

SOME DEMOGRAPHIC, SOCIAL AND ECONOMIC
ASPECTS OF PRAIRIE FARMERS

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INTRODUCTION

It has been almost a century since one prominent author wrote: "The population of a country assuredly constitutes the first element of its wealth."¹ This is true of a young country with abundant natural resources.

The importance of people as a basic element in national resources has been well illustrated by the period of settlement of the Prairie Region during the first three decades of this century. Towards the end of this period wheat grown in the settled area has become the single most important commodity in Canadian exports.

The whole period of the last sixty years can be divided into two parts; one from the beginning of the 20th century to the "Great Depression" and the other from the latter event till present times. The first part is characterized by large population movements in the form of great migration waves, by the "breaking up" of virgin lands in the Prairies and by the general adjustment of settlers, (mostly immigrants from Europe) to new conditions. In the second part, immigration - at least as it affected the rural population - came virtually to an end, and the great farm consolidation and mechanization movements which made a deep

¹ A. de Tockeville, Democracy in America, Toronto, McClelland, 1954, 465 p.

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imprint in the Prairie farm economy, set in.

This was the reason for selecting the period of the last thirty years or so for the following analysis.

During these years Canada has experienced an unprecedented industrial expansion. Within these years the number of manufacturing establishments increased by more than 50 percent and the total number of industrial workers by more than 100 percent. By the end of the second World War manufacturing industries alone were employing over one million workers, or more than a quarter of the labour force.

Even more spectacular changes took place in Canadian agriculture. Technological progress increased efficiency, improved productivity and vastly reduced agriculture's dependence upon manpower, thus releasing workers for employment in growing industry. As a result of these developments, Canada has become a predominantly industrial and urban society.

Changes in the organization of agriculture occurred first and with greatest effect in the Canadian Prairies. They can be summarized in three main categories. First, there has been a decline in the number and an increase in the size of farms. This consolidation of Prairie farms was necessary to adjust to machine farming. Second, an intense farm mechanization process took place, substituting machinery for farm labour. Third, scientific farming developed to an

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extent unheard of before, where improvements in seed, livestock breeding, and pest and disease controls were quickly taken advantage of by farmers. These developments, which constituted an agricultural revolution, resulted in the region producing about half of the total farm cash income in Canada, employing about 40 percent of Canadian agricultural labour and growing about 95 percent of all the grain produced in Canada.

In this study an attempt has been made to describe analytically all these changes. The study itself is divided into four chapters. The first chapter deals with demographic changes. The human factor is important in economic analysis, and the knowledge gained as a result of such analysis will be used to support some statements made in the following chapters. In the second chapter observations are included which are designed to bring out the main developments in farm organization and their effects on the region's agriculture. The third chapter is concerned with the economic status of the farmer. The fourth, and last chapter contains final conclusions and describes how far, if at all, the farmer has progressed since Great Depression days, what impact the technological revolution has had on him, and what further developments can be expected.

CHAPTER I

DEMOGRAPHIC AND SOCIAL CHARACTERISTICS
OF FARM POPULATION

A. ANALYSIS OF FARM POPULATION SINCE 1931

1. General Population Growth

The first official census in Canada was taken in 1851, but of the Prairie Provinces only Manitoba was included and coverage there was partial. Full coverage for the Prairie Region starts only with the 1901 census.

With the beginning of the third decade of the 20th century the last wave of settlement in the Prairies came practically to an end. From then on a more orderly growth of population has ensued. The extent of this growth is illustrated in Table I.

The rate of increase in population over the last thirty years has by no means been even. It was lowest between 1931 and 1941 (the annual average being .3 percent) and highest in the decade 1951-1960, when it reached 2.1 percent on an annual average basis. Over the whole period under discussion the total increase amounts to approximately 31 percent, or about 1 percent per year, on average. An interesting fact to note is that for the region as a whole net migration has been negative, except for the 1951-1956

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TABLE I

Prairie Provinces - Growth of Population
(1931-1960)

(in '000s)

Items	1931-1940	1941-1950	1951-1960 ¹
Population at the beginning of each decade	2,354	2,422	2,548
Natural increase	316	393	523
Net migration	248	237	21
Actual increase	68	126	544
Percent increase	2.9	5.2	21.4

Source: D.B.S., Census 1951, Vol. X, p. 36,
1956, Vol. 1, p. 101.

¹ Population in 1960 is estimated at 3,092,000.
Changes are unpublished estimates.

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years. The growth, then, was due entirely to the natural increase.

On a provincial basis, the largest population growth occurred in Alberta. From 732,000 in 1931 population increased to 1,283,000 in 1960, which represents a 60.5 percent increase, or average annual rate of 2 percent. The main factor behind this rather spectacular expansion was the formation and development of the oil industry. Saskatchewan, at the other end of the scale, lost 12,000 persons between 1931 and 1960 because the natural increase was not sufficient to make up for the losses due to heavy emigration.

2. Trends in Farm Population

Within the general growth of population there has been a very clearly marked trend in redistribution from rural to urban population.

The redistribution trend of Prairie population as between rural and urban is illustrated in Table II, from which the full extent of the urbanization process in the region can be realized. This progress of urbanization has not affected all three provinces to the same extent. Considerable variations among the provinces in the rate of urban growth are reflected in the distribution of rural and urban population groups during the whole 1931-1956 period. Manitoba proved to be the most urbanized province both at

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TABLE II

Percentage Distribution of Population
by Rural² and Urban³ Groups
(1931-1956)

		1931	1941	1951	1956
Prairie Provinces	Rural	67.8	66.2	55.2	48.5
	Urban	32.2	33.8	44.8	51.5
Manitoba	Rural	51.1	50.7	43.4	39.0
	Urban	48.9	49.3	56.6	60.1
Saskatchewan	Rural	79.7	78.5	69.6	63.4
	Urban	20.3	21.5	30.4	36.6
Alberta	Rural	68.9	66.6	52.0	43.4
	Urban	31.1	33.4	48.0	56.6

Source: D.B.S., Census 1951, Vol. X, p. 51, 1956,
Vol. 1, p. 101.

² Persons living in rural areas, i.e. places of less than 1,000 pop. whether incorporated or not, (1956 Census definition).

³ Persons living in urban areas, i.e. places of 1,000 or more, whether incorporated or not.

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the beginning and at the end of the period, although the rate at which the urban group was gaining at the expense of rural was only 11 percent, the smallest of all the provinces. The process of urbanization was most radical in Alberta. During the period in question, the rural population declined by 25 percent, while urban population increased by 26 percent.

This difference between provinces in the rate at which urban population has been gaining at the expense of rural population can be explained by the uneven pace at which industry developed within the whole region. Manitoba enjoyed the advantage of being a hinterland of Winnipeg, the largest grain trading centre in Canada, and the Fort William-Port Arthur Great Lakes shipping centre. Alberta experienced a tremendous outburst of industrial activity with the discovery of oil bearing fields. Saskatchewan, on the other hand, had very little to offer by way of incentives to bring in industry. It is true that the farm consolidation movement, which started earlier in Saskatchewan than in the remaining two provinces, released labour which sought employment outside farming, but Manitoba and Alberta seem to have attracted most of it, as is shown by a heavy out-migration (negative net migration) from Saskatchewan.

In the rural population there are two groups

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distinguished as "farm"⁴ and "non-farm"⁵ groups. This distinction was first made by the Census of Canada in 1931. It is therefore possible to describe the changes in these two groups since that year.

Table III shows the interesting phenomenon of a declining rural farm population in conjunction with a relative increase in the rural non-farm group. During the entire period under consideration, the farm population of the Prairie Provinces decreased from 1.2 million to .9 million or about 25 percent. At the same time the non-farm group increased from .4 million to .5 million or approximately 12 percent. These apparently contrasting trends are the result of a combination of several factors. First of all, the consolidation of farms into larger units forced the small farmer to sell his farm and move out to the neighboring village or small town. He was counted now (for the Census purposes) in the rural non-farm group. Secondly, better social facilities (schools, churches, rural clubs) in the towns, combined with a lack of electricity on widely dispersed farms worked in the same direction, attracting people who still had some ties with farming, to villages

⁴ Persons living on farms in rural areas.

⁵ Persons not living on farms but still residing in rural areas (villages).

TABLE III
Changes in Rural Farm and Non-farm Population (1931-1956)

Province	Group	1931	1941	Percent Change	1951	Percent Change	1956	Percent Change
		('000)	('000)		('000)		('000)	
Prairie Provinces	Farm	1,187	1,142	- 3.8	952	- 16.7	890	- 6.7
	Non-farm	410	491	19.8	466	- 5.1	495	- 6.2
Manitoba	Farm	252	246	- 2.6	214	- 12.8	202	- 5.7
	Non-farm	107	136	26.8	123	- 10.1	137	12.1
Saskatchewan	Farm	563	514	- 8.7	398	- 22.6	361	- 9.4
	Non-farm	171	191	11.3	182	- 4.4	198	9.4
Alberta	Farm	372	382	2.6	340	- 11.0	327	- 3.6
	Non-farm	132	164	24.3	161	- 1.5	160	7.0

Source: D.B.S., 1941 Census, Vol. III, p. 35, 1951 Census, Vol. I, p. 15-19, 1956 Census, Vol. I, p. 10-11.

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and small towns. This movement is further analysed in section D of this chapter.

Compared with the other regions of Canada, the Prairies showed the greatest decline in farm population and among the Prairie Provinces themselves it was in Saskatchewan that the decline was the largest.

The observed decrease in the farm population in the Prairie Region, as well as in the whole of Canada, has been primarily the effect of technological advances in farming which were accelerated during the period under discussion. Mechanization of farm operations has caused a decline in demand for agricultural labour and stimulated the movement of agricultural workers from farms to urban areas. This movement was strengthened by wage differentials and by greater opportunities of employment in cities. Increasing substitution of machinery for labour and modern facilities of transportation have also led to the emergence of a group of farmers who direct farm operations from a neighboring town and are regarded (in official statistics) as urban residents.

