups practice efficient and economical methods of operation in the order: white farm operators, unrestricted Indian operators, and restricted Indian operators. Also, the white operators as a group are more concerned about immediate and certain

Table 11A. Ratings of Effectiveness of Erosion Control Measures by Ownership Groups

Ownership Groups	:Excellent : : 40	: Good : : 30	: Fair : : 20	: Poor : : 10	Totals
Restricted Indians	472	618	824	265	2,179
Unrestricted Indians	-	771	1,086	200	2,057
White Farmers	532	300	534	400	1,766

SOURCE: See Table 11. Basic figures from which calculations are made are taken from the percentages found in Table 11, page 47.

economic returns for their labor and capital involved than are the Indian groups. Immediate economic needs are diametrically opposed to good crop rotation, extensive use of machinery, and elaborate erosion control measures.

Farm Size and Type of Farming as Related to Erosion Control

In considering the problem of erosion and erosion control the data of all groups are consolidated and rearranged on the basis of the size of the units. (See Table 12A). The size of the units influence the crops grown, the percentage of land devoted to crops, number of cattle raised, and the equipment available; which factors in turn affect erosion and erosion control.

"When a farmer sets up his farming program, the size of his farm is a fixed factor, something he cannot change very well from year to year, certainly not within the year, something to which he definitely has to adjust his crop and livestock system. At the same time, he must make a living for himself and his family on his farm, whether he has 80 or 320 acres to handle. Similarly, his labor supply on the farm all the year round is a relatively fixed factor to which he has to adapt his farming program. Except for some outside labor hired for short rush periods, the labor is supplied chiefly by the farmer and his family, and his

farming program is aimed at keeping him busy all the year round as profitable as possible." 4/

Within the study area the least severe conditions of erosion were found to be on the smallest units. These units, less than 160 acres, were found also to contain the most level and most valuable land. A more self-sufficing system of farming is practiced on the smaller units. These factors tend to prevent serious erosion problems. It appears that the worst conditions of erosion (See Table 12A) are found on farms of 160 acres and on units of over 640 acres.

The percent of land in cultivation decreased from 54.4 percent for the units less than 160 acres to 48.0 percent for all units of 160 acres even. The acreages in crops increased from an average of 37 in the smaller farms to 76 in the 160 acre units. The number of beef cattle per farm did not increase with increase in size between these particular groups but the number of dairy cattle almost doubled. These facts indicate a tendency toward too much extension of the cropping system in 160 acre units in which suitable crop and sufficient pasture land is inadequate to support and employ economically a family by the use of the land to which it is best adapted. The severity of the erosion problem on the 160 acre farms is attributable largely to the misuse of the land in these units. The units falling within the group between 161 and 320 acres and containing an average of 274 acres are found to have a considerable less percentage of land in crops, a great deal more beef cattle and a far less serious erosion problem. The severity of erosion on the 160 acre farms is a reflection of the misuse of land in these units in an effort to adapt them to a family size operating

4/ Economic Phases of Erosion Control in Southern Iowa and Northern Missouri, Iowa State College of Agriculture, Ames, Bulletin No. 333.

Table 12A. Average Acreage, Percentages in Cultivation, Erosion, and Erosion Control by Size Groups in The Study Area, Osage County, Oklahoma, 1938-1939

Groups:	Average: Size of: Units :	Corn:	Wheat:	Oats:	All Crops:	Per- cent Crops:	Percent Owning: Trucks:	Hired Trac- tors :	Man Per: Unit :	Beef: Cat- tle :	Land Values: (Acres):	Erosion: Condi- tion 1/:	Control: Meas- ures 1/:	Percent: Tenants:	Num- ber Units
Less Than 160	73	5.8	12.1	5.7	37	54.4	33	25	.25	8.2	20.8	2.50	15.70	42	12
Even 160	160	8.4	26.8	12.1	76	48.0	35	26	.35	8.1	16.9	3.36	18.00	26	34
161- 320	274	12.5	37.2	27.4	109	39.8	53	68	.68	15.9	19.0	2.56	18.40	24	25
321- 640	502	13.2	54.5	35.5	157	31.6	75	67	1.20	28.3	18.2	2.82	15.50	17	24
Over 640	1,388	18.2	106.1	46.2	227	16.4	90	90	1.40	105.0	15.6	3.36	20.50	10	20
Total	461	17.2	47.1	25.6	122	26.7	57	55	.76	30.8	17.8	3.02	17.90	23	115

1/ Weighted. The larger the number the more severe the conditions of erosion and the more effective the erosion control measures.

units. The increase in the size of the 160 acre units would alleviate the problem of misuse of land and the severity of erosion. A corresponding decrease in the size of units over 640 acres would have the same effect.

The effectiveness of the erosion control measures used do not coincide closely with the severity of the conditions of erosion, nor with the value of the land. It appears that participation in the Agricultural Adjustment Administration Program, ownership in the land operated, kind of crops grown and other factors, rather than severity of erosion and sizes of units, influence the effectiveness of the erosion control program.

