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8-1-1954

# Population Trends in Relation to Resources Development in South Dakota

J. P. Johansen

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# Population Trends

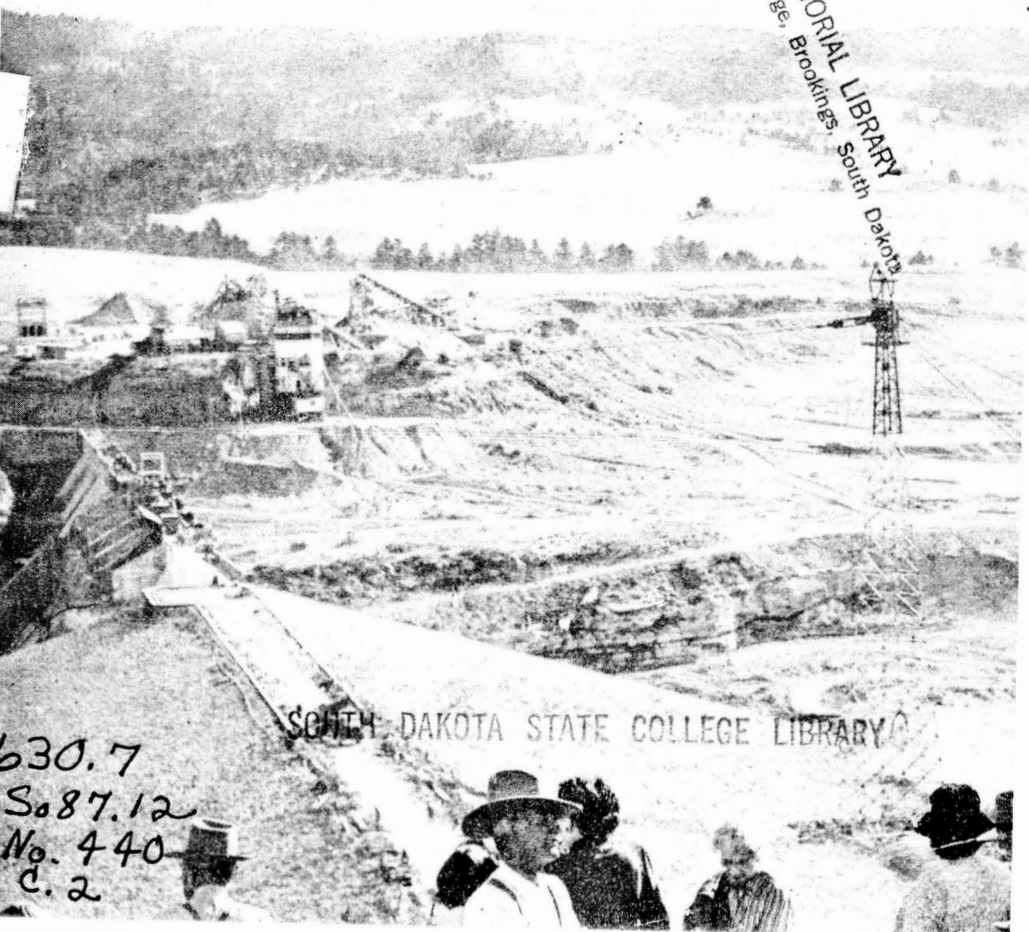
## n Relation to Resources Development

### N SOUTH DAKOTA

URAL SOCIOLOGY DEPARTMENT  
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OUTH DAKOTA STATE COLLEGE, BROOKINGS

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This report is based on a state project contributing to the North Central regional project on population dynamics, NC-18.

# Population Trends

## In Relation to Resources Development IN SOUTH DAKOTA

by JOHN P. JOHANSEN<sup>1</sup>

### South Dakota's Future Population Prospects

SOUTH DAKOTA's population is likely to increase to a considerable extent in the future on account of resources development. Several great water resources projects located on the Missouri River and its tributaries are under construction or being planned for multiple purposes, such as flood control, irrigation, hydro-electric power, municipal water supplies, and recreational areas. As these projects reach completion and are geared into the economy of the state, they should have several direct and indirect influences upon the state's population. But before these developments can be realized, it seems probable that the state will have a smaller proportion of the Nation's population than it has had in the past. A considerable decrease in this proportion occurred, as shown in Table 1, from 1930 to 1950. Several of the northwest central states have experienced a similar trend. The number of their inhabitants has not increased nearly as fast as the Nation's. The population of Iowa, for example, accounted for 3.2 percent of the Nation's population in 1880, but it had only 1.7 percent of the Nation's in 1950. Yet in these 70 years, Iowa's population increased from 1,624,615 to 2,621,073.<sup>2</sup>

Estimates of the state's future population were made recently by population experts and used by ad-

ministrative authorities in the formulation of plans for the Missouri Basin. These projections of the state's future population involve a low, a medium, and a high estimate. By 1975, the low estimate points to a population of 588,000, a medium estimate of 675,000, and a high estimate of 800,000. A related set of estimates was also made for the total population of the United States. Each of the three estimates portends that South Dakota will have smaller proportion of the Nation's population than it had in 1950.

<sup>1</sup>Research Associate in Rural Sociology, South Dakota State College Agricultural Experiment Station. This study is part of a more comprehensive research project made possible through a cooperative agreement between the South Dakota State College of Agriculture and Mechanic Arts and the Bureau of Reclamation, U. S. Department of the Interior.

<sup>2</sup>Iowa Agricultural Experiment Station, Ames, Iowa, *Iowa Farm Science*, Vol. VII, p 13. See also 1950 *United States Census of Population, U. S. Summary, Number of Inhabitants*, Table 3, p. 1-11.



Table 1. Population Census of 1930 and 1950 and Population Estimates for 1975 in the United States and in South Dakota

	Population Census		Population Estimates 1975*		
	1930	1950	Low	Medium	High
United States	122,775,046	150,697,361	165,616,000	190,101,000	225,310,000
South Dakota	692,849	652,740	588,000	675,000	800,000

\*Sources: Margaret J. Hagood and Jacob S. Siegel, "Projection of Regional Distribution of Population," *Agricultural Economics Research*, Vol. III, No. 2, pp. 41-52. (April 1951). Charles E. Brokaw, Regional Director U. S. Department of Commerce, Denver, Colorado, "Population Forecasts for the Missouri Basin States," Appendix G and Appendix B in *Minutes of the Fifty-Fourth Meeting of the Missouri Basin Inter-Agency Committee*, (January 24, 1952).

The estimates made in Table 1 involve assumptions to the effect that according to the high estimate of population in 1975, the United States population would increase above the census of 1950 by 49.4 percent while South Dakota's population would increase only 22.6 percent over its 1950 census.

Which one of these estimates, if any of them, will turn out to be correct? In the light of present conditions in South Dakota, both the low and the medium estimates appear to under-estimate the potential population growth of the state. The high estimate of 800,000 by 1975 may turn out to be more nearly correct. Past population trends of the state point both upward and downward—rapidly upward from 1880 to 1930; downward from 1930 to 1950. During the past 10 years, the state experienced both a large net out-migration during the war years (1940-1945) and a net return migration during the last 5 years (1945-1950). Although the state had nearly the same population in 1940 and in 1950, it did have a net out-migration of nearly 80,000 persons.

Estimates of South Dakota's future population must take several factors into consideration. These factors may be classified briefly as

climatic, political, economic, and technological.

The climatic factor, which includes conditions of temperature, precipitation, length of the growing season, killing frosts, and seasons of drought or seasons of normal rainfall has exerted an important influence on the population of the state. Political events and conditions, extending far beyond the border of the state, have resulted in two World Wars and the more recent conflict in Korea. Economic fluctuations in the form of inflation and deflation have accompanied each major change from peace to war and from war to peace.

The changing agricultural technology, the use of tractors, motor trucks, combines, and many other mechanical facilities, has greatly influenced the population shift from farms to cities. The changes in transportation, travel, and communication have had the effect of shrinking the world in which we live. In a relatively short time the automobile, electricity, radio, radar, television, aircraft, and atomic energy have greatly transformed human society. In the future, social changes will continue to come to South Dakota. The effects of the great dams now under construction

along the Missouri River will help bring about some of these changes.

In the perspective of time one may observe fairly definite influences exerted by these factors on the state's population. Nevertheless, their future occurrence and consequences are uncertain and unpredictable. In the past the people have sought to adjust themselves and their institutions to climatic conditions and economic emergencies.

Population trends as such involve many elements of regularity and predictability. The same is true about many aspects of vital statistics, such as births, deaths, marriages, and other events. We may speak of a population trend when a given population change continues to occur in a stated direction; as for example, the birth rate is increasing, the death rate is practically constant, the farm population is de-

creasing, and the urban population is increasing. It is primarily on the basis of past population trends that one may venture to make an estimate as to what the state's future population may be.

One estimate which involves a large "if" and several unknown factors may be stated as follows:

South Dakota has at present a comparatively high rate of natural increase. The annual excess of births over deaths is large. The resources in the state have been subject to great fluctuation and instability. Migration from the state has occurred in response to inadequate resources and lack of employment opportunities. If the resources can be developed so as to provide more employment opportunities primarily for the oncoming generations, South Dakota can look forward to a larger future population.

## **General Aspects of Population Adjustment to Resources in South Dakota, 1930-1950**

### **Geographic and Climatic Conditions in South Dakota**

**S**OUTH DAKOTA is a part of the Northern Great Plains. The Plains extend eastward from the foothills of the Rocky Mountains and merge gradually into the adjoining prairie regions. They are a broad slope of lands whose elevation ranges from well above 5,000 feet at their western limits to 2,000 feet or less at the approximate eastern border. The Great Plains are high, wide, windswept grasslands, ocean-like in their appearance and extent. In some localities they exhibit a broad, level plain; in others a rolling and dissected topography with buttes, badlands, "breaks," and the deeply cut trenches of the rivers and their tributaries.

Western South Dakota includes the mountainous area of the Black

Hills. The geology and the climatic conditions of this area vary distinctly from the rest of the state. The Black Hills, for example, have a much higher annual precipitation



The unpredictable yet certain recurrence of drought has become the chief factor limiting the development of the land and the population of the Great Plains.<sup>3</sup>

In central South Dakota, as shown in Table 2, several dry years with less than normal precipitation occurred during the 1890's. Another sequence of dry years came from 1910 to 1913; but the next 3 years,

Table 2. Average Annual Precipitation in Central South Dakota from 1890 to 1950

Precipitation			Departure from Average, 1890-1950		
Year	Average Precipitation*	Amount	Year	Average Precipitation	Departure from Average, 1890-1950
1890	13.15	-4.14	1920	22.01	4.72
1891	13.69	-3.60	1921	19.32	2.03
1892	20.56	3.27	1922	19.56	2.27
1893	17.22	-0.07	1923	19.79	2.50
1894	12.63	-4.66	1924	17.54	0.25
1895	13.12	-4.17	1925	14.32	-2.97
1896	18.88	1.59	1926	14.10	-3.19
1897	17.03	-0.26	1927	21.68	4.39
1898	11.00	-6.29	1928	15.50	-1.79
1899	16.85	-0.44	1929	17.65	0.36
1900	18.58	1.29	1930	17.75	0.46
1901	19.50	2.21	1931	14.25	-3.04
1902	17.27	-0.02	1932	18.34	1.05
1903	17.67	0.38	1933	12.68	-4.61
1904	13.81	-3.48	1934	9.71	-7.58
1905	21.83	4.54	1935	15.25	-2.04
1906	23.84	6.55	1936	8.98	-8.31
1907	16.67	-0.62	1927	15.21	-2.08
1908	21.11	3.82	1938	16.31	-0.98
1909	18.02	0.73	1939	15.26	-2.03
1910	13.23	-4.06	1940	12.72	-4.57
1911	16.91	-0.38	1941	20.07	2.78
1912	14.64	-2.65	1942	23.10	5.81
1913	15.33	-1.96	1943	16.02	-1.27
1914	20.69	3.40	1944	23.04	5.75
1915	28.86	11.57	1945	15.88	-1.41
1916	21.06	3.77	1946	23.01	5.72
1917	15.17	-2.12	1947	15.53	-1.76
1918	18.95	1.66	1948	18.49	1.20
1919	19.14	1.85	1949	17.86	0.57
			1950	17.64	0.35
1890-1950, average precipitation				17.29	

especially 1915, had rainfall much above normal. In the same table, it may also be observed that most of the years from 1931 through 1940, with the exception of 1932, were years of drought and subnormal precipitation. The 1940's, on the whole, had above-normal rainfall.

An intensive study of climatic conditions in Hand County, South Dakota and its influence upon agriculture from 1862 through 1939 has been made by D. C. Myrick.<sup>4</sup> Hand County lies in the central part of South Dakota on the eastern border of the Great Plains. Myrick describes the climate in Hand County as one characterized by extreme variability and points out that precipitation is the principal limiting factor in its agriculture. Other factors, such as the hot summers, the severe winters, the scarce water supply, and grasshopper infestations also influence crops.

The data were obtained from Weather Bureau records, from the files of local newspapers, and other sources. He describes the drought years from 1930 through 1939 in considerable detail. The 78 seasons from 1862 to 1940 were classified into three categories; good years, fair years, and poor years. Forty percent, or 31 of the 78 years, were good years which produced crops that satisfied farmers generally. Thirty percent, or 23 years, pro-

<sup>3</sup>C. Goodrich and others, *Migration and Economic Opportunity* (1936) p. 202.

<sup>4</sup>Delbert C. Myrick, *Climate: The Limiting Factor in Hand County Agriculture*, mimeograph pub., Farm Management Report, No. 25, June, 1941. U. S. Department of Agriculture, Bureau of Agricultural Economics in Cooperation with South Dakota Agricultural Experiment Station.

\*Basic data were obtained from a tabulation entitled "Comparative Annual Data for South Dakota," 1890-1951, for the Middle Division of the State, furnished through the courtesy of U. S. Department of Commerce, Weather Bureau, Huron, S. D.

duced crop yields that were fair though somewhat disappointing, but which did not cause hardship. The remaining 30 percent, or 24 years, resulted in crops that were poor and approached total failure. These crop failures resulted in general hardship and privation. The lowest yields occurred in 1934, the corn crop then being nearly a complete failure.