3. Age and Sex Distribution

Two of the most important characteristics of the distribution of population are age and sex. Investigation as to the size of the "dependent" population, studies of

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the labour force, school population and examination of in-and-out migration movements would not be adequate without a proper appraisal of the age and sex distribution of population. Some of these aspects (School Population) will be discussed in this chapter, other (Labour Force) in chapter II. Similarly, during the further course of this study reference will often be made to the trends in the age and sex structure of the rural population. Therefore, it is believed, such an analysis of the changes in composition of the rural population in the Prairie Region is necessary in order to explain some more important implications those changes caused in the Region's economy.

The relevant data have been arranged in the form of a table (Table IV) showing three important age groups which have been selected for this analysis: (a) children up to 14 years of age, (b) young persons of 15 to 24 years of age, and (c) an elderly group of 65 years and over.

The first group is of primary importance inasmuch as elementary and secondary education is concerned. The second, so called "critical" age group is also very important, because it determines the volume of new entrants into the labour force and, at the same time, reflects "off-farm" movement of young boys and girls. Changes in the last age group are interesting, inasmuch as they indicate whether or not the Prairies rural population is aging.

TABLE IV
Percentage Distribution of Selected Groups of Rural Population - Males and Females
(1931 - 1956)

Province	Year	TOTAL			MALES			FEMALES		
		0-14	15-24	65-	0-14	15-24	65-	0-14	15-24	65-
Manitoba	1931	35.5	19.8	4.5	33.0	20.2	4.9	38.3	19.4	4.2
	1941	31.1	19.6	5.7	29.4	19.5	6.2	33.1	19.7	5.2
	1951	33.7	15.4	7.5	32.5	15.7	8.1	35.4	15.0	6.8
	1956	35.5	14.4	8.0	34.2	14.9	8.6	37.1	4.9	7.4
Saskatchewan	1931	37.5	20.0	3.2	34.4	20.0	3.4	41.5	20.1	2.8
	1941	32.5	20.3	4.7	30.2	19.9	5.2	35.2	20.7	4.1
	1951	32.6	15.4	7.7	30.9	15.5	8.7	34.5	15.3	6.6
	1956	34.4	13.9	8.5	32.8	14.1	9.5	36.2	13.6	7.3
Alberta	1931	32.7	19.0	3.5	30.2	18.1	3.7	35.6	20.2	3.3
	1941	31.9	19.0	4.7	29.1	18.4	5.3	35.4	19.7	4.0
	1951	33.7	15.9	6.3	31.4	16.3	7.2	36.4	15.5	5.1
	1956	35.8	14.5	6.9	33.7	14.9	7.7	38.3	14.1	5.5

Source: D.B.S., Census 1941, Vol. 1, p. 620, 1951, Vol. 1, p. 21,
26-28, 1956, Vol. 1, p. 17-3-6-7.

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Looking first at the changes of the "15 to 24" age group we notice that the largest decrease in this group has occurred in Saskatchewan, where in terms of percentage of total rural population, it dropped from 20.0 in 1931 to 13.9 in 1956. Females in that group showed an even larger decline, from 20.1 percent to 13.6 percent of the total. Similar declines occurred also in Manitoba and Alberta.

Bearing in mind the fact that the birth rate of the rural population remained relatively stable over that period, one must conclude that the young people have a strong preference for non-farm work. This trend has been accentuated especially during the second and third decades.

A contrasting trend is noted in the proportion of older persons, i.e. those 65 years and over. The largest increase occurred again in Saskatchewan where the proportion of the older population increased from 3.2 in 1931 to 8.5 percent in 1956. The same trend is displayed in Manitoba and Alberta.

This relative increase in the retirement age group described above is, in a sense, an indication of the aging process of a society and also has important repercussions in its economic and social structures.

The increasing proportion of this "dependent" population group, which in Manitoba and Saskatchewan approaches 10 percent of total rural population, undoubtedly must

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have had some economic consequences in these provinces.⁶

Changes in the two groups already mentioned acquire more significance when compared with a group of children under working age, i.e. under 15 years. Only in Alberta does this group show an increase between 1931 and 1956 census years. In Saskatchewan, there has been a relative decline, (in proportion to the total rural population), while in Manitoba it remained on the same level. One remarkable thing, however, should be noted about these trends. In all three Prairie Provinces, the "group under 15" declined from 1931 to 1941 and then registered a considerable increase. This small "explosion" of young children came as a result of a very high post-war birth rate, and has by no means been confined to the Prairies, although of the other provinces, only Ontario and British Columbia record a larger percentage increase in this age group.

Apart from the changes in age distribution of the Prairies rural population, some significant changes occurred also in the sex distribution during the 1931-1956 period. Generally, the sex ratio at birth averages 105 (that is, 105 males to 100 females). Subsequently, however, the

⁶ Such as: changes in consumers' patterns, increased amounts paid in Old Age pensions, etc.

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death rates for males and females tend to make this ratio equal unity.⁷

In the Prairie Provinces the situation is different on account of two factors, namely, male-dominated immigration and an off-farm movement (with young females being more numerous than young males) which influenced the sex distribution of the population. For the convenience of comparison a short table showing the changes in the sex ratio for each province over the whole length of the 1931-1956 period is given in Table V.

There are two interesting points illustrated in this table: (a) a generally high level of the proportion of males to females, and (b) a slow decrease of this proportion over the 1931-1956 years. This high ratio of rural males to females in the Region averaged in 1956 at 116.7.

A slow decline in the sex ratio from the high level of the "thirties", which was caused by the last wave of predominantly male settlers, has been more pronounced in Saskatchewan than in Manitoba or Alberta. This appears to further substantiate previous remarks about the relatively greater attraction of urban and industrial centers in the latter two provinces than in Saskatchewan. A heavy "off-farm" movement of the 15-24 years age group has occurred in that province.

⁷ W. S. Thompson, Population Problems, Toronto, McGraw-Hill, 1953, p. 91.

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TABLE V

Sex Ratio of the Rural Population
of Prairie Provinces

(1931-1956)

Provinces	1931	1936	1941	1946	1951	1956
Manitoba	119.4	116.8	116.4	114.9	116.0	115.1
Saskatchewan	124.9	122.1	120.9	122.9	116.8	115.8
Alberta	120.8	128.1	124.7	123.3	121.2	119.3

Source: D.B.S., Census 1946, Vol. 1, p. 65,
1951, Vol. 1, p. 13-2, 1956, Vol. 1,
p. 10-11.

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Although no detailed information as to the age and sex composition is available, it is conceivable that males dominated in this movement.

This analysis shows that the large scale redistribution of population in the Prairie Region has occurred in two directions; from the rural to urban group, and to a lesser degree, within the rural population, from the farm to non-farm group. At the same time, the sex ratio has been slowly declining from the high levels of the early "thirties". An awareness of these historical demographic changes should prove helpful when carrying out an analysis of farm organization and farm income, which will be done in the following chapters.

B. DEMOGRAPHIC CHARACTERISTICS OF FARM FAMILIES

1. Decline in the Size of Rural Family

The family and its importance in society has frequently been the subject of investigation and discussion in social and economic studies. Toward the end of the XIX century there was a popular belief that the decline in family size was due to economic reasons (viz. higher standard of living). However, the most widely accepted reason for the decline in family size seems to be the changing pattern of family organization. The family is no longer a self-

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contained and social unit. Its functions, for instance, in bringing up children have been replaced to a considerable extent by school and voluntary associations and groups.⁸

Furthermore, it loses another distinctive feature when the head of the family ceases to be the only wage earner. With both husband and wife working, a family, especially if it is a young family, is not likely to be a large one.

It appears that rural families have shown more resistance to the declining trend in size than urban families. The comparison between these two types of family for the Prairie Region, which is illustrated in Table VI confirms this view. Family data shown there are restricted to those members of the family who are living together on a farm as a part of a housekeeping unit.

Between 1931 and 1951 the size of the rural family in the Prairies declined. The rate of decline was about 19 percent, although when compared to the urban family, the absolute size of the rural family in 1951 was approximately 18 percent larger than the urban one. On a provincial basis the largest decline in the size of the rural family in that period occurred in Saskatchewan - the smallest in Alberta. Saskatchewan was also the only province where the number of

⁸ K. Davis, "Reproductive Institution and the Pressure for Population", in Sociological Review, (U.K.), Vol. XXIV, No. 3, July 1937, p. 289.

TABLE VI
Prairie Family, Rural-Urban Comparison (1931-1956)

Province	Population	1931		1941		1951		1956	
		(000)	size	(000)	size	(000)	size	(000)	size
Prairies	rural	248	4.8	310	4.3	318	3.9	307	4.1
	urban	167	4.0	222	3.5	293	3.3	365	3.5
Manitoba	rural	66	4.8	87	4.2	76	4.0	75	4.1
	urban	60	4.0	80	3.4	115	3.3	130	3.4
Saskatchewan	rural	105	5.0	122	4.4	133	3.9	126	4.0
	urban	54	4.1	68	3.7	64	3.4	79	3.5
Alberta	rural	78	4.6	101	4.2	109	4.0	106	4.1
	urban	54	4.0	74	3.5	114	3.3	157	3.5

Source: D.B.S., Census 1941, Vol. 1, p. 434, 1951, Vol. X, p. 80-81,
1956, Vol. 1, p. 44-14-17-18.

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rural families was larger than urban. In the other two provinces this relationship was reversed.