Tenure as Related to Erosion and Erosion Control

A tenant operator, in general, has no specific interest in keeping up soil fertility and the prevention of erosion as he is ready to move to another farm any time he sees fit. An owner-operator naturally has a very definite interest in soil conservation since his future economic welfare rests upon the perpetuation of his soil's productivity. Tenancy, although not an acute problem within the study area, is found to have a decided influence upon erosion and erosion control.

In analyzing the data on tenure and its relationship to land use, erosion and erosion control, observations of some significance upon the problems being considered are noted. In the first place, the most severe conditions of erosion are found on units operated by part-owners rather than by tenants. (See Table 12B). The average size of the units operated by part-owners is 1,212 acres and falls within the size group, (See Table 12A), having the most severe conditions of erosion. The tenants, operating units containing 255 acres on an average fall in a size classification having next to the least severe conditions of erosion. Beyond a certain limit the size of the unit operated has a greater bearing on erosion than does the attitude of the operator.

Table 12B. Average Acreage, Percentages in Cultivation, Erosion Control by Ownership Groups in The Study Area, Osage County, Oklahoma, 1938-1939

Groups	Num-ber	Average	Wheat	Oats	Meadow	All Crops	Per-centage	Per-centage	Percent	Dairy	Condi-tion	Erosion	Per-centage	Percent	Percent
	of	Size	Wheat	Oats	Meadow	All Crops	Per-centage	Per-centage	Parti-cipat-ing	Cat-tle	of Ero-sion	Meas-ures	Rota-ting	Terrac-ing	Planting
	Units								A.A.A.		1/	1/	Crops		Crops
Tenants	26	255	36.5	15.4	6.5	101	39.5	31	77	7.1	3.10	12.00	31	15	31
Part Owners	17	1,212	95.4	44.5	13.8	208	17.2	29	53	12.2	3.54	19.40	47	29	41
Owners	72	358	40.5	24.8	14.1	113	31.6	22	33	7.2	2.90	19.50	50	38	50
Total	115	461	47.1	25.6	11.9	122	26.7	25	46	7.4	3.02	17.90	45	31	43

1/ Weighted. The larger the number the more severe the conditions of erosion and the more effective the erosion control measures.

The tenant farmers, or lessees, crop 39.5 percent of their units as compared to 31.6 percent by the owners, and 17.2 percent by the part-owners. Tenant farmers, operating much smaller units than the owner-operators crop almost as much acreage, and support approximately the same number of livestock on about two-thirds as much pasture. This more intensive use of the land is reflected in the more serious conditions of erosion between the tenants and owner-operators. (See Table 12B). However, mitigating influences are found in the greater participation in the Agricultural Adjustment Administration Conservation Program by the tenants, control by the Agency of land use upon restricted Indian owned land and the practice of renewal of leases on government controlled Indian land.

The degree of ownership in the land is the deciding factor in effectiveness of erosion control measures as is shown by the fact that the tenants employ the least effective methods and the owner-operators the most effective. (See Table 12B). The practices of rotating crops and planting soil building crops also vary directly with ownership in the units operated. Promoting operator-ownership, where this can be done successfully, is the most effective way to aid in soil building and erosion control.

LAND UTILIZATION BY OWNERSHIP GROUPS, OSAGE COUNTY,
OKLAHOMA, MARCH 1939

The most acute and most important economic problems in the study area are maintaining soil fertility and preventing soil erosion. The principal factors to be kept in mind in the final analysis of the determinants affecting land use and soil conservation are: the differences in the characteristics of the groups--restricted Indians, unrestricted Indians, and white farm operators; the outside influences affecting these groups in different ways, and in different degrees-- the Indian Agency and the Agricultural Adjustment Administration conservation program; the different degrees of ownership exercised over the land by the operators, differences in capital available, and the variation of economic needs among the groups.

In developing the history of ownership in the land it is found that the Indians, original owners of the Osage Reservation, have disposed of approximately two-thirds of their land but they have retained for themselves the best land. The restricted Indians operating their own land are subject to a considerable degree of control by the Agency and all restricted Indian owned land is controlled to some extent by the Agency, regardless of who operates it. Most of the land leased by the unrestricted Indian and white operators in the units studied is owned by restricted Indians. The area under consideration has been under farm operation only a short time relatively speaking.

In considering land use, it is found that the unrestricted Indians utilize a larger percent of their land for pasture purposes. Acreage in pastures varies directly with ownership of livestock units, hilly land, and participation in the Range program. The restricted Indians planted

the greatest variety of crops and the unrestricted Indians the least. The diversified type of farming varies directly with the best topography, the acreage in crop land, the value of the land, and the planting of soil building crops. These relationships are interdependent but they are all dependent to a large extent upon the influence exercised through the Extension Service of the Osage Agency. Especially is this true where the restricted Indians are concerned. The fact that the white operators practice a more balanced type of farming, and plant more soil building crops than the unrestricted Indians can be attributed to control of the Agency over restricted Indian owned land leased to white operators and to the influence of the Agricultural Adjustment Administration crop control program. The unrestricted Indians lease less land than the white operators and are influenced less by the Agency and the Agricultural Adjustment Administration.