### **Social and Economic Maladjustments in the Great Plains**

Western and central South Dakota, as well as the larger region of the Northern Plains, constitute an area of relatively recent agricultural settlements. This short-grass country was first occupied by cattle and sheep ranches and was not considered suitable for arable agriculture. However, as the frontier was pushed westward a pattern of agricultural settlement, mostly quarter-section and half-section farms, was fostered by the Homestead Act, by railroads, real estate agencies, and by the customs and traditions of the new settlers. Oversettlement was also encouraged by seasons having above normal rainfall.

By and large, an attempt was made to superimpose on the Plains an agricultural system which probably was well adapted to the more humid regions of the United States. This resulted in failure for many of the new settlers. If agriculture were to be successful in the new environment, it would require a much larger land base. Many new soil and moisture conserving practices had to be adopted and social institutions such as schools, churches,

roads, and governmental services had to be adjusted to the sparsely settled Plains.

The severe difficulties which the residents of South Dakota encountered during the 1930's were due to this rather general maladjustment of their social institutions to the Plains environment, depression, and drought. These influences operated more or less jointly and the first two greatly reduced the capacity of the people to tide themselves over the emergency of the drought.

As a result of the first World War, which stimulated the demand for wheat and other agricultural products, all land in farms in South Dakota increased by 33.1 percent between 1910 and 1920. The value of farmlands and buildings was boosted by inflation from \$1,005,080,807 to \$2,472,893,681—an increase of 146 percent. The post war decade (1920-1930) saw these inflated values scaled down sharply to \$1,285,153,538 in 1930. A further reduction of farm values took place from 1930 to 1940 so that farmlands and buildings in 1940 were worth only about half of what they were worth in 1910. A new re-inflationary period began with the second World War. The course of these fluctuations may be observed in the data presented in Table 3.

During the early 1930's, the prices received for farm commodities dropped and a great margin of disparity developed between the prices farmers paid for machinery, freight, supplies, and taxes and the prices they received for their products.

Table 3. Data Pertaining to Farms and Farm Population in South Dakota, 1890—1950

Year	Number of Farms	Land in Farms Acres	Value of Farm— Land and Buildings	Farm Population*
1890	50,158	11,396,460	107,466,335	
1900	52,622	19,070,616	220,133,190	
1910	77,644	26,016,892	1,005,080,807	370,820
1920	74,637	34,636,491	2,472,893,681	362,221
1930	83,157	36,470,083	1,285,153,538	390,205
1940	72,454	39,473,584	505,452,178	307,318
1945	68,705	43,031,964	764,299,619	253,899
1950	66,452	44,785,529	1,384,195,160	254,059

Sources: *Fourteenth Census of the United States, 1920*, p. 645, Vol. 6, part 1, *United States Census of Agriculture, 1945*, p. 114, *1950 Census of Agriculture*, Vol. 1, part 11, North Dakota and South Dakota; also Release, Nov. 15, 1951, *1950 United States Census of Population*, South Dakota, General Characteristics, 41-29.

\*The farm population includes the urban-farm population; namely 774 in 1930, 648 in 1940, and 514 in 1950.

**Unemployment Was Extensive in Rural Areas of South Dakota.** The short-grass spring wheat area of the Northern Plains was one of the distressed areas. The Federal Government began a series of emergency programs which included seed and feed loans, cattle purchases, subsistence grants, and public works projects. Several studies of the region appeared shortly after the severe droughts in 1934 and in 1936 which described the extent and consequences of these natural calamities.<sup>5</sup> Economic and social conditions and adjustments in South Dakota were also discussed in several Experiment Station studies.

Very little attention has been paid to the data pertaining to the extent of unemployment in the state in 1937 and 1940. This problem was distinctly related to the extensive migration from the state from 1930 to 1945.

A special Nation-wide census of unemployment was taken from November 16 to 20, 1937 according to an act of Congress. Persons who were totally unemployed, partly unemployed, or employed on emer-

gency public works projects sponsored by the Federal agencies such as the Works Projects Administration, the National Youth Administration, and the Civilian Conservation Corps registered voluntarily.

This voluntary registration was conducted by the Post Office Department in cooperation with other Federal agencies. It was followed by an enumeration of unemployed in a sample of selected areas, taken in order to establish the degree of completeness of the voluntary registration. The number employed on emergency projects was known, and relatively complete. But probably not over two-thirds of the totally unemployed actually registered.

The burden of unemployment fell heavily upon farm laborers and the rural youth of the state. New workers (whose unemployment cards indicated that they had no

<sup>5</sup>See the following studies: P. G. Beck and M. C. Forster, *Six Rural Problem Areas: Relief, Resources, Rehabilitation*, Federal Emergency Relief Administration, (Nov. 1935); Francis D. Cronin and Howard W. Beers, *Areas of Intense Drought Distress, 1930—1936*, Works Progress Administration Research Bulletin, (Jan. 1937); Conrad Taeuber and Carl C. Taylor, *The People of the Drought States*, Same Series, (Mar. 1937); Irene Link, *Relief and Rehabilitation in the Drought Area*, Same Series, (June 1937).

usual occupation) made up a large percentage of all unemployed. Approximately 30 percent of all new workers were from 15 to 19 years of age and nearly another 30 percent from 20 to 24 years.

***The Drought Emergency in Tripp County, 1934.*** During the drought years, field research workers employed by the Federal Emergency Relief Administration investigated economic and social conditions in several counties in South Dakota as well as in other parts of the United States. Reports pertaining to Haakon, Harding, and Tripp Counties were issued in October, 1934. They presented data showing the extent of the relief situation, described the causes of the economic distress, and made a number of recommendations as to how the people might be assisted either by migration from the area or by rehabilitation in the communities where they lived.

One of these reports by Landis, Randlett, and Hill described social and economic conditions in Tripp County. This county is located in the south central part of South Dakota and borders on Nebraska. It was formerly a part of the Rosebud Indian Reservation and was one of the last parts of the public domain in the state to be opened for settlement. This occurred in 1909. The authors described the influx of settlers, the overpopulation and later out-migration, and the general problem of population adjustments as follows:

People in all walks of life, school teachers, barbers, waiters, clerks, laborers, and the like, many of them from urban

centers and without farm experience, flocked in by the hundreds, until almost every quarter section of the land was occupied, and the County greatly overpopulated. In 1930 the County had a total population of 12,712, which was approximately 9 percent less than in 1925. Twenty-five percent of its people in 1930 lived in incorporated villages, and the remainder in the open country. It is stated that, beginning in 1924, a decrease in population had characterized each year since, the most marked loss occurring during 1934.<sup>6</sup>

In June 1934, 7,461 persons, or 59 percent of the 1930 population, were receiving relief. The work relief program, while it has provided subsistence, has not kept the people sufficiently employed to save them from despair.

At the present time (July 1934) the County presents a picture of desolation which would be hard to duplicate in an agricultural area. Successive years of drought and grasshopper plagues have almost completely destroyed vegetation and left the bare soil to be shifted by the prevailing high winds. Absence of vegetation has made the heat more intense and added to the discomfort of a discouraged people. Properties have been allowed to deteriorate, livestock has been sold and feed resources have long been depleted.

People anticipate serious difficulties in replenishing herds, revitalizing the soil, facing obligations, and re-establishing themselves. Any program of rehabilitation must face the fact that the County is overpopulated and that little can be done to re-establish the excess within the present borders. For those families remaining, capital assistance will be the chief need.

An analysis of a sample of farm families on relief revealed that there were no chronic relief cases. "Prior to 1933, very few applied for relief, and none of the cases studied received the relief before 1930." More than four-fifths of those on relief were in that condition because of

<sup>6</sup>Tripp County had a population of 10,712 in 1935; 9,937 in 1940; 8,568 in 1945; and 9,139 in 1950.

crop failures caused by drought. The rest related their condition to unemployment, inability to work, or other causes.

From 1920 to 1934, 11 bank failures occurred in Tripp County, entailing a loss of \$1,105,315. The per capita payments by the Federal Emergency Relief Administration or by the Agricultural Adjustment Administration and by other relief agencies reached \$185.

The problem of adjustment of population to resources in Tripp

County was typical of the much larger regional problem—though it was, perhaps, somewhat more severe than in other areas of the state.<sup>7</sup> The foregoing conditions do not prevail in Tripp County at present, owing to a more favorable climatic and economic situation.

<sup>7</sup>Paul H. Landis, Gordon Randlett, and George W. Hill, *Rural Problem Areas Survey Report No. 4: The Short-Grass Spring Wheat Area, Tripp County, South Dakota*, October 5, 1934, pp. 1-5. This report was reproduced from an original manuscript report of 60 pages with tables and photographs filed in the Research Section, Division of Research, Statistics and Finance, Federal Emergency Relief Administration.

## A Review of Population Trends in South Dakota, 1890-1950

THE COMPARATIVELY rapid increase of South Dakota's population from 1870 to 1930 is shown in Table 4 and also in Fig. 2. They indicate also that South Dakota's population reached its peak in the census of 1930 with 692,849 inhabitants. But a decrease of about 50,000 persons occurred from 1930 to 1940; and only a small increase of about 10,000 persons occurred from 1940 to 1950. During the same period, the United States had an unprecedented increase of more than 19,000,000 persons in its total population. Since South Dakota normally has a large excess of births over deaths and since many of its urban areas have experienced a rapid growth during the post-war years, a much larger population increase might have been expected.

The settlement of that part of Dakota Territory which became the state of South Dakota occurred mostly from 1880 to 1890. The population of the new frontier state which was admitted to the Union on November 2, 1889 increased by nearly 250,000 from 1880 to 1890. But the drought-ridden decade of the 1890's discouraged the further influx of settlers and induced many

to leave. A new influx of people came to South Dakota from 1900 until the outbreak of the first World War. The western plains of the state were opened to homesteaders, new railway lines or extension branches were built, and new trade centers were established in many parts of the state.

The first pioneer settlements attracted not only persons of native American stock, but also a large element of foreign-born whites who came chiefly from Norway, Denmark, Sweden, Austria, Russia, England, Ireland, and English-speak-

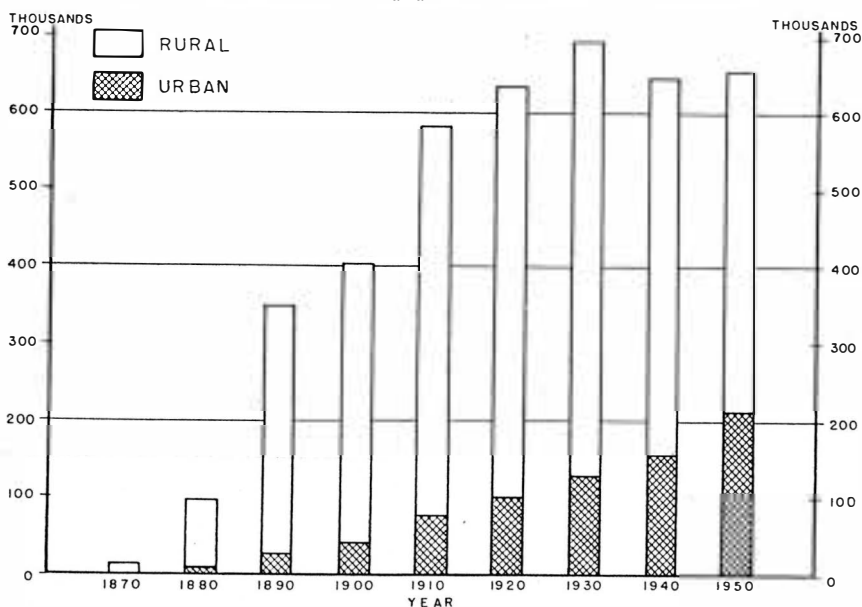


Table 4. Population in South Dakota, 1870 to 1950, with Percent of Increase or Decrease in Urban and Rural Areas

Census Year	Population of South Dakota			Percent Increase or Decrease Over Preceding Census		
	The State	Urban Area	Rural Area	The State	Urban	Rural
1870	11,776		11,776			
1880	98,268	7,208	91,060	734.5		673.3
1890	348,600	28,555	320,045	254.7	296.2	251.5
1900	401,570	40,936	360,634	15.2	43.4	12.7
1910	583,888	76,469	507,419	45.5	86.8	40.7
1920	636,547	101,872	534,675	9.0	33.2	5.4
1930	692,849	130,907	561,942	8.8	28.5	5.1
1940	642,961	158,087	484,874	-7.2	20.8	-13.7
1950	652,740	216,157	436,583	1.5	36.7	-10.0
1950 (With rural-urban adjustment)*	652,740	198,692	454,048	1.5	25.7	-6.4

\*All urban population data were adjusted so that only the areas listed as urban in 1940 were included in the urban category in 1950. Six incorporated places which had population increases above 2,500 inhabitants from 1940 to 1950 were included in the *rural* category for 1950. South Dakota has one *urbanized* area located in Union county adjacent to Sioux City, Iowa. The population of this area in 1950 was 553 persons.

Fig. 2. Urban, rural, and total population in South Dakota, 1870-1950



ing parts of Canada. In 1890 the foreign-born population constituted over one-fourth (26.1 percent) of the state's population. During the first World War immigration from abroad practically stopped, but it was revived again during the 1920's.

Immigration laws were then enacted which tended to reduce the number of immigrants that would be admitted to the United States. During the depression years of the 1930's, emigration exceeded immigration for South Dakota.

According to the census of 1950, the foreign-born white population numbered only 30,767 persons. Since the foreign-born element is heavily concentrated in the upper-age brackets, it has a relatively high death rate; and since at the same time, this element is not being renewed by additions from abroad to any considerable extent, it is now decreasing rapidly. The number of foreign-born in relation to the total population is shown in Fig. 3.