From 1951 to 1956 the declining trend in family size was arrested and actually a slight increase occurred in all three provinces for both rural and urban types. A similar increase has also been registered in the number of rural and urban families in the Prairie Region. In 1951 and 1956 Census years information was available for the first time on the rural farm and non-farm families. According to these sources both farm and non-farm families within the rural group registered a slight increase in the average number of persons per family. In addition, the rural farm family has proven to be the largest of all types with 4.1 and 4.2 persons in the family unit in 1951 and 1956 respectively.

2. Factors Behind the Decline of the Rural Family

It appears then that the rural family in the Prairie Region has not escaped the family limitation process, which has been going on throughout the whole country from 1931 till 1951, in spite of the post-war increase in the birth rate. However, the latter might have been a factor in the 1951-1956 increase in the family size. Various reasons have been suggested as an explanation of this process. It has been pointed out that with increasing income, rational planning for one's future and that of one's children becomes

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possible. An improvement in social status may be sought and a tendency toward thrift may develop. This seems to be a plausible explanation.

In 1951 the Prairie farmer reached the peak of his income which could have contributed to the general rational mentality fostering the desire for a smaller family. Improvements in farm income and a decline in rural family size occurred simultaneously from 1931 to 1951. Then, from 1951 to 1956 both trends were reversed. Therefore, one may suggest that there seems to be a certain negative correlation between farm income and the size of the rural family. However, this relationship does not seem to work so well in the case of the urban family. There, an increase in the size of the family was accompanied by an increase in income as well.

Another reason for the declining size of the rural family may be the increasing economic cost of rearing children. Prices of commodities and services purchased by Prairie farmers increased relatively more than the prices of the agricultural products they sold. Also, school attendance and the average period of education have increased and as a result children have to be fully supported by their parents for a longer period of time than was previously the case.

At the same time the large farm family no longer

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enjoys the economic advantage it used to have in the past. In times when relatively few agricultural implements were available, and those which could be obtained were costly, numerous children could profitably be employed in various farm tasks. With increasing farm mechanization on the one hand, and rising farm incomes on the other, this economic advantage has been lost.

Apart from illustrating the declining trend in family size, Table VI shows also the tendency of the rural family to be larger, on the average, than the urban one. One of the reasons is the higher rural birth rate. Fertility figures in 1951 and 1956 show a higher ratio of children under five born to total married women of 15 to 44 years of age in rural than in urban areas.

The long-run declining trend in rural family size in the Prairie Region is expected to continue for some time, in spite of a brief reversal in the 1951 to 1956 period. Forces which should work in this direction include a rising standard of living, improving education in rural areas, and the increasing tendency of farmers to substitute machinery for farm labour.

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C. SOME CHARACTERISTICS OF FARM OPERATORS⁹1. Changes in Age Distribution

A considerable proportion of rural population consists of farm operators. In 1951 one person out of every six in the Prairie Region belonged to that group. The term, as explained below, applies to the person directly responsible for agricultural operations and management of the farm. Normally, it is the father of the farm household who is the operator of the farm. He is an "active" farmer and in most cases resides on his farm. However, there seems to be a small, but steadily growing proportion of farm operators managing their farms from a nearby village or town. This trend to non-resident farmers which is presented in Table VII is a peculiar feature of the Prairie Region.

In all three provinces the proportion of non-resident farm operators has increased considerably over the 1946-1956 decade. For Manitoba and Saskatchewan this proportion has almost doubled. In the latter province one farmer out of five has been living outside his farm in 1956. In some areas of the province where farmers arranged to have planting and harvesting done on a custom basis (i.e. hiring or renting several huge and expensive combines) this

⁹ Persons who manage or operate farms, owned or leased.

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TABLE VII

Non-Resident Farm Operators - Percentages
(1946-1956)

Year	Manitoba	Saskatchewan	Alberta	Prairie Provinces
1946	6.1	12.7	8.2	9.9
1951	8.6	16.2	9.9	12.5
1956	10.4	20.5	11.8	15.4

Source: D.B.S., Census 1951, Vol. X, p. 471,
1956, Vol. III, p. 7-28.

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proportion reached as high as 30 percent of the total farmers. This type of farming is possible only under a "one crop" economy which is typical of the Prairies, especially of Saskatchewan.

In view of a long declining trend in both the number of farms and farmers it would be interesting to see whether different age groups of farm operators were affected by this decline in the same way.

Table VIII shows an increase over the 20 years in the proportion of farms occupied by farm-operators in Manitoba in the younger age groups, that is, under 30 and 30-39 years old. At the same time, while in 1931 and 1941, the "40-49 years" group was the largest (percentage wise). In 1951, a younger group of 30-39 years took the lead.

In Saskatchewan a similar trend occurred, that is farm operators under 40 years of age increased in proportion to total. A middle age group of 40-49 years registered a considerable drop from 30.5 percent in 1931 to 22.9 percent in 1951. However, the last two age groups (60-69 and 70 years and under) have increased during the period under review in Saskatchewan in contrast to Manitoba, where the same groups have slightly decreased.

In Alberta, the first three age groups, (that is farm operators below 50 years of age), experienced a drop which was considerable for the youngest group. The

TABLE VIII
Percentage Distribution of Farm Operators by Age Groups (1931-1951)

Province	Year	Operators Number	Under 30	30-39	40-49	50-59	60-69	70
Manitoba	1931	50,203	10.4	23.2	27.8	21.1	13.0	4.5
	1941	54,073	11.2	22.2	24.0	23.9	14.2	4.5
	1951	52,134	12.4	26.1	25.0	20.2	13.1	3.2
Saskatchewan	1931	119,835	13.6	24.2	30.5	20.5	8.5	2.7
	1941	121,054	13.4	21.6	22.1	25.3	14.1	3.5
	1951	111,586	15.4	25.5	22.9	18.3	14.3	3.6
Alberta	1931	88,058	15.0	24.1	28.6	19.5	9.6	3.2
	1941	90,750	11.3	22.8	23.8	24.6	13.7	3.8
	1951	84,044	13.1	23.4	25.1	20.8	13.9	3.3

Source: D.B.S., Census 1951, Vol. X, p. 472.

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proportion of the remaining older part of the population of farmers, that is those 50 years of age and above, increased substantially.

All these changes in age distribution of Prairie farm operators are expressed in percentages, that is ratios to totals in each given year. In gathering all the pertaining data, official statistics listed only one operator per farm, and, for instance, in case of father-son partnership only the senior member of the family has been listed as operator. Therefore, in Table VIII there is a certain amount of bias in favour of older age groups.

One conclusion which may be drawn from the changes in age distribution described in Table VIII is that in spite of the increasing number of young males leaving farms to seek better opportunities elsewhere, the average farm operator appears to have become younger. It might be that in the general decreasing trend of number of farms and farmers there were enough older farmers either retiring or abandoning farming altogether to counter balance the off-farm flow of youth. Furthermore, the new entrants into the farming occupation from outside were, on the average, young people.

This tendency of the Prairie farm operator to become "younger" has been accentuated during the 1941-1951 decade. For both Manitoba and Saskatchewan the median age of farm operators has decreased by 3 years from 47 to 44, while in

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Alberta a smaller decrease from 47 to 45 took place.

2. Variations in the Length of Farm Operation

Another characteristic of farm operators significant in this analysis, is the length of occupancy of present farm.

A trend which is revealed by Table IX indicates an increase in the proportion of farm operators managing their present farms for 5-9 years and a decline in "short term" operators, that is, farmers who operated their farms for less than five years. This trend has been common to all three provinces. In Alberta there has been a striking decrease in the "below 5 years" group between 1931 and 1941, from 50 to 24 percent.

Although a group of farmers who had been on their present farms for the relatively short period of time ("below 5 years") was still considerable in 1951, yet even larger proportions have been occupying their present farms for fifteen years or more. In Saskatchewan the latter group is almost twice the size of the former, while in Alberta and in Manitoba the difference between these two groups is only slightly smaller.

The trend of the Prairie farmer operating the same farm for a longer period of time described in Table IX indicates that farming in the Prairies has become a more stabilized occupation. There are several factors behind this

TABLE IX
Percentages of Farm Operators by Years of Occupancy on Present Farm
(1931 - 1951)

Length of occupancy (years)	Manitoba			Saskatchewan			Alberta		
	1931	1941	1951	1931	1941	1951	1931	1941	1951
Below 5	32.6	27.0	26.8	35.1	23.5	24.6	40.4	23.9	26.5
5 - 9	16.2	18.2	22.4	17.2	16.2	22.6	15.8	17.0	21.4
10-14	16.1	15.5	15.2	15.2	16.8	13.3	15.3	21.0	13.7
15-24	35.1	19.1	17.2	32.5	18.9	17.5	28.5	19.3	20.1
25 or more	-	20.2	18.4	-	24.6	22.0	-	18.8	18.3

Source: D.B.S., Census 1951, Vol. X, p. 475.

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stabilization process but two of them appear to be most important. The first one is a decrease in number of marginal farms.¹⁰ Consequently, there are fewer farmers now than before abandoning farms because of their inability to earn a living. The second one is a radical change in attitude of would-be new entrants with respect to farming as an occupation. Twenty-five years or so ago, a prospective farmer did not think it necessary to get some vocational training so long as he was healthy and willing. However, the technological changes which have since then made farming a considerably more complicated operation, contributed greatly toward the change in such an attitude. Even if he thought it too late to improve his own educational standard, the farmer noticed he must provide better education for his children.

D. EDUCATION

1. Importance of Education to the Farmer

It is only fairly recently that the importance of education to the farmer has been realized and properly appraised. The time was when a pair of hands and a strong back were sufficient requirements for a successful farmer.

¹⁰ W. M. Drummond and W. MacKenzie, "Progress and Prospects of Canadian Agriculture", Royal Commission on Canada's Economic Prospects, Ottawa, Queen's Printer, 1957, p. 61-70.