Good crop rotation systems are followed by restricted Indians, unrestricted Indians, and white operators in respective order. Good rotation varies directly with ownership in the land operated, value of homes and other improvements, but not consistently with severity of erosion. It seems that ownership in the land by the operator is the principal determinant in crop rotation. The Agricultural Adjustment Administration through benefit payments exercises some influence over the kinds of crops grown but apparently it has an adverse effect on crop rotation.

More beef cattle are owned by the unrestricted Indians than by either of the other two groups. The white operators and restricted Indians follow in the order mentioned. The ownership of beef cattle varies directly with acreages in pasture, very hilly topography, and participation in the Range program. The number of livestock units owned does not vary consis-

tently with conditions of erosion. The number of beef cattle owned by groups varies inversely with the value of the land, acreage devoted to wheat, oats, and alfalfa, level terrain, planting of soil building crops, and diversity in crops planted. This suggests that beef cattle are raised on the poorer grades of land and that cattle raising affects adversely the degree of diversity of crops on the land associated with the enterprise.

The planting of soil building crops and the practice of crop rotation serve to retain and maintain the fertility of the soil but the land must be free of erosion if either means is to serve its purpose most effectively. Such natural factors as topography and cover have a decided effect upon land erosion but the improper cultivation or overgrazing of land can hasten greatly the destruction of the soil by erosion. Severity of the conditions of erosion was found to vary directly with size of operating units with the exception that especially severe conditions of erosion were found to exist on the 160 acre farms. Serious erosion was found to exist in descending order on the farms of the white operators, the restricted Indian operators, and the unrestricted Indian operators. Severity of erosion does not vary with ownership in the land, value of land, topography, livestock units owned, economic needs of the operators, nor with the degree of influence wielded by the Indian Agency and the Agricultural Adjustment Administration program. The kinds of crops planted appear to be the deciding influence upon the extent of erosion found.

The most widely used means of controlling water erosion within the study area was found to be terracing. The unrestricted Indians terraced the most and the restricted Indians and white farm operators in the order indicated. The practice of terracing varies directly with the severity

of the conditions of erosion, the size of operating units, and the ownership of tractors. Terracing varies inversely to the acreage devoted to row crops and to the planting of strip crops for erosion control purposes. Terracing, varying directly with the severity of the conditions of erosion, indicates that the exigencies of the situation rather than outside influences affect the extent of terracing. The practice of planting row crops has had a deterrent effect on terracing. It is difficult to cultivate row crops on terraced land. Gully control has been practiced considerably in the pasture lands.

The effectiveness of present erosion control practices was found to be greatest among the restricted Indians, next among the unrestricted Indians, and least effective among the white operators. The indications are that the unrestricted Indians, operating the most hilly regions, and being outside the direct influence of the Agency, were so late in adopting erosion control measures that the erosion problem on their lands became serious and more effective methods were made necessary. Effectiveness of the program varies directly with land ownership, capital and machinery available, hired help, the growing of legumes, and crop rotation. The indications are that ownership in the land and availability of capital are the principal factors in influencing effective erosion control measures. The restricted Indians are practicing a self-sufficient agricultural economy largely and adhering to good crop rotation systems. The restricted Indians own a larger percent of land they operate than the other groups and they plant more soil building crops. This group leads the others in effectiveness of erosion control measures.

The unrestricted Indians, being outside the direct control and influence of the Agency and not participating in the Agricultural Adjust-

ment Administration program in large numbers, have been slower than either the restricted Indians or white operators in checking the ravages of erosion. They have tended more toward large scale livestock raising than the other groups. Although slower in adopting erosion control measures, as evidenced by the worst condition of erosion, the unrestricted Indians have tackled the erosion problem with measures in effectiveness second only to those of the restricted Indian group. The unrestricted Indians lead in terracing.

The white farm operators of the study area, leasing their operating units largely and with very limited capital, have developed a more diversified type of cropping, livestock, and poultry farming than found among the unrestricted Indians. Most of the land leased by the white operators is restricted Indian owned and subject to some degree of control by the Agency. They also participate in the Agricultural Adjustment Administration program in large numbers. The white farmers operate the smallest units, plant the most strip crops for conservation purposes and have not permitted their operating units to become so badly eroded as have the Indians. Having the least severe erosion problem, the white operators have not been compelled or inclined to adopt so effective control measures as have the Indian groups.

The problem of correct cropping practices from a soil building and soil conserving point of view is not acute. Some soil conserving and soil building practices among the Indian groups, in individual cases, have been uneconomical. However, economic considerations have directed the use of the hilly lands to native grass pastures and only the more level land to crops. Economic needs or economic methods of operations do not vary consistently with topography of the land, acreage devoted to principal crops, erosion conditions, nor value of land. Economic needs and methods

do vary directly with the number of dairy cattle owned, number of hogs owned, overgrazing and participation in the Agricultural Adjustment Administration program, and inversely to value of homes and other improvements, ownership of machinery, crop rotation and effectiveness of erosion control measures.