Sometime between 1930 and 1940 South Dakota ceased being a state which gained population through migration from other states; instead it became a state which lost population through inter-state migration. This is evident from the data presented in Table 5. It is also quite clear that the state might have an increasing population if it could retain a larger proportion of those born in the state than it now does. The preliminary figures for 1950 re-

Fig. 3. Place of birth of South Dakota's population, 1890-1950

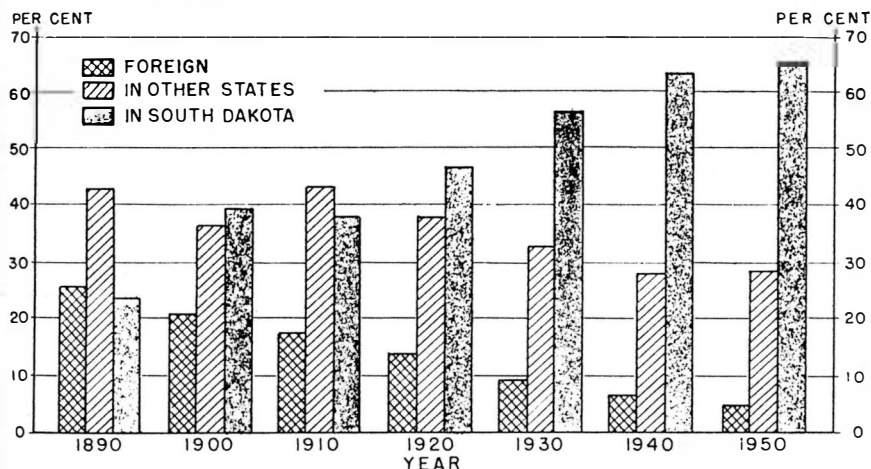


Table 5. Net Effect of Migration in South Dakota, 1890—1950

Census	Born in South Dakota			Born in Other States and Living in South Dakota	Gain or Loss (-) Through Migration
	Total	Living in South Dakota	Living in Other States		
1950	782,255	435,000	347,255	184,000	-163,255
1940	683,117	414,566	268,551	182,434	-86,117
1930	583,112	391,393	191,719	233,454	41,735
1920	432,691	303,260	129,431	247,194	117,763
1910	305,604	225,125	80,479	254,762	174,283
1900	203,561	160,220	43,341	150,945	107,604
1890	92,790	83,246	9,544	152,932	143,388

Sources: U. S. Department of Commerce, Bureau of the Census, Release dated May 31, 1953. "Native-born Americans in South Dakota Population Number 619,000;" and June 8, 1953 "Number of Persons Residing in Their State of Birth in 1950." Same. *Sixteenth Census of the United States, 1940*. Special Report: *State of Birth of the Native Population*, p. 9. Same. *Thirteenth Census of the United States, 1910*, Vol. 1. *Population, General Report*, pp. 700, 701, 714, and 732.

veal that about 184,000 persons now living in South Dakota were born in other states while 347,255 persons who were born in South Dakota live in other states. Thus through inter-state migration, South Dakota has lost about 163,000 persons.

### **Changes in Rural and Urban Residence of Population, 1870-1950**

The growth of population in the urban and rural areas of the state from 1870 to 1950 is presented in Table 4. While the urban areas have had a relatively rapid rate of population increase throughout the history of the state, the rural areas have experienced marked losses during the last two decades.

Attention should be called to the fact the urban area includes the aggregate population of all the incorporated places having 2,500 inhabitants or more. The number of such places increased from four in 1890 (Aberdeen, Huron, Sioux Falls, and Watertown) to 25 such places in 1950. These urban places included a total population of 216,157 or 33.1 percent of the state's population in 1950.

Table 4 shows both adjusted and nonadjusted 1950 figures for urban and rural areas of the state. These adjustments were made in order to make 1940 and 1950 data more nearly comparable for the purposes of this study. Six incorporated places which had less than 2,500 inhabitants in 1940 but more than that in 1950 were included in the *rural* category for 1950. These places were: Belle Fourche, Lemmon, Redfield, Spearfish, Webster, and Winner. South Dakota has one city with

more than 50,000 inhabitants, namely, Sioux Falls. Minnehaha County and Sioux Falls which have a combined population of 70,910 are therefore classified as a standard metropolitan area by the Bureau of the Census.

The rural population includes both farm and nonfarm residents. The farm population comprises all persons living on farms without regard to occupation. The rural nonfarm population includes persons living in various types of residence, such as isolated nonfarm homes in the open country or incorporated villages and hamlets having less than 2,500 inhabitants, and also the fringe areas adjacent to the larger urban incorporated places but not included within their limits.

### **Changes in the Farm Population of South Dakota, 1910-1950**

The farm population of South Dakota reached its highest number in 1930 when the census reported 390,205 residents on farms of the state. The first census of this population element was taken in 1920. But the Bureau of the Census estimated the state's farm population as 370,820 in 1910. This was a much larger proportion of the state population (63.5 percent) than it has been at any time since then. The rural farm population was only 38.9 percent of the state's in 1950.

Until about 1940 there was a steady upward increase of elderly farm operators. During the last decade changes occurred which resulted in a somewhat younger age-composition of farm operators in South Dakota. Owner-operators un-

der 35 years, for example, were 9.1 percent of all owner-operators in 1940, but increased to 14.5 percent of all owner-operators in 1950.

Farm tenants are as a rule a much younger group than farm owners. Although there was a large decrease in farm tenants under 35 (from 12,334 in 1940 to 9,005 in 1950), there was an increase in the proportions of this age-group from 33.3 percent in 1940 to 49.8 percent in 1950. Comparisons with 1945 data reveal that this change occurred particularly during the recent post-war years. Without doubt, many young farm operators took over in place of older men who retired. The general farm prosperity toward the close of the decade made it possible for many of the older group to retire. As the years go by, more and more of them will find it necessary to retire. If younger farm operators and homemakers take the place of the older folks, this replacement process may indicate some potential growth of the farm population. However, this prospect may be nullified by the tendency to merge farms and ranches.

### **Changes in the Rural-Nonfarm Population in South Dakota**

The rural-nonfarm population is composed mostly of the residents of incorporated places of less than 2,500 inhabitants and of unincorporated villages and hamlets. It includes also a considerable number of families and persons who reside in the open country but who are not farming.

Near the larger urban centers of population there are extensive de-

velopments of housing and business enterprises of many kinds which are not a part of the municipal incorporated areas. This urban periphery has had a rapid growth of population and has a relatively young age-composition. The heads of these nonfarm families are often commuters to the city offices or shops where they are employed. This group differs very much from the population of small towns and villages in family life, length of residence, in income, and outlook.

The rural-nonfarm population includes some of the most rapidly growing population aggregates in the state as well as villages and small hamlets which are losing population. As a whole, it increased by only 2.4 percent during the past decade. In Fig. 4 it appears as a rather stable population element. However, this does not take into consideration all the factors.

Table 6 summarizes population changes from 1940 to 1950 in 34 townships which are adjacent to urban places in South Dakota. Although annexations have transferred some of the population increase to urban areas, most of these suburban townships had a greater rate of increase than the urban population as a whole. Suburban areas near the larger cities of the state are undergoing a rapid process of housing development and are attracting a variety of business and recreational establishments. This population element is a part of the main city in its economic and social functions but its government is not integrated with the city.

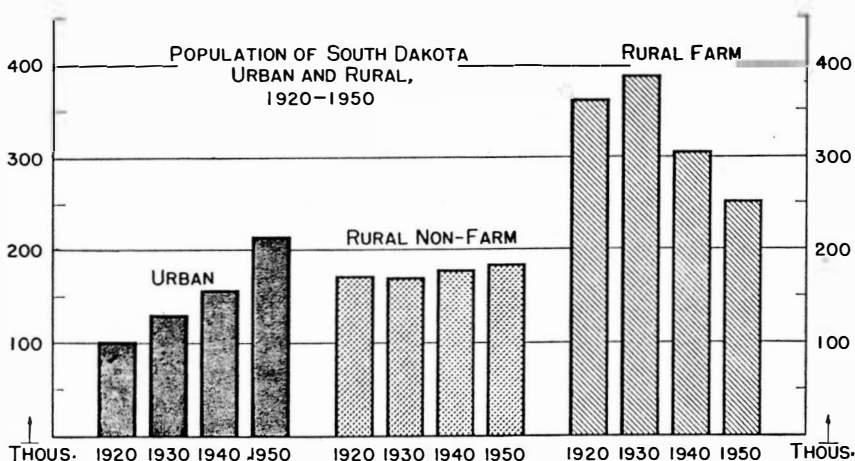


Fig. 4. Urban, rural-nonfarm, and rural-farm population of South Dakota, 1920-1950

#### Population Changes of Small Towns, 1900-1950

In the recent census, South Dakota had 306 incorporated places with less than 2,500 inhabitants each and 1 unincorporated place (the new and unique Pickstown located near the Fort Randall Dam) which had 2,217 inhabitants. Over the years the number of incorporated places with less than 2,500 inhabitants has risen from 122 in 1900 to 282 in 1950. Since 1940 only 4 places have been added to the roster of the state's incorporated municipalities—Bison, Buffalo, Hill City, and Long Lake.

The data in Table 6 indicate the number of rural incorporated places which had increases or decreases in population as shown by decades from 1900 to 1950. As these places were incorporated and their inhabitants enumerated separately, it became possible to compare their population at the beginning and at the close of each decade.

It may be observed that there is a steady increase over the past half century in the number of places showing *decreases* of population. It should also be noted that the larger places have not suffered population decreases nearly as frequently or as extensively as the smaller places. For example, in the group of places having from 1,000 to 2,500 inhabitants it was possible to compare 37 places from 1940 to 1950. Ten of these places had population decreases but twenty-seven had increases.

In contrast 104 places in the group having less than 250 inhabitants could be compared. Of this group 80 places had decreases, and only 24 increases. One may observe that these rural trade centers made their best upward stride in population between 1910 and 1920. More of them experienced population increases and fewer of them experienced decreases during that decade than any

Table 6. Number of Rural Incorporated Places Having Changes in Population, as Specified, by Decades, 1900—1950

Decrease or increase Size of Population	Places Having Increases or Decreases, by Decade				
	1940-50	1930-40	1920-30	1910-20	1900-10
<i>Rural Incorporated Places Compared:</i>					
All Places .....	283	281	260	221	122
<i>Places Having Decreases, by Size of Population:</i>					
All Places .....	176	148	151	44	8
1,000 to 2,500 .....	10	13	19	6	3
500 to 1,000 .....	33	30	50	8	1
250 to 500 .....	53	56	40	17	2
Less than 250 .....	80	49	42	13	2
<i>Places Having Increases by Size of Population:</i>					
All Places .....	107	133	109	177	114
1,000 to 2,500 .....	27	28	21	27	13
500 to 1,000 .....	30	30	24	45	26
250 to 500 .....	26	38	35	61	35
Less than 250 .....	24	37	29	44	40

time since. Even in the largest classification, places having from 1,000 to 2,500 people, there was a large number which showed decreases (19 cases) from 1920 to 1930. Automobiles and motor trucks began to make their influence felt in the marketing and trade practices of farm people during the 1920's.

In the analysis of the population trends of trade centers, 298 places were compared from 1930 to 1950. Twenty-five municipalities with populations of 2,500 or more were classified as urban; and the remaining 273 places were classified as rural. This is the group examined in the following paragraphs. (See Table 7 and Fig. 5.)

Consider first the towns having from 1,000 to 2,500 inhabitants. There were 34 of them including Pickstown. These places had a fairly substantial population increase (10.4 percent) from 1940 to 1950. This group included three towns which had a much greater rate of in-

crease than any other city in the state. These towns were Pickstown and Lake Andes which are located near the Fort Randall Dam and which obtained their population increases from the employment of construction workers and other personnel at this dam. The third community with an exceptional rate of increase was South Sioux Falls, near Sioux Falls, whose population increased from 591 in 1940 to 1,586 in 1950. Of the remaining 31 places, 10 had increases of 10 percent or more; 13 had increases of less than 10 percent; and 8 had decreases of less than 10 percent.

It is likely that some of the more favorably situated trade centers in this classification will have increases of population which will classify them as urban centers during the next decade, but the majority of the group will probably have a fairly stationary population. These places are potentially strong centers of a

Table 7. Average Population of Incorporated Places in South Dakota, 1930, 1940, and 1950

Size of Population in 1950*	Number of Places Compared 1930-1950	Average Population			Percent:
		1930	1940	1950	Increase or Decrease (-) 1930-1950
Urban					
50,000 and over .....	1	33,362	40,832	52,696	58.0
10,000 — 49,999 .....	5	11,794	12,590	16,794	42.4
2,500 — 9,999 .....	19	2,962	3,566	4,184	41.3
Rural					
1,000 — 2,499 .....	33	1,206	1,266	1,398	15.9
500 — 999 .....	58	650	671	697	7.2
250 — 499 .....	71	407	384	266	-10.1
250 — 499 .....	71†	407	384	366	-10.1
Less than 250 .....	111†	192	184	149	-22.4

\*The incorporated places were classified by size of population in 1950 and retained in these classes regardless of population in 1930 and 1940.

†The 1950 census lists 75 incorporated places of 250--499 population and 115 with less than 250. Data for comparison from 1930 to 1950 was not available for 4 places in each of these classes.

rural-urban community life. They are, as someone said, "large enough to serve you and small enough to know you." Eighteen of the thirty-four towns are county seats.

**Three Groups of Towns Having Less Than 1,000 Inhabitants.** Small towns of less than 1,000 inhabitants are numerous, but their aggregate population is not large. South Dakota had 248 incorporated places which ranged from 16 to 989 inhabitants in the census of 1950. Their aggregate population was 85,331 or 13.1 percent of the state's population. The classification of these places according to the size of population in 1950 is shown in Table 7. It was possible to compare population of 240 places through the last two decades.

There were 58 places with from 500 to 1,000 inhabitants. Their population showed an increase of 7.2 percent from 1930 to 1950. While their population increased slightly, the

rate of their population growth was much less than the normal rate of population growth (which amounts to about 1.5 percent in 1 year or 15 percent in 10 years). These places are really losing population through migration.

In the two groups of the smaller villages, there were population decreases during the last two decades. The smallest places, the 111 incorporated villages having less than 250 inhabitants, had the most extensive losses—an average of 22.4 percent from 1930 to 1950.

Small towns have many common characteristics. But the above analysis indicates that they are subject to both similar and dissimilar influences. It is primarily the great and pervasive changes in the means of travel, transportation, and communication which have influenced their economic function and, more indirectly, their population.