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Today, the volume of manual labour has been drastically reduced, but successful farm management demands from the farmer considerably more knowledge and formal education than before. Thus a relatively well-educated farmer possesses a definite advantage over his cousin with little or no education.

For the purpose of our analysis the attendance at school and the length of schooling should provide a uniform measure of the educational level prevailing in the Prairie Region. The former should reveal changes, of any, among rural population of 5 to 24 years old; the latter would indicate whether there has been any improvement in the amount of education received by that part of population (15 years and older) no longer attending school.

2. School Attendance of Various Age Groups

Before proceeding with the analysis of the changes illustrated in Table X, some qualifying remarks are necessary. In the first place, rural population attending school in the Prairies has been subjected to movements from rural to urban areas. These movements affected mainly the last two age groups and resulted in increasing somewhat proportions of persons attending school in those two groups. Secondly, the official definition of rural areas in 1951 differed slightly from that of 1931. In spite of these differences, however, the school attendance data are broadly comparable.

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TABLE X

Percentages of Rural Population 5-24 Years of Age
Attending School by Age Groups (1931 and 1951)

Age Groups	Manitoba		Saskatchewan		Alberta	
	1931	1951	1931	1951	1931	1951
5 -9	65.9	66.7	63.7	63.7	68.4	62.9
10-14	92.6	95.5	95.0	96.6	95.3	96.7
15-19	27.1	39.9	26.6	48.0	32.3	49.6
20-24	1.6	2.8	1.2	3.4	1.6	3.7

Source: D.B.S., Census 1931, Vol. V, p. 1364,
1951, Vol. II, table 25.

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Examination of the data contained in Table X reveals one important fact: The proportion of the rural population attending school increased between 1931 and 1951 in all age groups with the exception of children from 5 to 9 years of age in Alberta and Saskatchewan. The largest increase has been registered by the last two age groups 15 to 19 and 20 to 24 years of age. Part of this increase is attributable to the population movement from rural to urban areas, as has already been noted. Most of it, however, represents a genuine increase and indicates, together with similar increases in other age groups, a definite improvement in the educational level in the Prairie Region.

3. Length of Schooling Received by Prairie Farmers

Another factor related to the educational levels of the rural population is the number of years spent at school by those persons of 15 years and older now no longer attending. In a sense, the length of schooling is a "stronger" indicator of how well a given population is educated, since it encompasses a larger part of it than does school attendance. It is considered to be a more meaningful measure of the educational standards of the Prairie farmers than attendance at school because the children of non-resident farmers are not included in the school attendance statistics of rural schools.

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In Table XI there are two interesting differences illustrated between educational levels: One refers to provinces, the other to farmers' age groups. As far as the provinces are concerned, in 1951 Alberta had the highest percentage of farmers of all three age groups who completed 9 or more years of schooling. Manitoba, on the other hand, was the province with the highest percentage of relatively little educated farmers, that is, those who completed only 9 or less years of schooling. The other difference in standards of education is noticeable among the three age groups of farmers. The youngest farmers group, i.e. from 15 to 29 years of age, contained the highest proportion of persons who received 9 to 12 years of schooling (equivalent to secondary school) and almost as high a proportion as the "30-44" age group, of persons with 13 and more years of schooling. This by itself represents a certain improvement in rural education in the Prairie provinces. A similar improvement is shown by all three provinces when median years of schooling are compared for the rural population of 15 years and over, not attending school, as indicated in Table XII.

It may be concluded then, that the Prairie farmer nowadays is a much better educated person, on the average, than his predecessor thirty years ago. Relatively more farmers have had their secondary education completed and

TABLE XI

Percentages of Rural Population 15 Years Old and Over Not Attending School
by Years of Schooling (1951)

	15-29 years old Years of schooling				30-44 years old Years of schooling				45 years old & above Years of schooling			
	<u>Total</u>	<u>Under 9</u>	<u>9-12</u>	<u>13-</u>	<u>Total</u>	<u>Under 9</u>	<u>9-12</u>	<u>13-</u>	<u>Total</u>	<u>Under 9</u>	<u>9-12</u>	<u>13-</u>
Manitoba	30.1	17.8	11.3	1.0	30.8	20.2	9.3	1.3	39.1	30.2	7.9	1.0
Saskatchewan	28.6	15.1	12.1	1.4	31.3	19.6	10.2	1.5	40.1	30.8	8.1	1.2
Alberta	29.8	14.2	14.0	1.6	31.6	18.1	11.8	1.7	38.6	28.1	9.1	1.4

Source: D.B.S., Census 1951, Vol. X, p. 241.

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TABLE XII

Median Years of Schooling of Rural Population
15 Years Old and Over (1941 and 1951)

Year	Manitoba	Saskatchewan	Alberta
1941	7.0	7.2	7.4
1951	7.1	7.3	7.6

Source: D.B.S., Census 1941, Vol. I, p. 746,
1951, Vol. X, p. 241.

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also, judging from the increase in the group which received 13 and more years of schooling, a higher percentage of them received college or equivalent training.

E. CONCLUDING REMARKS

Demographic structure and trends within it are important factors influencing the economic development of nations. Variation in the age and sex structure of the population is a major factor in controlling the ratio of the labour force to total population. It also influences its occupational distribution. The decline in population, for example, in the short-run will tend to raise per capita output through raising the ratio of the labour force to total population. In the long-run, however, with continuous decline, the age structure becomes "top-heavy", that is, it has too high a proportion of aged persons which tends to reduce per capita output.¹¹ Changes in the rural population exert similar influences upon such aggregates as farm output and farm income.

Within the Prairie Region there has occurred a considerable redistribution of population since 1931. The total population has increased from 2.4 million in 1931 to

¹¹ "The Determinants and Consequences of Population Trends", United Nations Population Studies, No. 17, New York, United Nations, 1953, p. 222.

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3.1 million in 1960, which represents an annual rate of average growth of slightly more than one percent. Rural population, on the other hand, has decreased from 1.6 million in 1931 to 1.4 million in 1956, which comes to a .5 percent decrease per year. Finally, farm population declined from 1.2 million in 1931 to .9 million in 1956. In other words, farm areas have been losing people at an average annual rate of one percent.

These large scale movements of population across the region have not affected all age groups at a uniform rate. The critical age group, i.e. 15 to 24 years old has declined, while the retirement group (65 years and older) registered a considerable increase.

The increasing concentration of the Region's population in urban centers and the corresponding drain upon rural population has had a double-sided effect upon its economy. On the one hand, relatively unskilled labourers from farms flocking into the cities increase the risk of unemployment, since they are usually the first to be laid-off in case of an economic down-turn. At the same time, this easily available and cheap pool of labour facilitates the establishment and development of those industries which do not particularly need highly skilled labour (logging, forestry, construction, retail trade). On the other hand, the off-farm movement of agricultural workers could have been one of the factors in

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the wage increase of the remaining workers.

Another aspect of the redistribution in rural population described in this chapter was an increase in the group of children "below 15 years of age" which occurred from 1941 to 1956. It created an economic problem of providing educational facilities. A post-war shortage of teaching staff has been acute, especially in rural areas, which could not compete with the salaries or non-pecuniary advantages offered in urban areas.

A similar increase occurred also in the aged persons (65 years and over) group. It increased the burden of dependency, as more funds had to be provided for pensions, welfare schemes and hospital care. It could also have some political implications: Saskatchewan, for example, while being the first province in Canada to introduce a provincial health scheme, was also the province with the proportionately largest increase in the retirement age group.

In the preceding section of this chapter, rural education in all three Prairie Provinces has been discussed rather extensively because of its important role in society, which is undergoing a technological and structural change in its economic development. It has widely been recognized that education, and especially technical education, if it should not precede, must at least accompany economic development. This is true not only for the industrial sector of

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the national economy, where the advantages of a relatively well-educated and trained labour force are obvious, but for agriculture. Some improvement in educational levels has already been noted for the Prairie Region. Rural attendance at school increased for all age groups. A similar increase has been observed in the extent of schooling which the rural population, no longer attending schools, underwent. In the field of rural extracurricular training there has been an intensification of the technical assistance programmes to farmers on both federal and provincial levels. Under the former, Experimental Farm services have been expanded; under the latter, assistance rendered to farmers has been considerably enlarged and covers now almost every field of agricultural activity from crop improvement to drainage and irrigation.

In spite of all this, there seems to be room left for further improvement, especially in the field of basic rural education. More and better schools and teaching staff are still needed in the rural areas.

CHAPTER II

MAIN TRENDS IN THE ORGANIZATION
AND DEVELOPMENT OF FARMS

INTRODUCTION

The last three decades have witnesses considerable changes in the farm economy in Canada generally (although these changes appeared initially and on a greater scale in the Prairie Region). They could be classified into two broad groups: Structural changes and technological changes. Into the first group fall: changes in size of farm, management, usage of land and type of tenure. The second group is comprised of changes in farm mechanization, electrification, pest and weed control, scientific breeding, conservation and irrigation practices and application of fertilizers. Developments in these farm activities depended on and, in turn, influenced each other. They resulted in, or led to, the farm consolidation movement. This movement is peculiar to the Prairie Region because of the unique characteristics of Prairie agriculture (virgin land settled by pioneers, extensive cultivation, flat or gently rolling terrain suitable to the application of agricultural machinery). Within the lifespan of one generation, the average size of Prairie farms almost doubled, while the number of farms decreased considerably.

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This chapter is primarily concerned with an analysis of the changes which led to the consolidation movement. It also deals with certain of the problems of agricultural workers which arose during this period of technological and structural change.

The trend towards larger farms was facilitated, as already mentioned, by the conditions which prevailed in the Prairie Region. Since the land had only recently been settled, the farmer was not bound by institutional inheritance systems of land tenure which often freeze development in "older" countries.