Extension of white operations would not affect land use materially neither would it result in more economic operations as determined by acreages per tractor and per work animals.

A cost account system should be inaugurated among a fair sample of white and Indian farm operators to determine accurately the expenditures of oil incomes on the Indians' farms and the profits derived from their units. This study should be made comparatively between Indian and white operators and should be devised to determine the costs of training and educating the Osage Indians in practical agriculture.

Tenants, or lessees, utilize the land more intensively than the owners. This results in severe conditions of erosion and their lack of interest in the soil makes this group the poorest in effectiveness of soil building practices and in soil conservation. An extension of owner-operatorship or more aid by the government or the landowner is needed to offset the lack of incentive of the tenants in soil conservation.

Under the present system of government control of tenant operated restricted Indian owned land through approval of leases, the adverse affects of tenancy on soil erosion and soil conservation is mitigated to some extent. However, tenancy affects adversely the severity of conditions of erosion but other factors are important.

Adjustments in the size of operating units upward from the 160 acre units and downward from the units over 640 acres would result in more correct land use, a better crop and livestock balance and permit more effective erosion control measures.

Once the adjustments in size of units is made, the remaining deciding factor in correct land use and effective erosion control is ownership in the land by the operators.

APPENDIX A

QUESTIONNAIRE

80.

THE OSAGE INDIAN AGENCY
THE DEPARTMENT OF INTERIOR
PAWNEE, OKLAHOMA

March 1, 1939

Name _____ Twp. _____ Range _____ Section _____

Restricted Indian _____ Owned _____ Leased _____.

Non-restricted Indian _____ Owned _____ Leased _____.

White _____ Owned _____ Leased _____.

Number of acres owned _____, leased _____, Age of owner or operator _____.

Acres in crops 1938: Corn _____ Wheat _____ Oats _____ Alfalfa _____ Other hay _____

Cotton _____ Other crops _____ Pasture _____ Woodland _____ Other _____.

Topography: Level _____ Rolling _____ Hilly _____ Very hilly _____.

Condition of land from erosion viewpoint: Badly eroded _____ Eroded some _____

A little erosion apparent _____ Not eroded _____, Present erosion control measures:

Excellent _____ Good _____ Fair _____ Poor _____, Is crop rotation being practiced: Yes _____

No _____: Good _____ Poor _____, Is terracing being practiced: Yes _____ No _____: Strip

crops: Yes _____ No _____; Soil conserving crops: Yes _____ No _____.

Condition of homes: Excellent _____ Good _____ Fair _____ Poor _____, Condition of other

improvements: Excellent _____ Good _____ Fair _____ Poor _____.

Number and kind of livestock and poultry: Horses _____ Mules _____ Cattle _____

Sheep _____ Hogs _____ Others _____; Chickens _____ Geese _____ Turkeys _____ Guineaas _____

Ducks _____.

Automobiles and machinery: Auto, Yes _____ No _____; Tractor, Yes _____ No _____; Cultivator,

Yes _____ No _____; Modern hay equipment, Yes _____ No _____; Other machinery (kind) _____.

Is grazing lands being over-grazed: Yes _____ No _____.

Apparent value of land \$ _____ per acre; Home \$ _____; Other improvements

\$ _____.