In the perspective of decades, some of them have grown to become

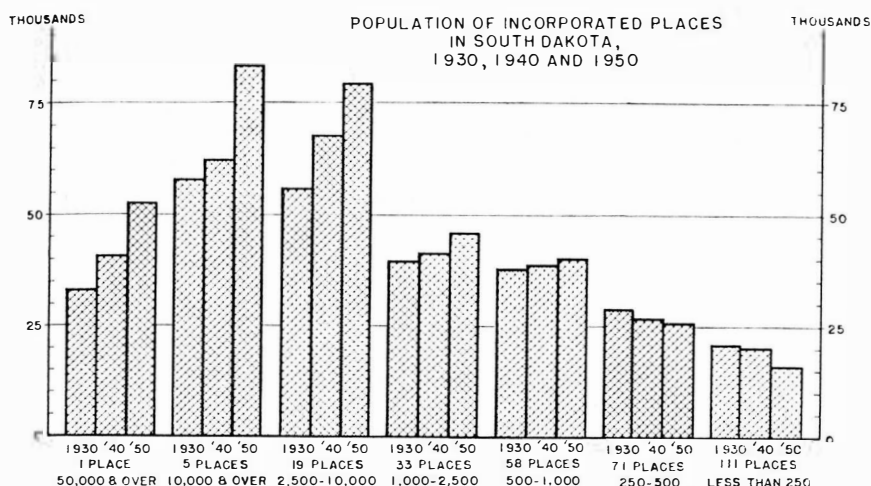


Fig. 5. Increase or decrease of population in incorporated places of different sizes, 1930-1950

urban commercial and industrial centers. This competitive process which involves the rise of some and the decline of others is still taking place. The small towns came into existence as trade centers during the era of horse-drawn wagons, railroad transportation, poorly improved roads, and isolated conditions of country life. The reason for their being has been basically changed by common use of automobiles, paved highways and all-weather roads, transportation by motor trucks, and bus route service. In many cases, services and functions which they once had (such as banks, hotels, newspapers, post offices, professional services, organized activities of lodges, and many other kinds) have been discontinued. Although many of their functions have been discontinued, new vital services may have taken their place.

#### Recent Changes Related to Children and the Family

One of the most evident population changes in the last two decades has been the increase in the birth rate which has occurred since 1946. This was preceded by a gradual decline from the peak which occurred in 1921 after the first World War—a general and widespread kind of social change. As a result, the number of children under 5 years of age decreased both in the state and in the Nation from 1920 to 1940. Table 8 shows, for example, that children under 5 years in South Dakota decreased from 79,831 in 1920 to 57,863 in 1940; but the same group increased again to 76,713 in 1950. Consequently, the long-time trend of the ratio of children under 5 per thousand women 15 to 44 years of age, has been reversed. This ratio dropped from 732.7 children per thousand women in 1890 to 401.9



Table 8. Children Under 5 Years per 1,000 Women, 15—44 Years of Age in South Dakota and United States

Census	South Dakota			United States		
	Children Under 5 Years	Women 15-44 Years	Ratio of Children per 1,000 Women	Children Under 5	Women 15-44 Years	Ratio per 1,000 Women 15-44 Years
1950 .....	76,713	133,940	572.7	16,163,571	34,205,803	472.5
1940 .....	57,863	143,967	401.9	10,541,524	32,035,291	329.1
1930 .....	71,324	153,807	463.7	11,444,390	29,242,437	391.4
1920 .....	79,831	140,962	566.3	11,573,230	24,756,342	467.5
1910 .....	73,489	127,079	578.3	10,631,364	21,768,408	488.4
1900 .....	55,217	82,320	670.8	9,170,628	17,715,856	517.7
1890 .....	49,173	67,482	728.7	7,634,693	14,429,098	529.1

Sources: 1950 *United States Census of Population. South Dakota; General Characteristics*, p. 41-33. *Ibid.*, U. S. Summary; *General Characteristics*, p. 1-93.

children per thousand in 1940 and increased suddenly to 572.7 children per thousand women 15 to 44 years of age in 1950. (See Table 8.)

The big change in the birth rate is most evident in the recent statistics pertaining to pre-school children. But it should be noted that the increase in the age-group under 5 years since 1940 has not been nearly as pronounced in the rural-farm population as it has been in the rural-nonfarm or the urban population. In the urban classification, the increase was 99.2 percent while in the rural-farm area the increase was only 5.7 percent. In the rural-nonfarm classification the increase was 29.7 percent.

Since it is not possible to compute the crude birth rate for these three population groups, the rate of population growth is indicated by means of the ratio of children under 5 per thousand women of the reproductive age-group from 15 to 44 years. In the computation of these ratios, it is necessary to avoid errors traceable to the fact that a large proportion of single women migrate from rural to urban areas. The ratio of

children to women should, therefore, be calculated upon the basis of *married women*. This has been done in data presented in Table 9.

The data in Table 9 show that the increase in the number of children in urban areas has been much greater than that which took place in rural-nonfarm and rural-farm areas. The rural-farm ratio of children to women had increased considerably by 1950, but had not reached the level of 1930; but the urban ratio in 1950 (743.6) had risen much above the ratio of 1930 (575.3). At present, there is, and for some time there will be, something like a tide of youngsters in the larger urban areas of the state. Most population experts, however, seem to agree that it is a temporary phenomenon which is related to the present urban boom and prosperity and which is likely to drop off as the boom itself levels off.

*Recent Changes in the Size of Families and Households.* What is happening in regard to the size of the average family? Is it getting larger or smaller? Has the pro-

nounced increase in the birth rate resulted in larger average families, or is it due primarily to the fact that there has been an increase in the number of families? In particular, what are the facts in regard to the farm households or families? How do they compare with urban families?

The data have been assembled from census reports for 1930 pertaining to families and from reports for 1940 and 1950 pertaining to occupied dwelling units, households, and families. In 1930 the United States Census used the term "family" as being interchangeable with "household." A family was defined "as a group of persons, related either by blood or by marriage or adoption who live together as one household, usually sharing the same table."

Single persons living alone were also counted as families (or households) as were a few small groups of unrelated persons sharing the same living accommodations; but households reporting more than 10 lodgers were classified as boarding or lodging houses rather than as families. The principal difference between a family and a household

is that the latter may include non-related persons such as hired help, boarders, and lodgers who usually should not be included in the concept of the family, at least when that term is used in its more limited connotation. In the 1950 *United States Census of Housing*, a household consisted of those persons who lived together in one dwelling unit, and the count of occupied dwelling units was the same as the count of households.

The data which indicate the size of the average household (or family in a rather broad sense) in 1930, 1940, and 1950 are shown in Table 10. They seem to indicate a definite trend toward smaller families and households. The extent of the decrease was nearly the same in each decade for the state as a whole. From 1930 to 1940 each of the three residence classifications had decreases of about the same extent; but from 1940 to 1950 the urban households (or families) *increased*, and the rural-farm households (or families) *decreased* to such an extent that they were about equal in average size when the last census was taken. Both urban and rural-farm households were larger than

Table 9. Children Under 5 Years in South Dakota and Its Rural Farm, Rural Nonfarm, and Urban Population in 1930, 1940, and 1950, with Ratios Per 1,000 Married Women from 15 to 44 Years of Age

Rural-Urban Residence	Children Under 5 Years of Age			Ratio of Children Under 5 Per 1,000 Married Women 15 to 44 Years of Age		
	1930	1940	1950	1930	1940	1950
State .....	71,324	57,863	76,713	775.4	687.7	798.3
Rural Farm .....	44,819	29,623	31,323	887.2	786.6	847.1
Rural Nonfarm .....	15,410	15,627	20,266	694.8	670.9	799.8
Urban .....	11,095	12,613	25,124	575.3	543.9	743.6

Source: Data from *United States Census of Population*. Ratios calculated by author.

Table 10. Average Number of Persons per Occupied Dwelling Unit for the White and Nonwhite Population in South Dakota, by Rural-Urban Location, 1930, 1940, and 1950

	White Population			Nonwhite Population		
	1930	1940	1950	1930	1940	1950
State .....	4.28	3.86	3.41	4.93	4.89	5.02
Rural Farm .....	4.66	4.21	3.86	4.83	5.10	5.18
Rural Nonfarm .....	3.82	3.55	3.13	5.32	4.74	5.02
Urban .....	3.99	3.63	3.90	4.86	4.02	4.58

Sources: *Sixteenth Census of the United States, 1940. Housing, Second Series; General Characteristics, South Dakota. Table 1. 1950 United States Census of Housing, South Dakota; General Characteristics. Table 4, p. 41-5.* See the text regarding the comparability of the data. Figures in this table were recalculated for 1950.

the rural-nonfarm households (or families).

Data are also presented for the nonwhite population of South Dakota. This group is predominately Indian. Two significant points may

be observed: first, the average non-white household has increased in size since 1930; and second, the non-white rural-farm households are larger than the rural-nonfarm or urban households.

## Area Adjustments of Population in South Dakota, 1930-1950

IN THE DISCUSSION which follows, it will be evident that there are great differences among the areas of South Dakota in their agriculture, density of population, and many related economic and social conditions. There are also great differences in the extent of the emergency of the 1930's, in the economic and social recovery which followed during the past decade, and in the adjustment of the population to resources.

### Description of Economic Areas in South Dakota

In order to facilitate this analysis, South Dakota has been divided into eight economic areas. These economic areas are designated by a number and a geographic description. Each area, as outlined in this bulletin, is essentially the same as "a generalized type of farming area" used in studies by the Bureau of Agricultural Economics or as designated "an economic area" by the Bureau of the Census.

One distinct modification of areas has been introduced. The western

South Dakota range area has been divided into two areas (1a and 1b). One of these areas (1b) is made up of two parts and includes eight counties which to a large extent are, or were, Indian Reservations. When it is possible, geographic description is used; but in the tables the areas are frequently referred to by number only. The terms "economic area" or "region" are used interchangeably and in a rather nontechnical sense.

The boundaries of each area are shown in Fig. 6 and the geographic



Table 11. Resignation and Size of Economic Areas in South Dakota\*

Geographic Description	Number	Economic Area Description†	Square Miles	Percent of State	Percent of State's Population 1950
Western Range Area .....	1a	Northern Great Plains range livestock; seasonal, nonmigratory grazing .....	27,444	35.9	17.7
Western Range Area (with Indian Reservations) ....	1b	Same as 1a .....	11,435	14.9	4.0
North Central Area .....	2a	East of Missouri; wheat, small grains, and livestock .....	9,816	12.8	8.6
North James River Area ..	2b	Spring Wheat-corn transition and livestock .....	7,355	9.6	14.5
South Central Area .....	3a	Northwestern corn-livestock transition .....	5,205	6.8	5.3
South James River Area ..	3b	Western Corn Belt fringe and livestock feeding .....	5,542	7.2	12.8
Northeastern South Dakota .....	4a	Northwestern Corn Belt fringe and livestock .....	5,262	6.9	13.3
Southeastern South Dakota .....	4b	Central Missouri River valley; Corn Belt, cattle feeding, hogs .....	4,477	5.8	23.8
		South Dakota .....	76,536	100.0	100.0

\*Sources: U. S. Department of Agriculture, Bureau of Agricultural Economics, *Generalized Types of Farming in the United States*. U. S. Department of Commerce, Bureau of the Census, *State Economic Areas*, by Donald J. Bogue. C. R. Hoglund, *Facts for Prospective Farmers and Ranchers in South Dakota*, South Dakota Agricultural Experiment Station, Circular 59, June, 1945.

†Used by the Bureau of Agricultural Economics, U. S. Department of Agriculture.

Ziebach Counties and also the Pine Ridge Indian Reservation located in Shannon, Washabaugh, and Todd Counties. This area includes also Mellette and Bennett Counties which formerly were a part of Indian reservations. More than half of the total Indian population of the state in 1950 were residents of this area. It is the most sparsely settled area in the state. Many of the distinct differences between this area and the remainder of western South Dakota are traceable to the Indian population and the reservation system. During the last decade, there was a large scale migration of Indians from the reservations to Rapid City and to other localities where employment was available.

**Area 2a. North Central South Dakota.** This area lies east of the Missouri River and shows a transition between the more intensive farming to the east and the range area to the west. About 60 percent of the land is in grazing and wild hay. Wheat is the important cash grain crop. Beef cattle and sheep are also important enterprises. Farms averaged 828.9 acres in size. The annual rainfall ranges between 16 and 20 inches.

**Area 2b. The North James River Area.** This is the major wheat and cash grain area of the state. Corn occupies less than one-fourth of the cropland. Beef cattle, hogs, sheep, poultry, and dairying are important

enterprises. Extensive use is made of combines in this area. The average size of farm is 470 acres. Annual rainfall averages about 20 to 22 inches. The proposed Missouri-Oahe irrigation project lies mostly in this area of the state.

**Area 3a. South Central South Dakota.** This area includes Gregory and Tripp Counties west of the Missouri and Aurora, Buffalo, Brule, and Jerauld Counties east of the Missouri. It includes a part of the Brule Indian Reservation. It is a transition area between moderately intensive livestock farming to the east and extensive livestock ranches to the west. Corn, sorghum, barley, and wheat are the chief crops. The average size of farms and ranches was 665.9 acres in 1950. Rainfall averages about 18 to 20 inches.

**Area 3b. The South James River Area.** This area is a part of the western fringe of the Corn Belt. It is a moderately intensive crop and livestock farming area. Hogs and cattle feeding and dairying and poultry are the main sources of income. Corn, barley, and oats are the principal feed crops. Farms average about half a section (324.2 acres). Rainfall ranges from 20 to 24 inches.

**Area 4a. Northeastern South Dakota.** This is the lake region of South Dakota. Wheat, flax, and potatoes are important cash crops. Corn, oats, and barley are the main feed crops. A large part of the hilly lands is used for pasture and hay. Alfalfa production is becoming more important. Rainfall averages about 22

to 24 inches per year. Farms average about 300 acres in size.

**Area 4b. Southeastern South Dakota.** The most intensive system of livestock feeding, hogs, dairy, and poultry production is characteristic of this area. Corn is the principal crop and oats and alfalfa are other major crops. Still other crops are soybeans and flax. In the last census, the farms of this area had an average size of 214.3 acres.

### Changes in the Number of Farms According to Economic Areas, 1930-1950

What has happened to the number of farms and the size of the farms during the last 20 years? The enlargement of farms in the western and central areas of the state was one of the important recommendations made by studies of the Great Plains emergency conditions in the mid-thirties.

Some data bearing upon this question are presented in Table 12, which shows the number of farms in South Dakota and its economic areas in 1930, 1940, and 1950. The number of farms decreased practi-

Table 12. Number of Farms in South Dakota and Its Economic Areas, 1930, 1940, and 1950

Area	Number of Farms		
	1930	1940	1950
State .....	83,157	72,454	66,452
1a .....	13,062	9,934	7,985
1b .....	5,719	3,763	3,076
2a .....	9,156	7,897	7,185
2b .....	11,382	10,352	9,541
3a .....	7,053	5,569	4,874
3b .....	12,270	11,243	10,576
4a .....	11,065	10,572	10,404
4b .....	13,450	13,124	12,811

Sources: U. S. Censuses of Agriculture for 1930, 1940, and 1950. All area tabulations were made by the author.

cally all over the state through the decades shown. From 1930 to 1940, there was a decrease of 12.9 percent in the number of farms; and from 1930 to 1950, there was a decrease of 21.1 percent in the number of farms in the state.