Another factor which worked towards increasing the average size of farms was the highly competitive type of farming in the Prairies. Many relatively inefficient (marginal) farmers had to sell their land and get out of farming altogether.

In addition, those members of the farm family belonging to the younger generation who were often better educated than their fathers, frequently found farming less attractive and migrated to urban centers. This is supported indirectly by the fact that the number of new entrants into farming has consistently been smaller than the number which left farms.

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A. FARM ORGANIZATION

1. General Farm Characteristics

Large scale agricultural settlement of the Prairie came to an end about 1931. Changes in the number and size of farms, total farmland and cultivated land have occurred since then, but they have been on a much smaller scale than previously.

Before proceeding with an analysis of the changes in the size of Prairie farms a few qualifying remarks should be made. First, the intensity of land use varies considerably across the region. For instance, a 300-acre farm in Manitoba may be "larger" in terms of agricultural output than a 500-acre farm in Saskatchewan. Nevertheless, the change in the average acres per farm is a good measure of the consolidation movement which has taken place in the Prairie Region. Secondly, the existence of a semi-arid region in southwestern Saskatchewan and southeastern Alberta, where farms are outstandingly large, has influenced somewhat the average size of farms in the Prairie Provinces as a whole. For example, during the last Census of Agriculture (1956) the average farm size in one district in Saskatchewan was 1,384 acres; in another district in Alberta it was 1,955 acres. A large part of this particular area is used for grazing, and cattle ranches reporting several hundred head

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of cattle are not unusual.

A reorganization of farm operations brought about a 20 percent decline in the number of farms and a 43 percent increase in the average size of farm as shown in Table XIII. This table illustrates changes that have taken place in the numbers, area and average size of farms. The greatest changes in both number and size of farms occurred in Saskatchewan, and the smallest, in Manitoba.

The trend toward larger farms in the Prairie Region is more evident when the changes in the distribution of farms by size groups are examined as indicated in Table XIV.

The most significant percentage decrease in the number of farms occurred within the 101-299 acre range, while the farms above 300 acres registered a considerable increase. Interprovincial variations in the distribution of farms by size groups are not great. There are relatively large farms in Saskatchewan as compared with Manitoba.

2. Changes in Condition of Farm Land

Apart from the changes in the size of farms and changes in the number of farms changes in the cultivated part of farmland are also significant.

A steady, rising trend in acreage of cultivated land is well illustrated in Table XV. The proportion of land under both pasture and summerfallow has increased somewhat,

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TABLE XIII

Changes in Number, Area and Average Size
of the Prairie Farms

(1931 - 1956)

	1931	1941	1951	1956	Percent change 1931-1956
Number of Farms (thousands)	288.1	296.5	248.7	232.0	-19.5
Area in Farms (acres)	109.8	120.1	123.9	126.7	15.4
Average size of Farm (acres)	381	405	498	546	43.3

Source: D.B.S., Census 1946, p. 116, Table 84,
1956, p. 1.1.

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TABLE XIV

Percentages of Farms, by Size Groups
(1931 and 1956)

<u>Year</u>	<u>A C R E S</u>			
	<u>1-100</u>	<u>101-299</u>	<u>300-639</u>	<u>640 acres and more</u>
1931	5.5	38.1	40.6	15.8
1956	5.3	22.5	44.5	27.7

Source: D.B.S., Census 1946, p. 115, 1956, p.2.1.

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TABLE XV

Changes in Pattern of Land Cultivation
in Prairie Provinces

(1931 - 1956)

Type of land	1931	1941	1951	1956
Cultivated land (acres)	59,819	63,531	71,840	75,706
Under crops (%)	66.9	58.6	63.3	62.1
Pasture (%)	2.8	2.8	4.4	4.0
Summerfallow (%)	27.7	35.3	30.0	31.9
Other (%)	1.8	3.3	2.3	2.0

Source: D.B.S., Census 1946, p. 116, 1956, p. 1.1.

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while that under crops has declined by about 5 percent over the 25 years under discussion.

There have been some interprovincial variations as far as proportions of different types of cultivated land are concerned. For instance, in the 1956 Census Saskatchewan reported a higher proportion of land under summerfallow, while Manitoba had proportionally more acres under crops than the other two provinces. This is indicative of the type of farming which prevails in these provinces. In the semi-arid regions of Saskatchewan, where the soil is light, summer-fallow is practiced to conserve moisture.

A characteristic for which the Prairies have been known for quite some time is the so-called "one-crop economy". It is illustrated in Table XVI.

It is interesting to note that the proportion of acreage under wheat has declined by 15 percent since 1931, while that of barley, and "other crops" considerably increased over the 1931-1960 period. This is one of a number of changes indicating a diversification in the Region's agriculture. A good example of the trend away from a one-crop economy is the substantial increase in "other-crop" acreage that has been registered during the last decade (1951-1960). This increase is the result of a growing interest in flaxseed as a cash crop.

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TABLE XVI
Area Under Field Crops in Prairie Provinces
(1931-1956)

Crops	(Percentages)				
	1931	1941	1951	1956	1960 ¹
All crops (acres)	40,006	38,301	43,325	47,017	45,900
wheat	64	55	56	47	49
oats	21	22	19	19	17
barley	8	12	18	17	16
other crops	7	11	7	17	18

Source: D.B.S., Census 1946, p. 10, 1956, p. 2.1.

¹ Preliminary estimates.

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3. Farm Tenure and Economic Types of Farms

Information on farm tenure in the Prairie Region is important inasmuch as the institution of farmer-owner so deeply embedded in a contemporary agricultural society appears to lose ground as a dominant feature of the Prairie's agriculture. As indicated on Table XVII, the proportion of farms operated by owners decreased from 69 per cent in 1931 to 59 percent in 1956. This compares with 90 percent of farmer-owners in the rest of Canada in 1956.

Concurrent with a decrease in the "owner" type of farm tenure there has been also an increase in the proportion of farmers belonging to the "part-owner, part-tenant" category. The proportion has almost doubled over the 25-year period under discussion. This increase can be explained by the fact that some farmers who acquired an expensive agricultural implement discovered they could use it more economically on a larger tract of land. Consequently, they leased additional land usually from a neighboring farm. This is another illustration of the way the consolidation movement has progressed in the Prairies.

Another important characteristic of a farm is the value of production of farm output. In the 1956 Census all farms were classified according to the size of productive capacity into (a) commercial crop and livestock farms, and

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TABLE XVII

Percentage Distribution of Farms by Type of Tenure
(1931-1956)

Types of Tenure	1931	1941	1951	1956
Total farms (number)	288,079	296,469	248,716	232,016
owner	69.0	58.6	60.8	58.8
part-owner ²				
part-tenant	15.8	20.0	26.0	29.1
tenant	14.8	21.0	12.6	11.3
manager	.4	.5	.6	.8

Source: D.B.S., Census 1946, Vol. IV, p. 9, 1956,
Vol. III, p. 7-15.

² Person, who besides having his own farm, rents additional land.

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(b) other farms.³ A special group entitled "institutional farms" was reserved for such types as Government experimental farms, Indian Reserve farms, and the like.

The largest segment of the Prairie Region's agricultural economy is represented by commercial crop and livestock farms. This class accounts for about 91 percent of all farmland in the region. These percentages are, in turn, much higher than those for the rest of Canada. Since commercial farms are those with a potential production value of \$1,200 or more, the fact that such a high percentage of Prairie farmers belong to that category indicates that the subsistence farming is practically non-existent in that region.

There are some differences in size of commercial farms between the provinces. Manitoba in this respect is far behind Saskatchewan and Alberta, where the consolidation movement appears to have made the greatest progress. The large size of institutional farms is due primarily to the fact that the Indian Reserve Farms, Federal Experimental Farms and Community Pastures were classified in this group.

An interesting relationship seems to exist between the type of tenure and the economic class of farm. Practically all partly owned, partly rented farms in the Prairies

³ Classification prepared by the Economic Division of the Federal Department of Agriculture.

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are commercial farms, while relatively high proportions of both "owner" type and "manager" type are placed in the "other farms" class. Again, considerable differences between provinces are apparent in this distribution.

4. Significance of Changes in Farm Structure Reviewed

Between 1931 and 1956 the area of farmland in the Prairie Region increased by 17 million acres. At the same time cultivated land increased by 16 million acres. Concurrent with this trend there was a reduction in number of farms and an enlargement of the average size of farm. This process of farm consolidation brought about a more efficient use of labour and capital. The rate of consolidation was not even throughout the region, however. It varied from one farming area to another, depending on the variations in the physical characteristics of soil and climate.

In Manitoba there has been an important change in the pattern of crop production; decline in wheat acreage and an increase in farmland devoted to flax, vegetables, sugar beets, and sunflowers.⁴ This, combined with an increase in livestock indicates a shift toward a more intensive type of agriculture, in an attempt to adapt to the changing pattern of demand for agricultural products.

⁴ "Prospects for Development in Manitoba", Royal Commission on Canada's Economic Prospects, a submission by the Government of the Province of Manitoba, Winnipeg, Queen's Printer, 1955, p. 14-37.

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In Saskatchewan, and Alberta, where the process of consolidation gained most ground, there has been no perceptible sign of a change in type of farming. These two provinces enjoy higher productivity per farm than any other province in Canada. A larger farm unit has been a major factor in helping farmers in these two provinces to meet the effects of uncertain yields and economic recession.

The chance of a complete crop failure due to pests or hail is minimized, the greater the area under crops, and larger farms are more likely to have bigger stocks of grain carried over from year to year than smaller holdings, thus lessening the danger of feed shortages. In periods of financial difficulty, the larger farm generally commands more credit, since its mortgage value is higher than that of the small farm.