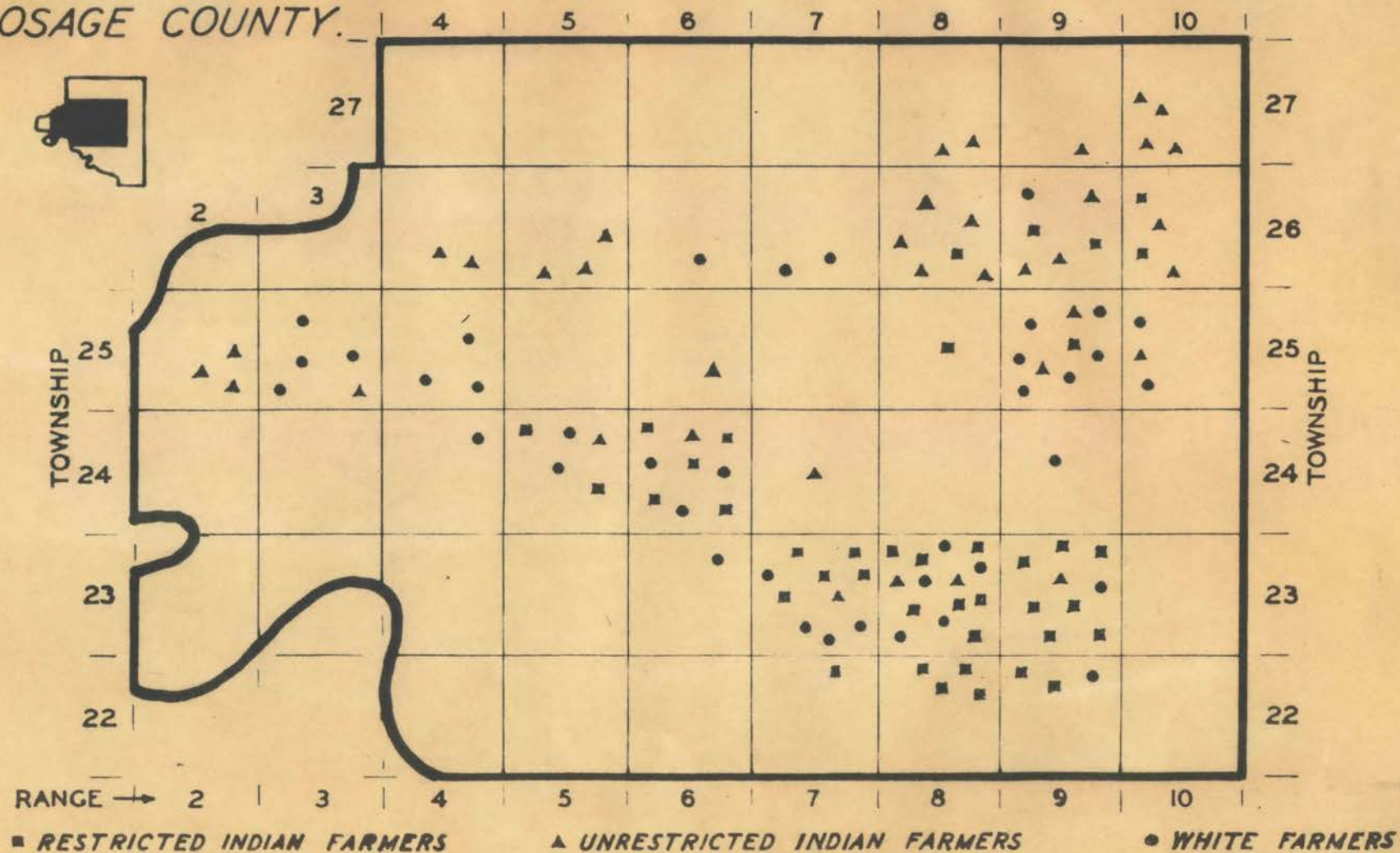
Participation in AAA control program: Yes _____ No _____, Conservation program: Yes _____

No _____.

Remarks:

— FIG. 11.—

DISTRIBUTION OF DIFFERENT OWNERSHIP GROUPS STUDIED IN OSAGE COUNTY.



APPENDIX B

Table 13. Consolidated Table of Data Gathered in Field Survey
Osage County, March 1939

	Restricted: Un- : Indian : Operators	Restricted: Operators : Indian : Operators	White : Operators	Totals
Number of units studied	40	37	38	115
Number of owner-operators	37	24	11	72
Number part owner-operators	3	11	3	17
Number lessees	-	2	24	26
Average age of operators	38.5	41.8	41.6	-
Total acres owned	11,249	15,705	4,090	31,044
Total acres leased	2,030	11,908	8,040	21,975
Average acreage per operating unit	332	746	319	-
Total acres: Corn	426	436	508	1,370
Wheat	1,743	2,460	1,295	5,498
Alfalfa	329	181	148	658
Other hay	438	506	659	1,601
Cotton	20	-	85	105
Hay meadow	287	925	210	1,422
Barley	209	239	298	746
Pasture	8,663	21,697	8,332	38,692
Oats	1,166	1,166	607	2,939
Total number containing level land	27	18	21	66
Rolling	36	33	32	101
Hilly	4	13	4	21
Very hilly	-	1	1	2
Number units: Badly eroded	2	3	4	9
Eroded some	19	23	14	56
A little erosion apparent	11	10	12	33
Not eroded	8	1	8	17
Erosion control measures: Excellent	4	-	4	8
Good	7	9	3	19
Fair	14	19	11	44
Poor	9	7	12	28
Not needed	6	2	8	16
Number rotating crops	37	30	36	103
Number not rotating crops	3	7	2	12
Number employing good rotation	22	15	15	52
Number employing poor rotation	15	15	21	51
Total number practicing terracing	11	17	8	36
Number not practicing terracing	29	20	30	79
Number units on which terracing not needed	6	2	8	16
Units planted to strip crops	1	-	2	3
Units not planted to strip crops	39	37	36	112
Operators planting soil building crops	27	9	15	51
Operators not planting soil build- ing crops	13	28	23	64

(Continued)

Table 13. (Continued)