It will be noticed that the most pronounced reduction in the number of farms occurred in Area 1b, the range area west of the Missouri which includes the Indian Reservations. In this area, there was a drop of 46.2 percent in the number of farms. On the other hand, a relatively small reduction in the number of farms occurred in Area 4b. Here there was a drop of only 4.8 percent over the two decades.

In western South Dakota, the number of farms and ranches has been drastically reduced; but in eastern South Dakota the number of farms has been very stable. The number of farms has been decreased more and more as one proceeds from the east to the west.

The data pertaining to the average acres per farm are in essential agreement with those just examined. The average acres per

farm show comparatively little change in the eastern areas of the state. But in the western ranch areas the average acres per farm or ranch is now more than twice as large as it was in 1930. (Table 13). It should be noted that this large-scale increase came as a result not only of a reduction in the number of farms, but also as a result of an increase in land in farms.

In western South Dakota (in Area 1a and 1b) all land in farms increased from 14,449,106 acres in 1930 to 21,453,662 acres in 1950. This was an increase of over 7,000,000 acres or close to 50 percent. This increase did not come primarily from the public domain. It would be more correct to say that it came from *quasi-public* domain.

### Indexes of Farm Mechanization and Electrification

*Use of Tractors, 1930-1950.* In the following sections, tables of data will be presented showing the extent to which the farms and ranches in South Dakota are making use of tractors, motor trucks, and various types of farm equipment. Extent of

Table 13. Average Acres per Farm and Farms of 1,000 Acres or More in South Dakota, 1930, 1940, and 1950

Area Number	Area Designation	Average Acres per Farm			Number of Farms of 1,000 Acres or More		
		1930	1940	1950	1930	1940	1950
	<b>State</b>	<b>438.6</b>	<b>544.8</b>	<b>674.0</b>	<b>5,223</b>	<b>7,155</b>	<b>8,767</b>
1a	Western Range	795.5	1,307.9	1,885.6	2,772	3,508	3,992
1b	Western Range (with Ind. Res.)	709.7	1,174.6	2,162.0	690	1,094	1,499
2a	North Central Area	590.4	697.2	828.9	983	1,302	1,662
2b	North James River Area	385.4	419.7	470.5	291	459	553
3a	South Central Area	424.5	535.9	665.9	340	528	744
3b	South James River Area	275.7	299.4	324.2	78	149	183
4a	Northeastern Area	280.1	293.3	309.2	57	92	111
4b	Southeastern Area	204.6	210.2	214.3	12	23	23

Sources: U. S. Censuses of Agriculture for 1930, 1940, and 1950. All area tabulations were made by the author.

Table 14. Farms Reporting Tractors, and such Farms in Percent of All Farms, by Economic Areas of South Dakota, 1930, 1940, and 1950

Area	Farms Reporting Tractors			Percent of All Farms		
	1930	1940	1950	1930	1940	1950
State .....	30,972	39,948	56,267	37.2	60.1	84.7
1a .....	5,236	4,553	6,226	40.1	45.8	78.0
1b .....	1,870	1,113	1,852	32.7	29.6	60.2
2a .....	4,762	4,544	6,442	52.0	57.5	89.7
2b .....	4,481	6,253	8,326	39.4	60.4	87.3
3a .....	2,127	2,636	4,080	30.2	47.3	83.7
3b .....	3,883	6,194	9,209	31.6	55.1	87.1
4a .....	3,575	6,230	9,082	32.3	58.9	87.3
4b .....	5,038	8,425	11,050	37.5	64.2	86.3

use of telephones, electricity from a power line or from a home plant, as well as various kinds of electrical equipment will also be considered.

Tractors were first used on the larger wheat and small-grain farms of the state. They began to appear before 1920, but they are now being used more and more commonly and have to a large extent displaced the use of horses and mules on the farms. In 1930, only 37.2 percent of all farms reported tractors; but in 1950, 84.7 percent of all farms reported tractors. In 1930 (see Table 14) region 2a, the North Central Area of the state, had a distinct lead with regard to the percent of farms reporting tractors (52 percent); but this lead has now disappeared.

When the analysis is shifted from "farms reporting tractors" to the "number of tractors on farms," a somewhat different situation appears. The basic data are presented in Table 15; and besides the actual number of tractors on farms, in the state and in the eight regions, relative indexes are introduced. In calculating these indexes, the number of tractors on farms in 1930 was set as equal to 100 percent. These indexes, then, enable one to make a quick comparison of the increase or decrease in the use of tractors since 1930 in the state and the several regions.

It will be noticed that there are marked differences among the regions in regard to their use of trac-

Table 15. Number of Tractors on Farms, by Economic Areas of the State, 1930, 1940, and 1950

Area	Number of Tractors on Farms			Percent Change in Tractors on Farms, 1930 = 100%		
	1930	1940	1950	1930	1940	1950
State .....	33,836	44,154	88,541	100.0	130.5	261.7
1a .....	5,829	5,154	10,045	100.0	88.4	172.3
1b .....	2,224	1,274	2,955	100.0	57.3	132.9
2a .....	5,359	5,044	11,063	100.0	94.1	206.4
2b .....	4,859	7,032	13,489	100.0	144.7	277.6
3a .....	2,315	2,839	6,015	100.0	122.6	259.8
3b .....	4,147	6,610	13,703	100.0	159.4	330.4
4a .....	3,792	6,866	14,625	100.0	181.1	385.7
4b .....	5,311	9,335	16,646	100.0	175.8	313.4



tors. The two eastern regions, 4a and 4b, made the most rapid gains in the acquisition of tractors, both from 1930 to 1940 and from 1940 to 1950. But the two west-river regions, 1a and 1b, actually had decreases in the number of tractors on their farms and ranches from 1930 to 1940. The setback was especially severe in the economic area which includes Indian Reservations. The North Central Area (2a) where wheat and small grain farming is prominent, also sustained the decrease during the drought decade but has more than recovered the loss as shown by 1950 figures.

### *Specified Farm Equipment, 1950.*

The last Agricultural Census taken in April, 1950 made an extensive inquiry in regard to many types of equipment on farms. Data from this

source pertaining to farms reporting automobiles, motor trucks, grain combines, pick-up balers, corn pickers, silos, and milking machines as well as the percent of all farms reporting these facilities or types of equipment are shown in Table 16. It is not feasible, however, to make comparisons with earlier years for most of these types of equipment. The actual figures are based upon a sample of schedules. Possibly the most significant items are those pertaining to motor trucks, grain combines, corn pickers, and milking machines.

Motor trucks are in use more commonly on farms and ranches in Area 1a, 2a, and 2b than in the remaining areas of the state. They are a common line of equipment on ranches, but they are much less common on Corn Belt farms. Grain

Table 16. Specified Types of Equipment on Farms in South Dakota, Tabulated by Economic Areas of the State, 1950

Specified Equipment	State	Area 1a	Area 1b	Area 2a	Area 2b	Area 3a	Area 3b	Area 4a	Area 4b
<b>Farms reporting</b>									
Automobiles .....	58,718	6,218	2,241	6,377	8,328	4,275	9,715	9,498	12,035
Tractors .....	56,267	6,226	1,852	6,442	8,326	4,080	9,209	9,082	11,050
Motor trucks .....	31,668	5,729	1,587	4,174	5,345	2,277	3,531	4,664	4,361
Grain combines .....	20,438	2,676	774	3,540	4,380	1,443	1,994	2,945	2,686
Pick-up balers .....	2,935	314	78	283	524	196	469	562	509
Corn pickers .....	25,705	571	289	1,694	3,336	2,236	6,031	4,468	7,080
Silos* .....	7,714	357	33	142	822	142	988	2,402	2,828
Milking machines ..	5,734	335	39	394	940	112	746	1,522	1,646
<b>In percent of all farms, farms reporting</b>									
Automobiles .....	88.4	77.9	72.9	88.8	87.3	87.7	91.9	91.3	93.9
Tractors .....	84.7	78.0	60.2	89.7	87.3	83.7	87.1	87.3	86.3
Motor trucks .....	47.7	71.7	51.6	58.1	56.0	46.7	33.4	44.8	34.0
Grain combines .....	30.8	33.5	25.2	49.3	45.9	49.6	18.9	28.3	21.0
Pick-up balers .....	4.4	3.9	2.5	3.9	5.5	4.0	4.4	5.4	4.0
Corn pickers .....	38.7	7.2	9.4	23.6	35.0	45.9	57.0	42.9	55.3
Silos* .....	11.6	4.5	1.1	2.0	8.6	2.9	9.3	23.1	22.1
Milking machines ..	8.6	4.2	1.3	5.5	9.9	2.3	7.1	14.6	12.8

\*Including upright and pit or trench silos.

combines are found on nearly half of all farms in the North Central Area and the South Central Area, but farms in the other regions have this type of equipment much less frequently. As to the corn pickers, one would expect that these machines would be the most commonly used in the Corn Belt areas and that is clearly shown by the figures. Over half of the farms in Area 3b and Area 4b in the southeastern part of the state reported having mechanical corn pickers in 1950, and there has undoubtedly been a considerable increase in the proportion since then.

Silos (which include both upright and pit or trench silos) are also reported more frequently in the Corn Belt areas than in the other areas. Milking machines are most often found in the three regions where there is considerable urban population. They are most often found on farms in Areas 4a, 4b, and 2b.

Table 16 shows clearly that there is a wide range of mechanization on the farms and ranches in South Dakota. The equipment and machines which are used are those that fit the prevailing types of farming or ranching. The differences between the economic areas in the use of corn picking machinery illustrates this relationship.

What are the relationships between farm mechanization and population? One commonly made observation is that the use of tractor power and large scale mechanical equipment has greatly increased the acreage that can be planted,

cultivated, and harvested per man-hour of labor used in comparison with the output per man-hour when horse-power and horse-drawn machinery is used. Machinery has *displaced* farm labor to a large extent; but it is perhaps less obvious that in some situations where farm labor is scarce or not available, it has really *replaced* farm labor.

The shift from animal power to mechanical power in farm production has greatly contributed to the timeliness in farm operations. The farmer who has tractor power and equipment to go with it is much better able to cope with unfavorable weather conditions at planting time, harvest time, and on many other occasions than those who do not have it.

As power equipment can cover more acres per hour and can be used longer hours if necessary, it has enabled farmers to do critical jobs without the delay that frequently occurred when horse equipment was used. . .

With a tractor and power equipment 3 acres of land can be prepared and planted to corn during the time that 1 acre is planted with work animals. If the tractor is put on a 24-hour schedule, which is not feasible with work animals, the preparation and planting job can be done seven times as fast as with animal power.<sup>8</sup>

Tractors, motor trucks, and the automobile have had the effect of displacing horses and mules on farms and ranches and in towns. The acreage which was formerly used for feed crops for horses and mules may now be used for other crops. Another way of looking at this change is that the use of motor

<sup>8</sup>Bureau of Agricultural Economics, U. S. Department of Agriculture, Washington, D. C. *Changes in American Farming*, by Sherman E. Johnson, p. 13. (Dec. 1949.)

power and motor vehicles has lessened the self-sufficiency of the farmer and increased the commercialization of agriculture.<sup>9</sup>

Farmers must now purchase the liquid fuels in place of the feeds they used to produce. This whole change amounts to a new adjustment of people to their resources. Tractors, motor trucks, combines, and numerous items of costly farm machinery require large financial resources. As pointed out, they have many great advantages in agricultural production. There can be little argument but that mechanization has helped people who live on farms and ranches to become better adjusted to the conditions under which they live. But mechanization of farming may also involve a critical or precarious situation. The large investment in machinery requires assurance of sustained agricultural production; and the threat of drought has not been removed or forestalled.

#### *Electricity and Telephones on Farms in South Dakota, 1930-1950.*

The number of farms which reported having electricity either from a power line or from a home plant, and the number of farms reporting telephones in 1930, 1940,

and 1950 are shown in Table 17. The table shows also the percent of all farms reporting electricity or telephones. It is readily observed that there has been a rapid increase in farms having electricity from a power line during the last decade. The number of farms having electricity from a home plant actually decreased from 8,864 to 8,405.

In regard to telephones on farms, there was a large decrease of nearly 20,000 between 1930 and 1940 and there has been an increase since then of about 12,000 farms. It is significant that a large proportion of farms (30.9 percent) did not have electricity; and that an even larger percentage (44.5 percent) did not have telephones in 1950. Because of the sparse settlement in the Great Plains, it is obviously difficult to build and maintain systems for telephone service and electric power distribution to farms and ranches. Consequently, there are distinct differences between the economic areas of the state in the proportion of farms which have electricity available from a power line or from a home plant, as well as in the extent of the use of electri-

<sup>9</sup>See Robert T. McMillan, "Effects of Mechanization on American Agriculture," *The Scientific Monthly*, Vol. LXIX, No. 1, July, 1949.

Table 17. Electricity and Telephones on Farms in South Dakota, 1930, 1940, and 1950

Electricity and Telephones	1930	1940	1950	Percent of All Farms		
				1930	1940	1950
All Farms .....	83,157	72,454	66,452	100.0	100.0	100.0
Farms reporting electricity .....	9,070	12,845	45,892	10.9	17.7	69.1
From a power line .....	2,534	3,981	37,487	3.0	5.5	56.4
From a home plant .....		8,864	8,405		12.2	12.6
Farms reporting telephones .....	44,608	24,821	36,850	53.6	34.3	55.5

Source: 1950 United States Census of Agriculture, Vol. 1, part 11, North Dakota and South Dakota, Table 7, p. 212.

cally operated equipment and the use of telephones.

The data which indicate these differences are shown in Table 18. The following points may be observed:

(1) The lowest proportion of farms having electricity is found in Economic Area 1b, Western Range Area (with Indian Reservations). The highest proportion of farms having electricity is found in Area 4b, the Southeastern Area. The respective percentage of all farms reporting electricity in these two regions were 35.7 percent and 84.4 percent.

(2) The lowest proportion of all farms having electricity from a power line is also found in Area 1b;

namely, 11.1 percent and the highest is found in Area 4b; namely, 78 percent.