B. TECHNOLOGICAL DEVELOPMENTS IN FARMING

1. Mechanization on Farms

At the beginning of the fourth decade of this century Prairie farmers were just recovering from a period of depression. Agricultural machinery (such as tractors, binders, threshers, and so on) was available, but the rate of mechanization increased very slowly. Horses still provided the main source of power and had to be fed from the land. The remarkable increase in farm mechanization

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occurred only after 1946 when farmers could take full advantage of both relatively high income and an increased supply of machines. A good illustration of this mechanization is given by the drop in the number of horses in the Prairie Region from 2 million or 7 per farm in 1931 to 400 thousand or 2 per farm in 1956.

In reading Table XVIII one must keep in mind the extent of the scarcity of agricultural machinery on farms in 1931. Such a situation in the earlier years means it is relatively easy for the percentage change to run into several hundreds and more. This is what has happened to trucks and grain combines. Their number per 1,000 cultivated acres increased five times and ten times respectively, over the period of 25 years (1931-1956). During the same period of time the number of tractors almost doubled while that of gasoline engines increased by 80 percent only. The only decrease is noted for cars, but in this case a decrease in the number of farmers probably had a stronger effect than the consolidation movement.

Mechanization proceeded at different rates in different provinces. Manitoba's agriculture, as has already been pointed out, has demonstrated its ability to shift from one type of farming enterprise to another. It has also readily taken advantage of mechanization by quickly changing from horse to tractor power. The rate of increase in total

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TABLE XVIII

Farm Machinery in Prairies
Average Number per Thousand Acres of Cultivated Land
and Percent Change (1931-1956)

Year	Tractors	Trucks	Grain Combines	Card	Gasoline Engines
1931	1.36	.36	.14	2.23	1.38
1941	1.71	.66	.27	1.95	1.23
1951	3.29	1.84	1.10	1.97	1.65
1956	3.62	2.14	1.54	1.92	2.48
Percent change 1931-1956	+166%	+494%	+1,000%	-14%	+80

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number of tractors in Manitoba was the highest in all three provinces. In 1956 the average number of tractors per reporting farm stood at 1.40, again the highest level in the region. The increase in grain combines in the province was less spectacular on account of the smaller size of farm and diversified crop production. Nevertheless, the increase in the value of farm machinery has been substantial, for example, from 55 million dollars in 1931 to 181 million dollars in 1951.⁵ When allowance is made for the rise in prices, this represents an increase of more than 200 percent in real investment.

The process of farm mechanization has also had revolutionary effects on all aspects of the agricultural industry in Saskatchewan. Farm output expanded but farm costs also increased and have become much more inflexible. Nevertheless large farms are now in a better position to "weather the storm", while the farmer on 300 acres or less is more vulnerable to economic fluctuations than ever before.

Among all types of farm machinery in the province of Saskatchewan, the greatest increase is noted in the number of grain combines (almost ten-fold). The large Saskatchewan farm, specializing in wheat, seems to be best suited to take full advantage of utilizing such a big machine. The

⁵ Ibid., p. 19.

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province had also in 1956 the largest number of gasoline engines per reporting farm.

The farm mechanization process in Alberta resembles very much that of Saskatchewan. Alberta had in 1956, 1.07 grain combines per farm and in this respect was ahead of the two other provinces. The total number of these machines has increased more than ten-fold since 1931. During the same period of time the total number of trucks increased seven times. This is also the only province in the region where the average number of cars per farm has actually increased since 1931.

One qualification seems to be necessary in this analysis of the farm mechanization process, that is the agricultural machines themselves have been considerably improved since 1931. Therefore, when comparing changes in either total number or averages per farm, one should realize that a modern, powerful tractor or a multiple combine can do much more field work than their counterparts dating circa 1931. Unfortunately, there is no objective method to measure these quality changes.

Another feature of the technological development in Prairie agriculture, which is perhaps equal to mechanization, is that of farm electrification. Statistics on the amount of electric current consumed on farms, which would be the best measure for this analysis, are not readily avail-

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able. The only information found in official records is that which pertains to the number of farms reporting use of electric power.

A great improvement in the electrification of the Prairie Region took place between 1931 and 1956. The number of farms reporting electric power installations increased more than 14 times during that period. As indicated in Table XIX, while in 1931 only one farm was using electric power out of 33, (or gas), in 1956 every second farm had electricity. In 1956 the main source of electricity was through the power line from a central power station (almost 90 percent of all farms with electricity), although in Saskatchewan 10 percent of farmers still used electricity generated by wind and other sources of power.

Manitoba leads as far as percentage of farms equipped with electricity is concerned. Alberta and Saskatchewan are far behind in this respect. A plausible explanation of this is offered by the fact that it would be unprofitable to carry out line (from the power houses) over the great distances separating individual farms in these two provinces. Manitoba in this case has enjoyed an advantage of both smaller size and greater density of farms per square mile. This view seems supported by the fact that there was more small than large farms reporting electricity on farm.

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TABLE XIX

Farms Reporting Electric Power
Number and Percent of all Farms (1931-1956)

Year	Prairies		Manitoba percent	Saskatchewan percent	Alberta percent
	Number	Percent			
1931	8,786	3	4	3	3
1951	64,130	26	48	16	24
1956	126,179	54	84	42	52

Source: D.B.S., Census 1956, Bulletin 2-7-8-9,
Table I.

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The process of farm mechanization has been one of the chief factors in the long-run increase of farm output. It has certainly contributed towards increasing yields of main cash crops. Wheat yields, for instance, increased from 12.2 bushels (1931-1935 average), to 19.8 bushels per acre (1956-1960) average, or 62 percent for the whole Prairie Region.⁶ Highest yields have been experienced by Manitoba, where the drought hazard is not as severe as in the other two provinces.

It goes without saying that all this improvement cannot be attributed to farm mechanization alone. There have been other technological factors which played their part as well. However, there seems to be no doubt that the increasing use of modern, powerful machinery by Prairie farmers enabled them to complete sowing and harvesting operations in a shorter time than could otherwise have been possible. This is important in a region where the growing season free of frost is short and the delay of harvesting by a day or two may spell the difference between a good and a bad crop.

2. Other Technological Factors

The volume of agricultural production in the Prairie Region increased about 52 percent between 1931 and 1956.

⁶ "Farm Income", Handbook of Agricultural Statistics, Ottawa, Queen's Printer, 1959, p. 14.

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Acreage of cultivated land increased at the same time by 26 percent and thus, productivity per acre increased by about 27 percent. There were various factors which brought about this increase in agricultural productivity. To measure statistically the influence of each single factor would be very difficult, if not impossible, because of the incomplete historical data. However, some attempt should be made to illustrate the extent and the importance of the improvements of technological process.

There is no doubt that the Prairie Region has witnessed considerable progress inasmuch as cultivation techniques, use of fertilizers and weed spraying is concerned. In 1950 and again in 1951 two studies were conducted by the Saskatchewan Office of the Economics Division, Federal Department of Agriculture,⁷ High yielding and low yielding farms were studied for the correlation between certain cultivation techniques and the size of yields. The result of these surveys was that on high yielding farms on loam and clay soil in distinction to low-yielding farms, a considerably higher percentage of farmers used both blade and disc type implements, applied fertilizer, performed more than two operations on summerfallow, and used weed spray. A

⁷ "Prospects for Economic Growth in Saskatchewan", Royal Commission on Canada's Economic Prospects, a submission by the Government of the Province of Saskatchewan, Regina, Queen's Printer, 1955, p. 21.

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significant feature of these surveys was that varieties of grain sown and seeding time did not vary appreciably between high and low-yielding farms. The surveys also yielded some information on costs. An extra operation on summerfallow might cost up to \$100 per acre, fertilizers cost between \$1.50 to \$2.50 per acre and weed spray about .50c for chemicals and an extra .25c or .30c for application.

Another study of the effects of technological innovation on cost of production and on physical factors employed was carried out by the Federal Department of Agriculture in 64 test locations on privately owned farms in all three Prairie provinces.⁸ The results have shown that due to changes in technology yields per acre for each grouping have increased in recent years and that cost per acre in constant terms has not changed significantly.

Important developments in agricultural technology are noted also in moisture conservation practices and irrigation. Drought has been the most serious hazard in the light soil areas of Alberta and Saskatchewan. Long term rainfall records indicate a total annual amount of precipitation varying from 15" at Swift Current to about 15 1/2" at Melfort and Prince Albert, and 16.8" at The Pas, Manitoba.

⁸ I. F. Furniss, "Effects of Agricultural Technology on Per Acre Costs of Producing Wheat at 64 Test Locations in the Prairie Provinces", in Canadian Journal of Agricultural Economics, Vol. VIII, No. 1, 1960, p. 69-81.

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In order to conserve precious moisture farmers in all three provinces turn to summerfallowing practices, especially on land devoted to wheat growing. About three quarters of the wheat crop acreage is grown annually on summerfallow land and the yield obtained is considerably higher than that grown on stubble land.

In 1957 and again in 1958 a special survey (unpublished) was conducted by the Agriculture Division of the Dominion Bureau of Statistics to ascertain the effect of summerfallowing practices on the yield of principal grains (wheat, oats, barley). It was done only for the province of Saskatchewan, but the results are applicable to the other two provinces as well. The survey has shown that yields on summerfallow are appreciably higher than those on stubble land. The difference may be as high as 100 percent. In the 1921-1925 period less than half of the wheat acreage was summerfallow; this proportion has increased, as mentioned earlier, to over 75 percent in 1960.

Another attempt to offset the drought hazard in the Prairie Region and particularly in Alberta and Saskatchewan has been made in the form of irrigation projects. The irrigation systems in Alberta have made water available to about eight hundred thousand acres,⁹ while the potential irrigable

⁹ "Alberta's Economic Prospects", Royal Commission on Canada's Economic Prospects, Alberta, Department of Economic Affairs, 1955, p. 35-38.