	Restricted:Un- : Indian : Operators : :	White restricted:Operators Indian : Operators :	Totals :	
Condition of homes: Excellent	26	8	4	38
Good	12	22	18	52
Fair	1	7	16	24
Poor	1	-	-	1
Condition of other improvements:				
Excellent	23	8	3	32
Good	11	22	13	46
Fair	5	8	21	34
Poor	1	1	1	3
Total number: Horses	262	176	167	605
Mules	41	55	44	140
Beef cattle	781	1,843	920	3,544
Dairy cattle	157	316	375	848
Sheep	19	227	97	343
Hogs	334	450	538	1,322
Goats	2	75	7	84
Chickens	3,469	4,040	3,860	11,369
Geese	141	64	14	219
Turkeys	476	512	141	1,129
Guineas	127	91	206	424
Ducks	86	49	6	141
Total number owning: Autos	39	37	38	114
Trucks	29	23	14	66
Tractors	23	22	19	64
Cultivators	34	36	36	106
Modern hay equipment	17	12	4	33
Other machinery	22	18	16	56
Total units overgrazed	8	11	10	29
Units not overgrazed	32	26	28	86
Average value of land per acre	\$19.25	\$16.78	\$16.89	-
Total value of homes	171,380	89,400	59,190	319,970
Total value of other improve- ments	73,900	41,850	27,000	142,750
Number participating in Agri- cultural Adjustment Adminis- tration program	10	12	31	53
Number participating in Range program	2	9	5	16
Total number hiring help	33	26	11	70
Total number of hired help	33	33	19	90

APPENDIX C

STRATHMORE PARCHMENT

100% RAG U.S.A.

Table 14. Number of Farms, Land in Farms, Tenure, Value of Farms, Principal Crops, Livestock and Poultry by Selected Townships, Osage County, Oklahoma, 1935

Townships	: Num- ber : Farms :	: Acres in : Farms :	:Average: :Acreage: : Per : Farm	: Acres in : Cropland :	:Percent-: :age in : Crop- : land	: Acres in : Pasture :	: Per- centage : in : Pasture	: Acres : Farm : Land : Rented	: Percent-: age Farm : Land : Rented	: Total Number of Operators
Big Hill	452	165,038	365	41,566	25.2	117,292	71.1	115,664	70.1	452
Fairfax	179	83,795	468	13,622	16.3	68,613	81.9	68,360	81.6	179
Hominy	306	163,851	535	19,063	11.6	140,940	86.0	112,733	68.8	305
Strike Axe	542	206,927	382	23,578	11.4	180,384	87.2	128,673	62.2	542
Total	1,479	619,611	419	97,829	15.8	507,229	81.9	425,430	68.7	1,478
County Total	2,644	1,165,408	441	170,510	14.6	968,887	83.1	715,161	61.4	2,664
Field Survey All <u>1</u> / ₂			461		27.0		73.0		41.4	
Field Survey Whites <u>1</u> / ₂			319		31.3		68.7		66.3	

(Continued)

Table 14. (Continued)

Townships	Number : Owners	Percent- : Owners	Number : Owners	Percent- : Owners	All : Tenants	Percent- : Tenants	Average : Farm	Average : Acre	Acre : 1934	Percent- : Wheat	Acres : 1934	Percent- : Oats
Big Hill	102	22.6	28	6.2	322	71.2	\$7,076	19	3,537	2.1	4,265	2.6
Fairfax	17	9.5	-	-	162	90.5	5,679	12	240	.29	1,363	1.6
Hominy	57	18.7	7	2.3	241	79.0	6,974	13	83	.05	2,640	1.6
Strike Axe	197	36.3	31	5.7	314	57.9	5,625	15	486	.23	3,033	1.5
Total	373	25.2	66	4.5	1,039	70.3	6,354	15	4,383	.71	11,301	1.8
County Total	680	25.7	130	4.9	1,834	69.4	6,211	14	7,155	.61	19,174	1.6
Field Survey All <u>1</u> / <u>2</u>		62.6		15.6		21.7		18		10.4		5.5
Field Survey Whites <u>1</u> / <u>2</u>		28.9		7.9		63.2		17		10.7		5.0

(Continued)

Table 14. (Continued)

Townships	: Acres: : in	: Percent: : Acreage:	: Number : Horses	: Average Num- : ber Horses	: Total : Number	: Average : : Number	: Number : : Chickens:	: Average: : Number	: Number : : Hogs	: Average : Number
	: Barley: : 1934	: in	: and	: and Mules	: of	: Cattle :	: Chickens:		: Hogs	
	: 1934	: Barley	: Mules	: Per Farm	: Cattle	: Per Farm:	: Per Farm:		: Per Farm:	: Per Farm
Big Hill	129	.08	2,211	4.9	17,588	38.9	22,378	49.5	3,072	6.8
Fairfax	-	-	871	4.9	11,404	63.7	8,447	47.2	1,243	6.9
Hominy	20	.01	1,405	4.6	16,319	53.3	13,385	43.7	1,921	6.3
Strike Axe	20	.01	2,037	3.8	21,045	38.8	19,618	36.2	2,610	4.8
Total	169	.03	6,524	4.4	66,356	44.9	63,828	43.2	8,846	6.0
County Total	541	.05	11,219	4.2	107,761	40.8	113,135	42.8	15,365	5.8
Field Survey All <u>1</u> / ₂		1.4		6.5		38.2		98.9		11.5
Field Survey Whites <u>1</u> / ₂		2.4		5.6		34.1		101.6		14.2

Source: Federal Farm Census, 1935, (As of January 1, 1935). Tables I, II, and III, Sheet No. 25, Osage County, Oklahoma.