(3) The proportion of all farms with electricity from a power line decreases from the eastern areas as one goes westward. As a general rule the proportion of farms and ranches having electricity from a home plant increases as one goes from east to west.

The proportion of farms and ranches which reported electric facilities of various types are also shown in Table 18. The facilities or types of equipment listed are: water pump, hot water heater, home freezer, washing machine, and chick brooder. Naturally there is a general positive correlation be-

Table 18. Farms Reporting Electricity, Specified Electric Facilities and Telephones in South Dakota, and by Economic Areas of the State, 1950

Facility	State	Area 1a	Area 1b	Area 2a	Area 2b	Area 3a	Area 3b	Area 4a	Area 4b
<b>All Farms</b> .....	<b>66,331</b>	<b>7,971</b>	<b>3,076</b>	<b>7,169</b>	<b>9,514</b>	<b>4,869</b>	<b>10,572</b>	<b>10,377</b>	<b>12,783</b>
<i>Electricity</i> .....	45,892	4,452	1,097	4,735	6,568	2,665	7,336	8,248	10,791
From power line	37,487	2,364	341	3,306	5,742	1,657	6,374	7,735	9,968
From home plant	8,405	2,088	756	1,429	826	1,008	962	513	823
<i>Electric facilities</i>									
Water pump .....	16,646	1,633	304	1,427	1,817	712	2,109	3,484	5,160
Hot water heater	7,223	727	121	536	1,030	259	869	1,314	2,367
Home freezer .....	6,136	524	175	541	975	215	963	1,083	1,660
Washing Machine	39,215	3,620	765	3,784	5,609	2,109	6,174	7,336	9,818
Chick brooder .....	4,245	637	76	260	465	112	283	727	1,685
<i>Telephone</i> .....	36,850	3,088	398	3,436	5,405	2,892	6,936	5,872	8,823
<b>Percent of All Farms Reporting:</b>									
<i>Electricity</i> .....	69.2	55.9	35.7	66.0	69.0	54.7	69.4	79.5	84.4
From power line	56.5	29.7	11.1	46.1	60.4	34.0	60.3	74.5	78.0
From home plant	12.7	26.2	24.6	19.9	8.7	20.7	9.1	4.9	6.4
<i>Electric facilities</i>									
Water pump .....	25.1	20.9	9.9	19.9	19.1	14.6	19.9	33.6	40.4
Hot water heater	10.9	9.1	3.9	7.5	10.8	5.3	8.2	12.7	18.5
Home freezer .....	9.3	6.6	5.7	7.5	10.2	4.4	9.1	10.4	13.0
Washing machine	59.1	45.4	24.9	52.8	59.0	43.3	58.4	70.7	76.8
Chick brooder .....	6.4	8.0	2.5	3.6	4.9	2.3	2.7	7.0	13.2
<i>Telephone</i> .....	55.6	38.7	12.9	47.9	56.8	59.4	65.6	56.6	69.0

Sources: 1950 United States Census of Agriculture, Vol. 1, Part 11. North Dakota and South Dakota, County Table 3 and Economic Area Table 5 (Part 1 of 2).

tween the extent of electricity on farms and the use of these electrical facilities.

The most common electrical piece of household equipment on farms and ranches in the state was the washing machine. It was found on nearly 6 of every 10 farms in the state. The use of this machine varies in frequency from about 25 percent of all farms in Area 1b to over 75 percent in Area 4b. The next item from the standpoint of frequency of use was the electric water pump. It was found on approximately 25 percent of all farms and ranches; but the range of this item is from less than 10 percent of farms in Area 1b to more than 40 percent of farms in Area 4b.

The chick brooder, which is a significant item in the production of poultry, was found most frequently on farms in Area 4b, the Southeastern Area of the state, and on farms and ranches in Area 1a, the ranch area west of the Missouri.

The use of electricity on farms and ranches in South Dakota appears to be primarily for household purposes. It is a recent development which implies a large and meaningful rise in the level of living.<sup>10</sup> This change occurred mostly during the last decade. The facts mentioned indicate the extent of the development which has occurred. They also show where development has been retarded. A large future development can presumably be expected in regard to the application of electricity to farm production and farm household uses.

### Area Aspects of Population Changes in South Dakota, 1930-1950

A recent publication of the South Dakota State College Agricultural Experiment Station entitled, "The Influence of Migration upon South Dakota's Population from 1930 to 1950," was concerned with two aspects of migration in South Dakota: namely, the migration from rural to urban areas and the interstate migration. The extent of net migration was determined on the basis of data pertaining to births and deaths. These are subject to careful registration. The number of births usually exceeds deaths and the excess is called natural increase. Since this natural increase is known so far as the state and its rural and urban areas are concerned, it can easily be determined how these areas were influenced by net migration.

One example of this method is presented for illustration: On April 1, 1940 South Dakota's population was 642,961 persons. During the decade from April 1, 1940 to March 31, 1950, resident births in the state totalled 145,142. Deaths during the 10 years numbered 56,328. The excess of births over deaths, or natural increase, would be 88,814 persons. Therefore, if there had been no migration from the state, the total population on April 1, 1950 should have been 731,775 persons. Instead, the census reported the population as 652,740 persons. It follows that a net migration from

<sup>10</sup>See Margaret J. Hagood, *Farm-Operator Family Level-of-Living Indexes for Counties of the United States, 1930, 1940, 1945, and 1950*, U. S. Department of Agriculture, Bureau of Agricultural Economics, Washington, D. C. May 1952.

the state of 79,035 persons took place.

The identical method was used to ascertain births, deaths, natural increases, and net migration with respect to the eight economic areas of the state as well as to the related state totals of the rural and the urban population which are presented in Tables 19 and 20.

Births and deaths and natural increase from 1940 to 1950 in the rural and urban population of the state and its eight economic areas are shown in Table 19. The average annual rates per 1,000 population are also shown and these rates call for some explanatory comment. It is quite significant, for example, that the *urban* birth rate and death rate both exceed the *rural* birth and death rate and that the rate of natu-

ral increase is also somewhat larger in the urban population than in the rural. It is also evident that Area 1b, the Western Range Area with Indian Reservations, has a much higher birth rate, death rate and rate of natural increase than the other regions. The same observation is true in a measure of Area 3a which also includes the larger part of the Brule Indian Reservation.

In Table 20 are presented the data which are needed to determine the extent of net migration to and from the region. The most conclusive general observation is that the state's rural population had a loss through net out-migration of 94,165 persons or 19.4 percent of the 1940 population; while the state's urban population *gained* 15,130 persons or 9.6 percent of its popu-

Table 19. Births, Deaths, and Natural Increase from 1940 to 1950 of the Rural and Urban Population of South Dakota, Tabulated According to Economic Areas of the State

Economic Area Number	Number of Births* 1940-1950	Number of Deaths 1940-1949	Natural Increase 1940-1950	Average Annual Rate Per 1,000 Population†		
				Births	Deaths	Nat. Incr.
<i>Rural Population</i>						
State .....	100,540	37,201	63,339	20.7	7.7	13.0
1a .....	15,332	5,648	9,684	20.9	7.7	13.2
1b .....	8,570	2,912	5,658	27.1	9.2	17.9
2a .....	10,732	3,547	7,185	21.3	7.0	14.2
2b .....	13,386	5,475	7,911	20.5	8.4	12.1
3a .....	8,288	3,078	5,210	22.0	8.2	13.8
3b .....	15,431	5,691	9,740	20.5	7.6	12.9
4a .....	13,057	4,692	8,365	19.9	7.2	12.7
4b .....	15,744	6,158	9,586	18.4	7.2	11.2
<i>Urban Population</i>						
State .....	44,602	19,127	25,475	28.2	12.1	16.1
1a .....	9,590	3,855	5,735	29.5	11.8	17.6
1b .....						
2a .....	2,199	916	1,283	30.0	12.5	17.5
2b .....	7,084	2,896	4,188	25.4	10.4	15.0
3a .....						
3b .....	2,528	1,406	1,122	23.8	13.2	10.6
4a .....	6,435	2,756	3,679	30.3	13.0	17.3
4b .....	16,766	7,298	9,468	28.7	12.5	16.2

\*Births (from April 1, 1940 to April 1, 1950) were adjusted for under-registration.

†Rural and urban populations were adjusted as stated in footnote under Table 2.

Table 20. Data Showing the Net Migration from the Rural Population and to the Urban Population, According to Economic Areas of South Dakota, 1940-1950

Economic Area Number	Population 1940	Natural Increase 1940-1950	Expected Population 1950	Actual Population 1950	Net Migration Number	Percent of Population 1940
<i>Rural Population*</i>						
State .....	484,874	63,339	548,213	454,048	-94,165	-19.4
Area 1a .....	73,521	9,684	83,205	71,889	-11,316	-15.4
Area 1b .....	31,565	5,658	37,223	25,994	-11,229	-35.8
Area 2a .....	50,497	7,185	57,682	46,796	-10,886	-21.6
Area 2b .....	65,393	7,911	73,304	60,562	-12,742	-19.7
Area 3a .....	37,678	5,210	42,888	34,882	-8,006	-21.2
Area 3b .....	75,192	9,740	84,932	71,590	-13,342	-17.7
Area 4a .....	65,635	8,365	74,000	60,350	-13,650	-20.8
Area 4b .....	85,393	9,586	94,979	81,985	-12,994	-15.2
<i>Urban Population*</i>						
State .....	158,087	25,475	183,562	198,692	15,130	9.6
Area 1a .....	32,555	5,735	38,290	43,521	5,231	16.1
Area 1b .....						
Area 2a .....	7,330	1,283	8,613	9,468	855	11.7
Area 2b .....	27,858	4,188	32,046	33,839	1,793	6.4
Area 3a .....						
Area 3b .....	10,633	1,122	11,755	12,123	368	3.5
Area 4a .....	21,221	3,679	24,900	26,316	1,416	6.7
Area 4b .....	58,490	9,468	67,958	73,425	5,467	9.3

\*Note: Rural and urban data totals were adjusted so that each category is in accord with the urban definition used in 1940 and so that the places listed as urban in 1950 are the same as included in the urban classification in 1940.

lation in 1940. As a rule, then, the rural areas of the state lost heavily through migration; while the urban population gained population to a considerable extent.

It is of interest to note the pronounced differences both as regards the migration *from* rural areas and the migration *to* urban areas so far as the regions or economic areas are concerned. The rate of out-migration from Area 1b greatly exceeded the rate of migration from the other regions.

The rate of urban increase through net migration was most extensive in Area 1a which includes Rapid City and other cities. The lowest rate of urban net migration occurred in Area 3b which includes Mitchell. In Area 2b which includes

Aberdeen and Huron it was also relatively small.

Two additional observations should be made: First, the rate of natural increase shown in Table 19 indicates the extent to which the population of the regions might have increased during the decade from 1940 to 1950 if no migration had occurred. Secondly, the net migration from the rural areas greatly exceeded the natural increase in this population group; but the net migration to urban areas was added to the natural increase. As shown in Table 4 the total increase of the urban population from 1940 to 1950 (on the basis of adjusted rural-urban data) was 25.7 percent, which is the sum of the rate of natural increase and the rate of net migration.

## Main Aspects of Water Resources Development in South Dakota

IN RECENT YEARS, several wide-spread and damaging floods have occurred in various parts of the Missouri River Basin. The damage which they caused was so extensive that it became convincingly evident that the problem of flood control was of such magnitude that it was far beyond the capacity of local communities, both physically and financially, to cope with it. It became evident that large scale reservoirs were necessary in order to impound the immense volume of flood waters and prevent the damage they brought in their wake.

It was also recognized that to safeguard the Nation's investment in these great dams and in order to prevent soil erosion and siltation of the reservoirs, numerous small farm ponds and stock-watering ponds, terraces, contour farming, grassed waterways, and other conservation practices were also necessary.

### Recent Floods and Flood Control

The flood on the main stem of the Missouri River in April 1952 was probably the largest and most destructive in the history of settlement in the Missouri Valley so far as Iowa, Nebraska, and South Dakota communities were concerned. It was caused almost entirely by run-off water from melting snows. Heavy snowfall had accumulated over the plains of the Dakotas and Montana during the preceding winter months. Warm temperatures in early April caused the snow to melt rapidly. The frozen ground under the snow was unable to absorb water by percolation into the sub-soil. Floods were caused also on the western tributaries to the Missouri, on the James River, on the Big Sioux and Little Sioux Rivers, and other streams. Extensive damage

was caused to city property, railroads, industries, public utilities, and stockyards, as well as to farm property in the valley. Cities on the Missouri and its tributaries, such as Pierre, Fort Pierre, Chamberlain, Vermillion, Sioux City, South Sioux City, and many other places farther downstream were inundated wholly or partly and hundreds of residents had to be evacuated. The crest of this enormous flood passed Bismark, North Dakota on April 6, Pierre, South Dakota on April 10, and Sioux City, Iowa on April 14, 1952.<sup>11</sup>

Estimates of the amount of damage caused by this flood were made by the Corps of Engineers, Department of the Army. These estimates pertained to cities and localities in South Dakota and Iowa and Nebraska, and the damages were classified under three columns: residential, business and industry, and other. The last classification includes flood damages to railroads, municipal water and light plants, streets and sewers, and cost of evacuation. The damages caused at

<sup>11</sup>Based on data from an address by Colonel H. J. Hoefler, District Engineer, Corps of Engineers, Omaha, Nebraska entitled "The Missouri River Flood, April 1952."



Table 21. Estimated Damage Caused by Flood at Cities in South Dakota, Iowa, and Nebraska April 1952

City	Residential	Business and Industry	Other	Total
Pierre, S. D. ....	\$ 473,000	\$1,037,500	\$ 127,300	\$1,637,800
Fort Pierre, S. D. ....	799,000	473,500	66,000	1,338,500
Fort Thompson, S. D. ....	43,900	8,400	600	52,900
Chamberlain, S. D. ....	0	153,000	19,600	172,600
Wheeler, S. D. ....	2,600	2,800	0	5,400
Yankton, S. D. ....	21,700	13,800	6,900	42,400
Vermillion, S. D. ....	3,200	1,200	3,900	8,300
Elk Point, S. D. ....	2,400	6,200	0	8,600
Stevens, S. D. ....	115,400	17,800	4,600	137,800
McCook Lake, S. D. ....	115,000	2,400	0	117,400
Sioux City, Ia. ....	441,100	2,677,100	142,600	3,260,800
Onawa, Ia. ....	76,500	61,400	88,500	226,400
Hamburg, Ia. ....	225,300	69,400	73,600	368,300
South Sioux City, Nebr. ....	882,100	355,200	505,600	1,742,900
Total .....	\$3,201,200	\$4,879,700	\$1,039,200	\$9,120,100

Source: Letter dated April 29, 1953 from Ryamond G. Leonard, Technical Information Branch, Omaha District Office, Corps of Engineers, Department of the Army.

these places totaled \$9,120,100 (Table 21).