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area is estimated at two million acres. The sugar beet area of Taber-Coaldale and the vegetable (peas) area of Brooks-Rosemary are two examples of what irrigation has done to land which otherwise would have been left in a semi-desert condition.

In Saskatchewan the irrigation projects have been on a much more moderate scale and in the majority of cases have been taken care of under the provisions of the Prairie Farm Assistance Act. The irrigation potential in that province has been estimated at about 200 thousand acres (in both small and large projects), excluding the South Saskatchewan River Project. The latter development is estimated to serve an area of about half a million acres,¹⁰ but it may be some time before it is fully completed.

Not inconsiderable improvements have also been made by Prairie farmers in pest control. Annual losses in crops due to insects, principally grasshoppers, wireworms, cutworms and saw-flies may total tens of millions of dollars. In Saskatchewan alone the losses which occurred due to grasshoppers amounted to 6.3 million bushels annually for the ten year period 1944 to 1953.¹¹ It has been estimated that the use of new chemicals and a good control programme can cut losses to the level of 2 million bushels. The

¹⁰ Ibid., p. 10.

¹¹ Ibid., p. 25.

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fight against sawfly damage to grain crops has been carried out mainly by developing insect-resistant varieties. Similar control measures were undertaken in fighting several plant diseases, the most important of which has been stem rust.

However, by far the heaviest losses occurred due to weeds. The Manitoba Weeds Commission estimated¹² the annual cost of weeds to Prairie farmers at 250 million dollars. In Saskatchewan alone, a conservative estimate places the annual loss at 74 million bushels and this amount represents a considerable improvement over the pre-war situation.

Similar advances were made, during the period under discussion in the field of livestock improvements. Scientific breeding of beef and dairy cattle, hogs and sheep has been encouraged by the agricultural Federal Experimental Farms. The most spectacular results were achieved with poultry; increasing the egg-laying rate, curtailing the fattening period for chickens and turkeys. An increased use of prepared feeds treated with antibiotics resulted in healthier and heavier stock in both hog and poultry production.

Finally, in addition to technological developments, a word or two should be mentioned about the Government-

¹² Ibid., p. 26.

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sponsored crop insurance scheme, which has just recently been introduced in Manitoba. Its purpose has been to spread out burden of crop losses of individual farmers more evenly and at a cost they could afford. It is too early yet to predict the results of this scheme, but it seems to work well, and the other two provinces might soon follow Manitoba's example.

C. FARM LABOUR

1. General Considerations

A considerable decline in the Prairie Region farm population has already been described in the first chapter of this study. The last official benchmark with respect to this movement was the 1956 Census. In spite of a lack of official figures the continuation of this declining trend during the last four years (1957-1960) may be forecast, based on the fact that the agricultural labour force has been declining.

The agricultural labour force according to the official definition consists of all civilian non-institutional workers 14 years old and older who are working or seeking work on farms.

Before discussing the details of changes in the farm labour of the Region, let us see what has happened to the relative position of the agricultural sector in the

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entire Canadian economy, during the last decade (1950-1960).

Out of eleven industries, agriculture occupied second place in 1950, accounting for 25 percent of the total labour force. In 1960 with only 675 thousands of persons 14 years old and over, it has been pushed down to fourth place by such rapidly growing industries as Service and Trade. The drop of 343 thousand agricultural workers represents a 34 percent decrease within the last decade, or an annual rate of decline of 3.4 percent. This represents a very rapid exodus and it is unlikely that farm employment will continue to decrease at such a pace.

In the Prairie Region as a whole the number of persons with farm jobs has declined by 40 percent from 1946 to 1960. This decline was not only the largest in Canada in absolute numbers¹³ but it was continuous throughout the period.

It is revealing to compare the changes which occurred in that period of time (1946-1960) within the agricultural and non-agricultural group.

Table XX reveals that during the 15 years from 1946 to 1960, while the agricultural labour force dropped by 40 percent, the non-agricultural labour force increased by 54

¹³ Trends in the Agricultural Labour Force in Canada, Department of Labour, Ottawa, Queen's Printer, 1960, p. 9.

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TABLE XX

Changes in Agricultural, Non-agricultural
and Total Labour, Both Sexes
(1946-1960)

Type of Labour Force	1946	1960	C h a n g e	
			Thousands	Percent
	('000)	('000)		
Agricultural	467	279	-188	-40.2
Non-agricultural	502	775	273	54.4
TOTAL	969	1,054	85	8.8

Source: Compiled from the D.B.S. Labour Force Survey.

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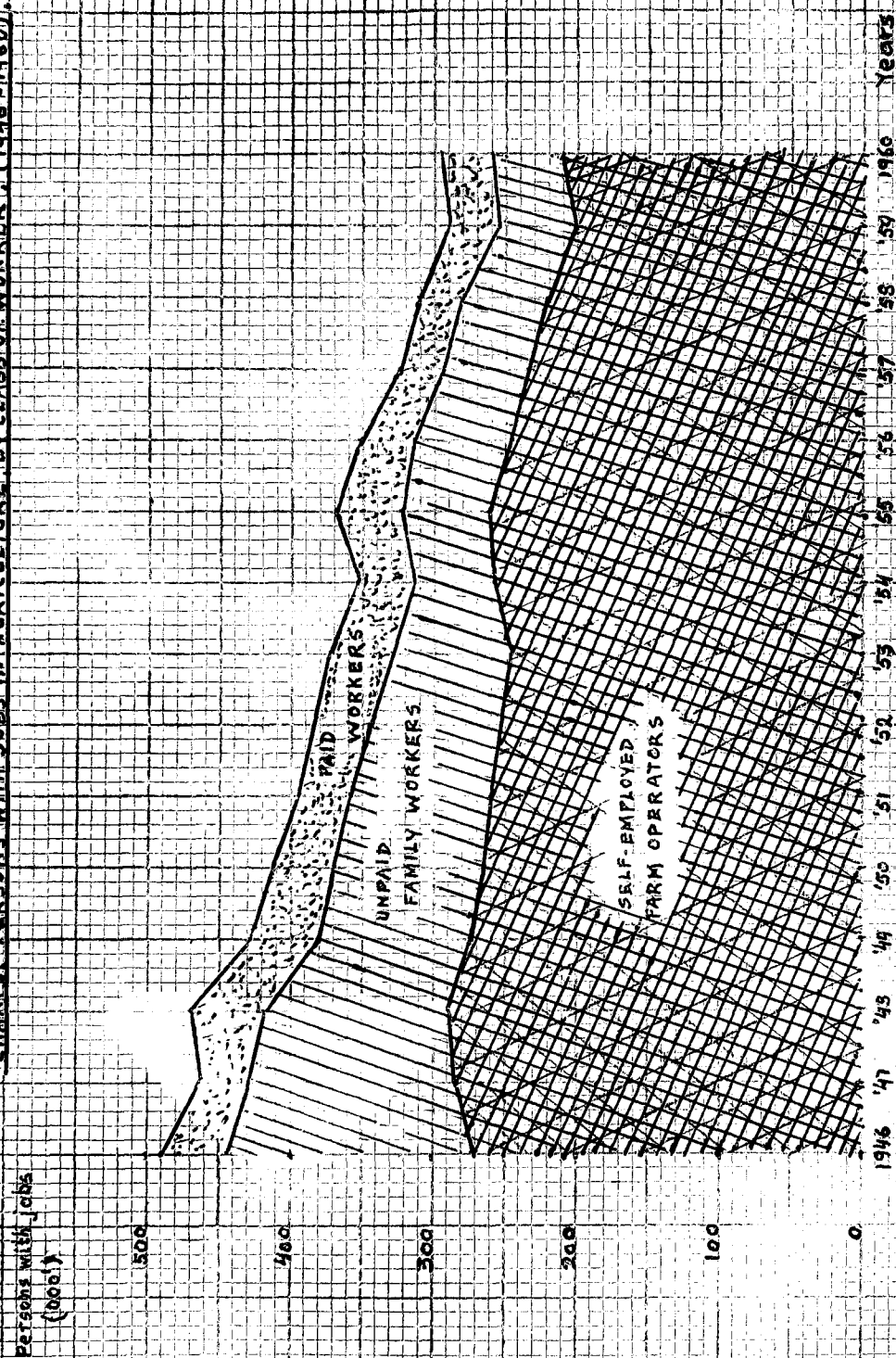
percent. These contrasting trends, combined with the fact that the total labour force increased at the same time by 9 percent, seem to point directly to the movement of the agricultural worker from rural to urban areas in the Prairie Region.

This off-farm movement of agricultural workers would have been more pronounced but for the recent immigration. The number of immigrants entering Canada since 1946 amounts to about 2 million.¹⁴ Agricultural group, i.e. persons who gave their intended occupation as farming, accounted for nearly 17 percent of all adult immigrants. However, only a very small proportion of immigrants remained in agricultural occupations for a period longer than one or two years. Consequently, although the overall immigration into Canada since 1946 has been considerable, farm population, in general, and farm labour in particular was not greatly affected.

More interesting details are revealed by a further analysis of the farm labour force by type of worker. The official D.B.S. Labour Force Surveys provide very useful data on persons with jobs in agriculture, classifying them into three groups: (a) self-employed operators, (b) paid workers and (c) unpaid family members. The trends and changes in importance of particular groups are illustrated in Chart 1. Two contrasting trends are noted almost

¹⁴ Ibid., p. 13-14.

CHART 1. PERSONS WITH JOBS IN AGRICULTURE, BY CLASS OF WORKER, (1946-1960).



Source: Special compilation from the D.B.S. Labour Force Surveys.