Note: Field survey conducted in March, 1939. See Questionnaire, Appendix A.

1/ Field survey included 115 operating units; 38 of which were operated by white farmers.

APPENDIX D

THE ANNUAL REPORT OF EXTENSION WORKERS FROM
JANUARY 1, 1938 TO DECEMBER 31, 1938
OSAGE INDIAN RESERVATION,
PAWNEE, OKLAHOMA

(Extract)

Program of work:

- (a) Factors considered and methods used in determining program of work.

The principal factor considered in determining this program of work was the advancement of the well being of the Osage Indian farmer, together with a desire to increase his interest in farming and stock raising, both as to methods and results. The methods used in determining these projects consisted almost exclusively of discussions between extension workers and leading Indian farmers throughout the jurisdiction as to the most important factors to be considered.

- (b) Project goals and results.

The program of work consists of six projects which cover fairly well most of the activities of the average Osage farmer, and it is gratifying to observe that many of them, especially the younger ones, are showing considerable interest in the work. The six projects follow:

I Home Garden and Poultry:- The goals set up under this project:

- (a) To have each Indian farm family produce a good garden;
- (b) To can a bountiful supply of vegetables for the entire year and to dry or store other vegetables for winter use;
- (c) To raise a variety of poultry;
- (d) To produce poultry products sufficient for family use and a surplus for market;
- (e) To have each Indian farm family raise at least fifty hens, fifty turkeys and a few geese, ducks and guineas each year.

The goals reached under this project are as follows:

- (a) Each farm family and some others produced gardens, most of which were average;
- (b) Nearly all farmers canned a good supply of vegetables, some also stored, and some, especially corn, was dried and stored for winter use;
- (c) A satisfactory variety of poultry has been raised--nearly all farmers participated to some extent;
- (d) A sufficient amount of poultry and poultry products was produced for home use and a considerable amount was sold in poultry and poultry products to the value of \$5,320.00, and products to the value of \$12,183.00 were consumed.
- (e) It is believed that nearly all farmers have raised and kept fifty hens, some turkeys, a few ducks, geese and guineas.

II Diversified Farming:- Goals set up under this project are as follows:

- (a) To establish a well balanced crop system on each farm;
- (b) To increase crop yields by proper rotation of crops;
- (c) To have a larger amount of good seed selected and stored on each farm;
- (d) To increase the interest of Indians in farm activities;
- (e) To secure a more profitable operation of farms.

The goals reached under this project are as follows:

- (a) A good cropping system has been established with, at least 75 percent Indian farmers, and with a large percent of all lessees;
- (b) Owing to rust and excessive rain preceding harvesting of small grains the yields were much smaller, however, corn and grain sorghum crops were improved by cropping system;
- (c) A fairly large amount of seed of good quality was stored on many farms--probably 35 percent;
- (d) The interest of Indians, in general, have been increased in farming activities;
- (e) More profitable operation of farms has resulted owing to better management in a large number of instances, probably 40 percent.

III Stock Raising:- The goals set up under this are:

- (a) To balance better the number of livestock on each farm; (during each succeeding year)
- (b) To raise a sufficient number of animals to provide an abundance of meat, dairy products and work animals;
- (c) To establish a few small herds of pure bred stock for breeding purposes;
- (d) To make each year's operations more profitable than the past year;
- (e) To create a growing interest in animal husbandry.

The goals obtained under this project are as follows:

- (a) The balance in number of livestock kept and their quality has steadily improved, and 15 Osage Indians received premiums on livestock at the Osage County Fair in competition with white people of Osage and adjoining counties;
- (b) Approximately 75 percent of stockmen produced an ample amount of beef for meat with a surplus for sale. Dairy products produced were ample for all needs;
- (c) At least three small herds of pure bred hereford cattle have been established with some outstanding individuals;
- (d) This year's operation has been profitable and the interest in animal husbandry has increased.

One hundred and fifty Osage Indian farmers have beef cattle, 154 dairy cattle, 18 have sheep, 72 have hogs, 200 have horses and mules and 231 have poultry. This indicates a much better balance in the kind of stock kept by Indian farmers. The quality of this stock is much better than that of the average white stock man of Osage County.

IV Range Management:- The goals set up on this project are:

- (a) To increase the acreage allowed each animal grazed;
- (b) To plant some grass seed and Bermuda roots each year;
- (c) To encourage stockmen to permit reseeding of grass each year;
- (d) To construct some erosion control dams each year;
- (e) To construct empounding dams for stock water each year.