#### **Federal Government Participation in Flood Control**

The first major participation by the Federal Government in flood control was authorized by an act of March 1, 1917. According to the provisions of this act, the Corps of Engineers under the supervision of the Secretary of War, was authorized to carry out plans for flood control on the Mississippi River.

Local interests were required to furnish rights of way for the improvements and to contribute financially toward the cost of construction, not less than half the amount spent by the Federal Government. In 1928 Federal legislation recognized that the cost of flood improvements was so great that it was impractical to require the local interests to contribute financially to the extent mentioned. It was therefore provided that future projects for

flood control were to be made at Federal expense, except that local interests were still required to provide rights of way, easements, and lands necessary for the construction of the contemplated projects.

In 1925 Congress authorized the Corps of Engineers and the Federal Power Commission to estimate the cost of investigations and surveys of navigable streams and their tributaries where power development appeared feasible. Formulation of general plans for the most effective improvement of these streams for navigation, power development, flood control, and irrigation was to be considered. An estimate was made and published in House Document No. 308, Sixty-Ninth Congress, first session. In 1927 the Corps of Engineers was authorized by the Congress to undertake a series of investigations listed in House Document No. 308. The reports that were issued covered major river systems of the United

States, including the Missouri and its tributaries, and became known as "308 reports."

Federal participation in flood control received its greatest impetus from the Flood Control Act of June 22, 1936. More than 200 individual projects throughout the United States were authorized, many of them based upon plans prepared for the "308 reports."

In this Act, for the first time, the Congress specifically set forth the policy that flood control on the navigable streams of the United States and their tributaries is a proper activity of the Federal Government in cooperation with the States and their political subdivisions, and that the Federal Government should participate in the improvement of these streams for

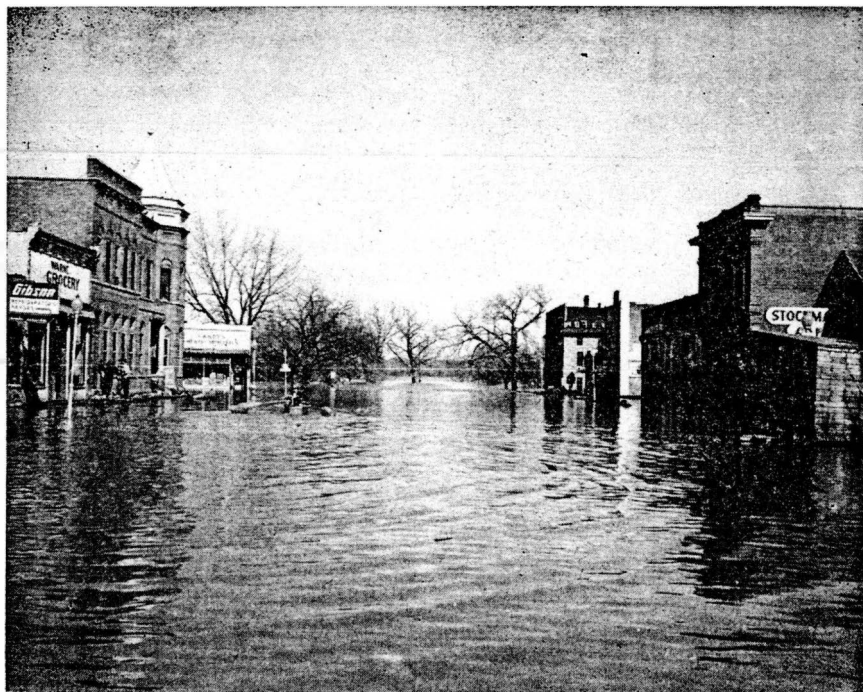
flood-control purposes; and it established the criteria under which the Federal Government would so participate.<sup>12</sup>

### **Dams and Reservoirs on the Missouri Main Stem**

The Flood Control Act, approved December 22, 1944, authorized the Pick-Sloan plan for projects to be planned and constructed. This was to be done partly by the Corps of Engineers, Department of the Army; and partly by the Bureau of Reclamation, United States Department of the Interior. According to this law and subsequent laws and appropriation acts, three dams in South Dakota are now under con-

<sup>12</sup>Corps of Engineers, Omaha District, *Floods and Flood Control: A Brief General Discussion*, pp. 9-10.

**Flood waters in the business district of Fort Pierre, South Dakota, April 1952**



struction by the Corps of Engineers—the Fort Randall Dam, the Oahe Dam, and the Gavins Point Dam. A fourth dam, to be located on the Big Bend east and south of Pierre, South Dakota, is still in the planning stage.

### *The Oahe Dam and Reservoir.*

The Oahe dam has been under construction by the Corps of Engineers since 1948. It is located on the Missouri River about 6 miles north of Pierre, the capital of South Dakota. The reservoir which will be created above the dam will have a shoreline of more than 2,350 miles. It will create a great inland lake which will extend about 250 miles upstream, almost to Bismarck, North Dakota. The lake's surface area at full operating level will be 376,000 acres.

In regard to the uses of the Oahe reservoir waters, the document, *Water Resources Development by the Corps of Engineers in South Dakota*, makes the following statement:

At full capacity Oahe Reservoir will hold 23,600,000 acre-feet of water, of which 3,500,000 acre-feet will be set aside for seasonal and exclusive flood control. During periods of water shortage, water for irrigation, power, navigation, and other beneficial uses will be drawn from the 14,600,000 acre-feet of joint use storage and the remaining 5,500,000 acre-feet will provide a pool for power head and sediment reserve.

With this large conservation pool set aside in Oahe, the silt laden Missouri will have little effect on the project's life expectancy for several centuries. Engineering studies show that with Oahe in operation, even the downstream dams will last hundreds of years before silting substantially interferes with their functions.

In years with normal runoff, the pool fluctuation will vary only about 7 feet.

Should drought conditions of the 1930's recur, the reservoir could be drawn down another 70 feet. Normal fluctuations will be such that the maximum pool elevation will be reached during the June rise and the lowest elevation during the winter months.

*The Fort Randall Dam and Reservoir.* The Fort Randall Dam was the first of the main stem projects to be authorized and started under the Flood Control Act of 1944. Construction was begun in 1946, and the dam and related structure are well on the way toward completion. Benefits from the project arising from flood control, power production, and conservation have been estimated to average over \$14,000,-000 annually.

The Corps of Engineers estimate that the Fort Randall Dam operating along with the Garrison Dam in North Dakota, the Oahe and the Gavins Point Dams in South Dakota, and the levees along the Missouri main stem, will provide protection from Missouri River floods. It will generate quantities of low cost power which is being made available in South Dakota and adjoining states. The lake will make good fishing and hunting possible, and many forms of out-door recreation can be developed.

*The Gavins Point Dam and Reservoir.* The construction of the Gavins Point Dam was begun in the spring of 1952. It spans the river valley a few miles west of the city of Yankton. The dam and reservoir are an integral part of the main stem system of flood control projects and one of its chief functions will be to smooth out the pulsating discharges

caused by power generating at the Fort Randall Dam.

### Coordination of Multiple Purposes of Water Resources Projects

The projects on the main stem of the Missouri River involve a number of general public purposes such as to provide water for irrigation, generating hydro-electricity, municipal water supplies, improved navigation, recreational areas and facilities, and for fish, fowl, and game habitats. The use made of the impounded waters for flood control, irrigation, or hydro-electricity will to some extent affect the uses of water for all the other principal purposes. The several purposes will, therefore, need to be coordinated and managed jointly so that maximum benefits may be realized.

Each of the multiple purpose reservoirs on the main stem of the Missouri River will be operated in coordination with other reservoirs of the system to regulate the natural widely varying flow to the requirements of flood control and allied beneficial uses. Excess water impounded during floods and periods of abundant natural stream supply will be put to useful purpose whenever it may be safely released. During the several seasons of each year water will be stored in such a manner as to adjust the natural flow to the beneficial uses during that year. This seasonal plan of operation will be adjusted to conform to a long range program, planned to accumulate natural stream flows during wet years, and to hold this excess water for drought years, when it will be drawn out of the reservoir to supplement the deficient natural water supply of those years. A similar plan of operation will be used for multiple purpose reservoirs on tributary streams.

The Corps of Engineers is authorized to construct, operate and maintain public park and recreational facilities on project

lands, or it can permit these functions to be performed by others.<sup>13</sup> In accordance with this responsibility, a master recreation plan for recreational and related development at each Corps of Engineers reservoir is now being prepared or will be studied when project planning is initiated. The advice and assistance of federal, state, and local government agencies and other interested parties is obtained in preparing these plans, in developing recreational facilities and in protecting and managing the fish and wildlife resources.<sup>14</sup>

### Water Resources Projects under the Bureau of Reclamation

The Bureau of Reclamation was established as the Reclamation Service by Act of Congress on June 17, 1902. It is the Federal Government agency which is in charge of the planning, construction, and development of public facilities and installations related to irrigation and allied purposes in the western states.

Irrigation is the primary objective of the activities of the Bureau. But the development of hydro-electric potentialities of western streams is another main objective. Power is produced in order to get the greatest economic benefits from the reservoir waters. Large amounts of electrical energy are often required for the operation of irrigation projects and the sale of hydro-electricity produces revenues which help repay the cost of the projects.

Another public purpose of great importance is the storage of municipal water supplies. The reservoirs of many projects also involve flood and

<sup>13</sup>Italics by the author.

<sup>14</sup>Corps of Engineers, Department of the Army, Missouri River Division, Omaha, Nebraska, *The Development and Control of the Missouri River*, p. 13. (Dec. 1947.)

sedimentation control and lend themselves to the enhancement of recreational facilities, improvement of fish and wildlife habitat, and stream pollution abatement.

The scope of the activities of the Bureau of Reclamation includes the Missouri River Basin Project, authorized by the Flood Control Act for 1944, with the subsequent modifications and revisions. There is also a program for the improved operation, maintainance, and rehabilitation of irrigation projects constructed or authorized before the passage of the Act (see Fig. 7).

The Missouri-Oahe District of the Bureau of Reclamation, whose administrative office is located at Huron, South Dakota, includes nearly all of South Dakota. It includes also adjoining parts of Wyoming

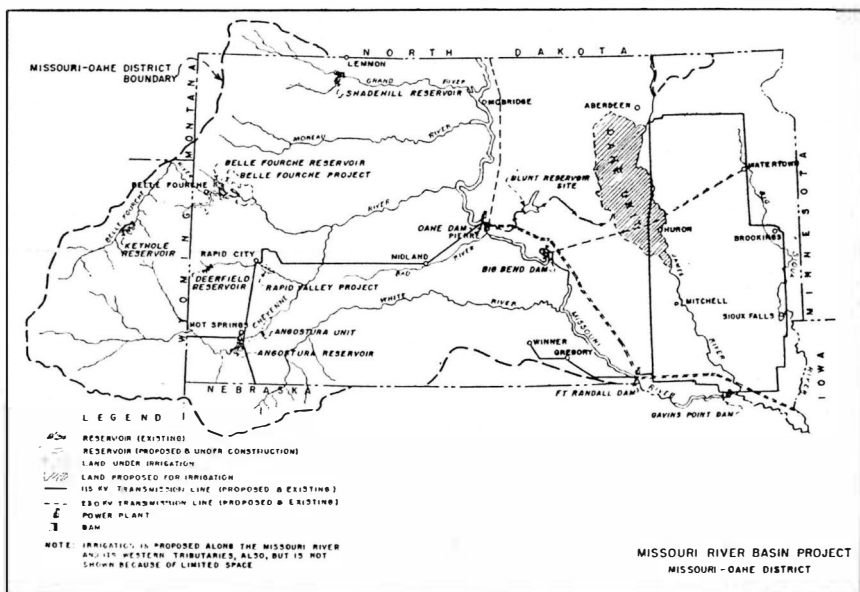
and Nebraska lying in the drainage basins of the Belle Fourche, the Cheyenne, and the White rivers.

### Irrigation Development in Western South Dakota

*The Angostura Dam and Reservoir* was completed December 7, 1949. There is a power plant at the base of the dam with an installed capacity of 1,200 kilowatts. Power will be distributed by the Black Hills Power and Light Company under a contract with the Bureau until such time as the Bureau coordinates the Angostura plant with its Missouri Basin power transmission grid.

The Angostura Irrigation District has been organized and negotiations between the district and the Bureau of Reclamation on a water-users contract were completed in

Fig. 7. The location of water resources projects in South Dakota





Angostura Dam and Reservoir, Hot Springs, South Dakota

December 1950. The contract was signed in 1951. Construction of canals and other irrigation works are completed. Land development and construction of farm ditches and drains are scheduled for completion in early 1955. Irrigation water was delivered to approximately 3,000 acres of land in 1953 and it is anticipated that the entire 12,150 acres will receive the water in 1955.

*The Deerfield Dam and Reservoir* is located on Castle Creek in Pennington County. Construction of this dam was completed in 1943. During the irrigation season, the water of this reservoir will be used to replace municipal water taken from springs near Rapid Creek by

Rapid City. Water from this reservoir also helps to stabilize the water supply of present irrigated lands and is a source for a limited supplemental water supply for the irrigated land in the Rapid Creek valley east of Rapid City.

*The Pactola Dam and Reservoir* is now under construction. It will have a reservoir capacity of 99,000 acre-feet. The water from this reservoir will be used in conjunction with water from Deerfield reservoir for municipal water, irrigation, and water for the Air Force Base east of Rapid City.

*The Keyhole Dam and Reservoir* which is located about 17 miles

northeast of Moorcroft, Wyoming is a multipurpose dam to provide flood protection along the Belle Fourche River in Wyoming and South Dakota and a supplemental water supply for the Belle Fourche project's 56,000 irrigable acres. It is also a possible source of municipal water for the city of Belle Fourche, South Dakota.

*The Shadehill Dam and Reservoir* is located on the Grand River, near Lemmon, South Dakota. It was completed in most respects in December 1950. It has a storage capacity of 358,000 acre-feet of water. This large reservoir provides for flood control, silt control, and municipal water storage for Lemmon in addition to a water supply for irrigation.<sup>15</sup>

*The Belle Fourche Project* is located in Butte and Meade counties north of the Black Hills in western South Dakota. This is one of the early projects developed under auspices of the Reclamation Service. It was started by a survey party in 1904. Bids to construct facilities were opened in October 1905, and work was started on the dam in 1906 and completed in 1911.

The project includes the following structures and facilities; (1) A concrete diversion dam on the Belle Fourche River 2 miles below the city of Belle Fourche; (2) a canal  $6\frac{1}{2}$  miles long conducting diverted water to the reservoir; (3) the Belle Fourche Reservoir with a storage capacity of 192,000 acre-feet; (4) an earthen dam 6,262 feet long and 122 feet high lying across the Owl Creek

valley, about 6 miles north of Fruitdale, South Dakota. Two main canals conduct water to the district irrigated lands. The South canal is 44 miles long. The North Canal is 43 miles long. There is a total of 662 miles of canals and laterals for the distribution of irrigation water and 236 miles of drainage ditches.

Irrigation was started when the first unit was opened for settlement in 1907. The fifth unit was opened for settlement in January 1917. During the dry 1930's the project experienced several years of water shortage, 1 year having as low as 6 inches per acre. The original project was designed to cover 81,870 acres. But in 1926 the irrigable acreage was reduced to 72,431 acres. In 1945-48 the irrigated land was re-surveyed and reclassified. At present, 59,129 acres are on the irrigation assessment roll and 3,500 acres are classified as being land of doubtful irrigability. An additional 9,802 acres are classified as not suitable for irrigation.

When the survey was completed in 1948, a new repayment contract was made between the Bureau of Reclamation and the Belle Fourche Irrigation District. This contract removed the old joint liability clause from the landowners and made the irrigation district as a whole liable to the United States for the repayment of construction charges. The annual payment for construction (spread over 67 years) amounts to \$38,700.

<sup>15</sup>The principal source used for the description of water resources is the booklet, *Missouri River Basin Project in the Missouri-Oahe District*, Bureau of Reclamation, Region 6, Billings, Montana.

From 1923 through 1948, the Bureau of Reclamation operated the project on behalf of the Irrigation District. But on January 1, 1949, the Irrigation District took over the operation of the project and is operating it at present.

The value of crops produced in 1949 was estimated at \$2,095,000 or \$40 per acre. The value of livestock produced that year was estimated to be \$3,726,000.

The number of farms on the project has been reduced over the past 20 years as shown by the following statistical data:

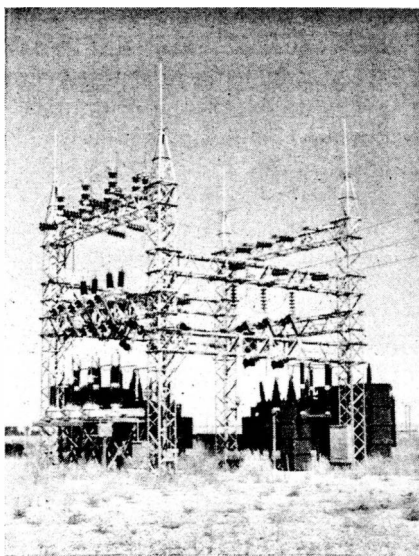
Number of Farms and Tenure	Year		
	1932	1942	1952
All farms .....	494	469	410
Owners .....	214	238	333
Tenants .....	280	231	77
Farm population on all farms .....	2,579	2,139	1,768

Irrigation on these farms is to a large extent integrated with dry-land farming and ranching.

### **Irrigation Development in Eastern South Dakota**

The Bureau of Reclamation contemplates the irrigation of some 750,000 acres in the James River Valley in eastern South Dakota. These lands and the pertinent facilities are referred to as the Oahe Unit. The irrigable areas extend southward from Aberdeen to near Woonsocket, South Dakota. Water for irrigation will be provided by pumping from the Oahe Reservoir on the Missouri River.

The Oahe Dam is now being constructed by the Corps of Engineers. From the pumping plant the irrigation water will flow through a canal



**Take-off structure for the REA  
co-operative lines at  
Huron substation**

to a regulating reservoir located near Blunt, South Dakota. From this reservoir a canal will carry the water to the irrigable lands. At the end of the main canal 26 miles west of Huron, South Dakota, a power plant is planned which will utilize a waterhead with a drop of about 240 feet to generate electricity at a plant having an installed capacity of 180,000 kilowatts. This power will be used to compensate for power used for the pumping from the Oahe Reservoir. From this power plant canals will run north and south to serve irrigable lands in the valley.<sup>16</sup>

<sup>16</sup>Bureau of Reclamation, *Missouri River Basin Project in the Missouri-Oahe District*, p. 8. The original description of the Oahe Unit, the Big Bend Dam and power plant and the Fort Randall Dam and power plant appears in *Senate Document No. 191, 78th Congress, 2nd Session, Missouri River Basin*, April 1944. This document is a report by former Secretary of the Interior, Harold L. Ickes on the Bureau of Reclamation's plan for basin development.



### **Transmission of Hydro-Electric Power**

The Bureau of Reclamation is charged with the responsibility of marketing and transmitting power produced at multipurpose dams constructed by the Federal Government on the main stem and tributaries of the Missouri River. In order to market power generated at these plants, an extensive system of high-tension transmission lines interconnecting the power plants and extending from the plants to major load centers will be required.

Work has been virtually completed on the 520-mile 115-KV "East River" power loop. It is anticipated that the 115-KV line from Fort Randall to Gregory and Winner, South Dakota; a line from Oahe Dam to Rapid City; and another line from Fort Randall to the "East River" power loop will be completed by the end of 1953. The 208-mile main grid backbone 230-KV line from Fort Randall to Mobridge and the 122-mile 230-KV line from Fort Randall to Sioux City are both under construction and scheduled for completion by April 1955.

## **Conclusions and Summary**

**D**URING THE PAST 20 years, beginning with the critical social-economic situation of the early 1930's and closing with the prosperous conditions in the spring of 1950, several alternative policies were proposed regarding population adjustment and resources development. As public policies, they were by no means clearly defined. Many of them were not consistent with one another as to goals and the courses of action that were adopted were in many cases ineffective.

### **Larger Alternatives of Population Adjustment or Resources Development**

*A redistribution of population.* Migration from the stricken areas was generally regarded as one possible solution. An extensive migration from the state, particularly to the west coast, and from rural to urban areas in the state did take place. It was mostly unassisted migration, but assisted migration which helped some families move from submarginal areas and settle elsewhere was one of the objectives of the Resettlement Administration. Directly or indirectly the depression and the drought also had other

population consequences such as smaller families and postponed marriages.

*Acceptance of lower levels of living.* Many courses of action taken by the people who had to adjust to greatly reduced incomes and unproductive resources, but who nevertheless chose to remain in their communities, implied the acceptance of lower levels of living, at least for the time being. One might almost say the people developed a mentality of drought resistance. It is evident in a very general willingness to accept risks and gamble on the future. If the

crops fail "this year," they may turn out to be bumper crops "next year." The people used up their reserves to tide themselves over the emergency. They used credit or other private assistance they could obtain. They got along without many new comforts and conveniences, and curtailed expenditures by living on the basis of greater self-sufficiency.

*The provision of public assistance by the local, state, and Federal governments.* In 1930, practically all relief and public assistance was locally administered and locally financed. There was a rapid increase in relief loads which placed an impossible burden on local finance. In March 1933, the Federal Government began taking the responsibility for many types of direct relief and work relief. On August 14, 1935, the Social Security Act became law. In conformity with the provisions of this Act, the state of South Dakota during the late thirties enacted laws to provide public assistance for dependent children, needy aged and blind persons, unemployment compensation, and other types of public assistance and welfare services. In addition, the Social Security Act also established a national contributory old-age retirement and annuity system for workers in industry and commerce. In cooperation with local and state governments, the Federal Government also established an administration of public works projects to provide employment for the unemployed.

This policy, which may be briefly

described as resources supplementation, was adopted on a large scale. The public works projects that were brought about were in many cases related to the protection and development of the state's natural resources and were justified on that basis as well as on the basis of the need for employment.

*Resources development, conservation, and restoration.* Examples of these are the prevention of soil erosion, the shifting of marginal agricultural lands back to grass, the conservation of natural precipitation, and the development of small water facilities and impoundments. Gradually a still more positive national policy of resources development on a large scale was adopted.

In December 1944, the Congress of the United States passed the Flood Control Act which authorized comprehensive plans for public works in the Nation's river basins. Subsequent appropriation acts were passed which financed projects to provide flood control, irrigation, navigation, municipal water supplies, hydro-electric power, and other general public benefits. The development of means to cope with natural disasters, such as floods and drought, took the place of the earlier policy which sought to mediate the effects of such disaster. A new resource which had hardly been used before—the destructive, muddy, untamed waters flowing through South Dakota in the Missouri River and its tributaries—is now being harnessed in the service of the state and the Nation.

### **Population Trends**

It is difficult to project the curve of South Dakota's population into the future. The course of its population was rapidly upward until 1930. Since that time it has fluctuated downward to a low point in 1945, upward again during the post-war years.

The year 1930 appears to have been a turning point in the state's population history, but there are more recent turning points indicating the beginning of what may be new trends. The most important of these, undoubtedly, is the upsurge of the birth rate since 1940 along with the change in the ratio of children under 5 per thousand women 15 to 44 years of age. This recovery of the rate of population increase has, however, been more pronounced in the urban population than in the rural. It is one of the principal reasons why the state may expect a growing population in the near future.

It is likely that the urban population of the state will continue to increase, partly because of its high rate of natural increase, partly because of in-migration from rural areas, and partly because of an increase in the number of places of urban rank and increase of their territory by annexation.

The rural-nonfarm population will probably show a fairly stationary level. Losses in some of its elements will be offset by increases in others. There is likely to be a distinct increase of residents in suburban areas and of scattered nonfarm families. Many small trade centers

will continue to decline; but other places may be strengthened by developing new service functions in place of those that were discontinued. Rural-nonfarm population centers occupy a strategic "midway" position between the urban and the farm population. Services such as those related to marketing, highway transportation, tourists, recreation; and, generally speaking, services related to an increasing mobile population are likely to be much in demand. These services the rural-nonfarm population is in a position to provide.

The farm population has undergone a rapid as well as an extensive decrease. This decrease accounts for the greater part of the state's population decrease. The displacement of labor by mechanization, tractor power, and electrification has probably not reached its maximum. But it is likely that the rate of displacement will decrease in the future.

In 1950, male resident employees and lodgers were far less numerous than they were 10 years ago. To some extent employment has been shifted away from farms and ranches as evidenced by the fact that employment in agricultural occupations increased to a marked extent on the part of urban and rural-nonfarm residents from 1940 to 1950.

The steady trend over the decades toward older farm families has been one of the causes of smaller families and households and, consequently, a decreasing farm population. It is also possible that on many farms and ranches father and son

partnerships might be arranged so that two families rather than one would be situated on the same place.

### **The Need for Resources Development in South Dakota**

In the previous study of "The Influence of Migration upon South Dakota's Population, from 1930 to 1950," it was pointed out that migration from the state occurred largely because young people were looking for jobs and for professional openings. A resources development program could tend to bring about a better balance between job vacancies and job seekers.

In the present study it has been made evident that there are still other grounds for a program of resources development. It may: (1) make migration unnecessary to some extent; (2) stabilize, assure, and increase agricultural production; (3) help maintain and improve the present levels of living in many areas of the state.

The role of the climatic factor in agricultural production has been indicated and explained. In the central part of the state natural precipitation is frequently inadequate to assure satisfactory crops, and the threat of prolonged drought is ever present.

Farms and ranches in South Dakota have become heavily mechanized. To a large extent they have acquired tractors, motor trucks, combines, corn pickers, and other pieces of machinery during the past two decades. These machines represent a large investment. Farms are now more dependent upon produc-

tion for sale than when more self-sufficient. Both of these observations indicate a greater need for resources development which will assure sustained farm production. The increase in the land-base of many farms and ranches in the western regions is a salutary trend.

To argue for a population increase in the state (except insofar as indicated above) has little merit *unless it is accompanied by assurance of adequate standards and levels of living*. Upon this point, the table showing the extent to which the farms and ranches of the state are equipped with electricity, electrical equipment, and telephones has the most merit. These data are indicative of a rapid improvement in household comforts and conveniences. But in some regions, in fact in most of the state, there is still a large proportion of farms which do not have these modern conveniences. Rural electrification has made outstanding progress during the post-war years; but all indications are that the present extent of the use of electricity is only a beginning. Large-scale production of hydro-electricity is called for to serve this potential need.

If prolonged droughts are a threat to the agriculture of the state, they are also a threat to the commercial and industrial activities of the state. In the analysis of the net migration as it affected the population of the economic areas of the state for 1940 to 1950, it was shown that the rural population sustained a large loss of population through out-migration. But it was also

shown that while the urban population increased because of net in-migration, in the James River Valley areas net urban in-migration was much smaller than for the state as a whole. In these areas, the urban birth rate as well as the rate of natural increase was also smaller than in other urban areas of the state. The nonfarm population in these regions increased less than the overall statewide increase.

Irrigation is not new in South Dakota; but it has reached only a small development and practically all of the irrigated lands of the state are situated in Butte, Custer, Fall River, Lawrence, Meade, Pennington, and other counties west of the Missouri River. The 1950 *Agricultural Census* reported 807 irrigated farms in the state and the total area of irrigated land in farms as 78,069 acres. This is about 0.2 percent of the land in farms and ranches. As compared with the 17 western

states, South Dakota ranks fifteenth—only Oklahoma and North Dakota have a smaller development of irrigation.

Successful irrigation depends upon a combination of several necessary factors and conditions. It requires lands having appropriate soils, topography, and drainage. It requires an adequate water supply obtained at a cost low enough to reward the farmer who chooses to irrigate rather than to continue dry-land farming and ranching. Irrigation must be economically advantageous. It must also be borne in mind that as irrigation is developed in the eastern parts of the Great Plains, it enters an area of long-established farming. It enters an area where irrigation is an optional development. But one feasible adjustment to droughts in the James River Valley seems to lie in the development of irrigation.