The goals reached during the present year are as follows:

- (a) The acreage allowed on the range for each animal grazed has been increased in all instances from four to five acres and in many instances to six and even eight acres;
- (b) Some grass seed and Bermuda roots have been planted in various parts of the range by the CCC-ID;
- (c) Stockmen have been encouraged in permitting the reseeding of grass and the results have been very favorable. The burning of dead grass on the range has nearly ceased;
- (d) The number of erosion control dams completed during 1938 by the CCC-ID is 1889;
- (e) The number of empounding dams for stock water completed during 1938, also by the CCC-ID force, totaled 19.

V Irrigation:- (not quoted--relatively unimportant from the point of view of this study).

VI Soil Conservation and Restoration of Soil Fertility:- Goals set up:

- (a) To increase the interest of Indian land owners in soil conservation and restoration of soil fertility;
- (b) To induce occupants of Indian owned land to practice contour and strip farming;
- (c) To interest each Indian farmer in terracing his farm lands where needed;
- (d) To increase the growing of legumes each year and to increase the use of farmyard manure and commercial fertilizers.

The goals reached were satisfactory on this project:

- (a) Indian land owners in general are greatly interested in the conservation of soil and restoration of soil fertility. The
- (b) number of occupants of Indian owned land who practice contour and strip farming is increasing at a satisfactory rate;

- (c) Indians are showing a lively interest in getting their lands terraced. During the past year they have terraced 16 farms at their own expense--the CCC-ID building outlets and running terrace lines;
- (d) The growing of legumes has increased each of the past several years, consisting principally of cow peas, soy beans, sweet clover, lespadeza and alfalfa. The use of barnyard manure increased to a considerable extent and commercial fertilizers to some extent.

Farming and Grazing Lease Agreement ^{1/}

As the type of lease used and the provisions of the lease agreement have a definite bearing on land use, some of the more important provisions of the Farming and Grazing Leases now being used are quoted:

"Lands of adults may be leased for terms not exceeding five years for farming purposes and not exceeding three years for grazing purposes, except in cases where leases are made in favor of the oil and gas lessees of the lands, where they may be made for the time the title to the minerals remain in the Osage tribe, with provision that the rental shall be adjusted every two years from the date of approval of such lease. Lands of minors may be leased for the same terms except that in no case shall the lease covering lands of a minor extend beyond the minority. The ages of the minors shall be stated in the lease."

"The lessee further agrees to keep said premises in good repair; to work and farm said land in a good and husband-like manner; to commit no waste thereon; and to take necessary steps to prevent said land from washing and ditches and gulleys from forming; to keep said lands free from noxious weeds; to not alter said premises except as may be herein provided; to at all times plow and tend said land to the best advantage of the lessor and the lessee; and turn over said premises to the lessor at the expiration of this lease peaceably and without legal process for the recovery thereof, and in as good condition as they now are, the usual wear and inevitable accidents excepted."

"That the lands herein provided for are set aside for the sole use and benefit of the individual members of the tribe entitled thereto, or to their heirs, as herein provided; and said members or their heirs, shall have the right to use and to lease said land for farming, grazing, or any other purpose not otherwise specifically provided for herein, and said members shall have full control of the same, including the proceeds thereof; PROVIDED, that parents of minor members of the tribe shall have the control and use of said minors' lands, together with the proceeds of the same until said minors arrive at their majority; AND PROVIDED FURTHER, that all leases given on said lands for the benefit of the individual members of the tribe entitled thereto, or for their heirs, shall be subject only to the approval of the Secretary of the Interior."

"All farming operations conducted under this lease shall be done in accordance with approved methods. Where land is terraced or where contour lines have been established all cultivation shall

^{1/} Farming and Grazing Leases, Osage Reservation, Oklahoma.

be parallel with such terraces or contour lines.--and lessee shall keep all terraces in good repair. It has been fully established that the burning of grazing lands is injurious, as it destroys vegetable mould, increases the rapidity of run-off water, and therefore increases erosion. The burning of grazing lands is, therefore, forbidden under the terms of this lease. Failure on the part of any lessee to comply with the above terms of lease shall be considered a damage to the property, the amount of such damage to be determined by the Superintendent, and the lessee and his bondsmen will be held responsible for such damage, and the lease rendered subject to cancellation at the option of the Superintendent of the Osage Agency."

"Said lessee further agrees where the land is to be used for grazing purposes to graze not to exceed ONE HEAD OF GROWN STOCK TO EACH FIVE ACRES EACH YEAR and both before and after the introduction of any cattle on this land to comply with each and every provision, law and regulation now in force or hereafter to be promulgated by the United States Bureau of Animal Industry and the State Board of Agriculture of the State of Oklahoma as may be applicable where the lands herein described are situated, and before introducing any cattle to furnish the Superintendent of the Osage Agency with a certificate signed by an officer of said Federal Bureau and State Board, showing that their requirements have been fully complied with." Approved: 8-19-36, Oscar L. Chapman, Assistant Secretary of the Interior.

The provisions of this lease apply only to the restricted Indian land that is leased for agricultural purposes.

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and
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