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immediately: The increasing relative importance of self-employed operators and the decline of unpaid family members. The latter trend is very significant; it indicates that that group seems to have been most affected by the off-farm movement. It is plausible to argue that farmers' children of working age show the greatest mobility as far as seeking jobs is concerned. Better wages and more attractive conditions of employment offered by other industries, the ability of farmers to keep their children longer at school on account of improved income and increased farm mechanization are three main factors which influenced this mobility. The second group, i.e. self-employed operators, increased in relative importance, accounting in 1960 for 12 percent (of all the labour groups together) as compared with only 9 percent in 1946, but its size varied haphazardly throughout the period. In numbers it reached the lowest of 28 thousand persons in 1958 and then increased slightly during the last two years.

2. Relative Importance of Different Age Groups of Farm Workers

In more recent years age distribution data for the Prairie Region farm labour force has become available from the labour force surveys. Although the length of time is not sufficient to establish definite long-run trend

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characteristics, yet the pattern of changes in the different age groups confirms conclusions derived from previous analysis of the farm population movement.

For the Prairie Region as a whole the declining trend is most noticeable in the 14-24 years age group. It seems to confirm our previous statement about the mobility of farm youth. This group shows also a decline in relative importance within the total male labour force, from 24 percent in 1951 to 18 percent in 1960. The "45 years old and over" group, on the other hand, indicates the least decline of all three age groups, and even registered some increase in relative importance (from 34 percent in 1951 to 44 percent in 1960).

On a provincial basis, the largest decline (50 percent) in the 14-24 years age group is noted in Saskatchewan. This province also stands out with respect to the smallest decline in the "45 years old and over" group. The following example best illustrates the exceptional movement of young people from the agricultural labour force: In 1941 there were 95 thousand children of 10 to 14 years of age living in the province. Ten years later only 63 thousand persons 20 to 24 years of age remained in Saskatchewan.

3. Seasonal Employment Patterns

Agricultural employment in general is subject to

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considerable seasonal variations. These variations influence it through the sheer length of the winter season, when activity in the farm labour market is practically at a standstill.

The seasonal pattern of employment in the Prairies is slightly different from the rest of Canada,¹⁵ on account of the short, frost-free growing season. Volume of employment increases rapidly in April and May, reaching its peak in August. After that, it declines even more rapidly until it reaches a trough in February. The average amplitude of seasonal variations (average difference between peak and trough) between 1953 and 1960 was 36 percent. The seasonal amplitude of farm workers shows a tendency to increase over the period, resulting probably from the accelerated farm mechanization. The seasonal amplitude in non-farm employment in Canada of only 5 percent is very low compared with similar swings in agricultural employment.¹⁶

Despite the seasonal variations, the long-run trend of agricultural employment has been progressively decreasing. This has been a direct result of changes in the composition of the agricultural labour force. At present almost 90 percent of this force consists of self-employed operators and

15 Ibid., p. 29.

16 Ibid., p. 31.

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unpaid family members. Of the remaining group of paid workers quite a few seek employment opportunities in other industries during winter months.

4. Agricultural Wages

It has already been mentioned above that one of the reasons behind the off-farm movement of young people is the higher wages offered by industry. Farm wages have been consistently low. There always has been and there still is a considerable difference between the agricultural and industrial wage rate. True, information on farm wages is rather scanty (D.B.S. estimates average farm wages only three times a year) and part of the difference can be explained by the fact that the industrial worker is generally more skilled. But even when we compare the 1952-1960 difference within each series, industrial workers gained considerably more than farm workers. Alberta is the province where the contrast between improvement in non-farm as compared with farm wage rate is the sharpest, as illustrated in Table XXI.

The trend in monthly wages of Prairie farm help shows more improvement than one in hourly wages, partly because the level of farm wages was generally lower in the 1950 base year of this index of monthly wage rates than in 1952.

The 1950-1960 percentage increases on a provincial

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TABLE XXI

Average Hourly Wages of Male Farm Help
and Industrial Worker

Years	Worker Farm Industry MANITOBA		Worker Farm Industry SASKATCHEWAN		Worker Farm Industry ALBERTA	
	\$	\$	\$	\$	\$	\$
1952	.94	1.24	1.05	1.30	1.06	1.31
1960	1.06	1.67	1.12	1.90	1.11	1.90
1952-60 Diff. (%)	12.7%	34.7%	6.7%	46.2%	4.7%	45.0%
9 years average	.96	1.46	1.05	1.60	1.05	1.60

Source: Quarterly Bulletin of Agricultural Statistics,
Ottawa, Queen's Printer, 1960, Table 2.
Also Review of Manhours and Hourly Earnings
1945-1959, Ottawa, Queen's Printer, 1960,
Table 10.

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basis are as follows: Manitoba and Alberta, 36 percent each, Saskatchewan, 44 percent.

The series of monthly wages in Agriculture have certain advantages over an hourly wages series when making comparisons with industrial wages. The latter adhere rather strictly to union rules, which provide shorter hours of work. Agricultural workers, on the other hand, generally put in much longer hours in a week or month, than in a year. Often a farm labourer works a full six-day week. Consequently, a comparison on a monthly basis would seem more meaningful.

5. Labour Legislation

Very little, so far, has been done in the field of labour legislation regulating agricultural employment conditions. Farmers' organizations usually exerting strong political influence have been mainly interested in income stabilization policies, and in the marketing and production fields. They may, also, have felt it was not in their interest, as employers, to sponsor demands for regulating agricultural employment conditions. Farm workers, on the other hand, were too weak and, perhaps, indifferent to organize themselves into unions and press on their demands.

As a result, there has been virtually no legislation pertaining to conditions of farm employment, in contrast to numerous enactments in the non-agricultural field. The only

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legislative provision, which covers farm workers, as well as industrial workers, has been made under the Workmen's Compensation Act. Even then in some provinces compensation action can be taken only upon application by employers.

More recently there has been growing concern over the need for action in this field. With increased farm mechanization more workers capable of handling modern agricultural machinery are demanded. This demand can be satisfied by improving wages and working conditions of agricultural workers.

D. IMPACT OF TECHNOLOGICAL CHANGES

In the early years of the period under discussion the whole Prairie economy was involved in one of the severest depressions on record. Recovery was slow, painful and cautious. A reorganization of farm structure began in the form of a consolidation movement. At the same time more capital was being applied to a slowly increasing land area. This increase in capital has taken the form of additional machines and larger inventories of livestock. At first, the application of additional machines and other means of technology was slow. Prairie farmers were neither in the psychological nor financial position, even half way through the first decade (1931-1940), to adopt many of the technological innovations that were then available. It was only toward

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the beginning of the second decade (1941-1951) that the rapid increase in farm mechanization, in the use of fertilizers, in better plant and animal strains, and better pest and disease control measures took place. This has brought higher yields in cereals and better livestock.

The nutritive quality of pastures and hay has been improved by growing more legumes and grass mixtures. Mechanization made also more efficient silage and hay making. This, combined with scientific in-breeding, has led to a considerable improvement in livestock.¹⁷ One of the most spectacular improvements has been registered by the poultry industry. Egg production per hen, for example, increased from 110 per year in the 1935-1939 period to 171 in 1955. This represents an increase of 55 percent over the twenty year period. Specialization in this industry reached the point where large-scale commercial hatcheries replaced small flocks of the broody hen. Scientific breeding produced high egg-laying breeds. Similar improvements occurred in producing poultry for meat.

Improvements due to technological advances were not confined solely to the field of crops and livestock production. In the field of labour productivity increase in

¹⁷ W. M. Drummond and W. MacKenzie, "Progress and Prospects of Canadian Agriculture", Royal Commission on Canada's Economic Prospects, Ottawa, Queen's Printer, 1957, p. 79-91.

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total output has been obtained in spite of the declining labour force, due to the substitution of farm machinery for the latter. While importance of labour as a production factor in agriculture has been diminishing, output per man increased at a faster rate than either output per acre or output per unit of capital.¹⁸ Some illustration of this increase is presented in Table XXIII, Chapter III, Section 4. According to the unpublished estimates by the Department of Trade and Commerce Gross Domestic Product per agricultural manhour has increased by 107 percent between 1935 and 1955.¹⁹

It is true that technological innovations were one of the most dynamic factors in Canadian agriculture. They were principally responsible for an enormous increase in food supplies, which more than kept pace with increasing population. Through releasing labour from agriculture, technological innovations played a part in the continuously improving standard of living of farmers. However, by creating this "excess capacity" in the farm productive apparatus innovations tend to depress farm prices and result also in low net returns to agriculture. In the final analysis we have a supply function which moves to the right as a result of applied technology and, facing it, an inelastic demand function.

¹⁸ Ibid., p. 81-91.

¹⁹ Ibid., Table 40, p. 90.

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This seemingly evident conflict between progress on the one hand, and the low income problem in agriculture in the other, will probably be with us for some time. It certainly cannot be solved on the domestic level without jeopardizing either technological progress or interfering with the economic forces behind the supply and demand for farm products.

Not much can be done to increase the domestic demand for agricultural produce, because of its relative inelasticity. However, a vigorous policy for expanding export markets could be quite effective. The recent endeavours of the Federal Government in sponsoring "sales of Canadian products abroad" campaign would suggest they are exploring the possibilities of such an expansion programme.

The farmer makes production decisions in an environment where the firm (his farm) and household are closely combined. His primary objective may not be profit alone. Technology may be applied in order to maximize leisure or make work less strenuous.²⁰ Frequently, decisions are made by chance, custom, or other simple reasons, with little economic reasoning employed.

Adoption of technological innovations by farmers often creates a serious problem of adjustment in the farm

²⁰ p. T. Thair, "Adjustments of the Farm to Technology", in Canadian Journal of Agricultural Economics, Vol. VIII, No. 1, 1960, p. 34-40.

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structure. One change usually necessitates changes throughout other parts of the farm business. If the whole series of changes is not completed, a farm programme may suffer from imbalance. The efficient farm operator faced with a new cost structure must continually adjust and reorganize his production programme to maintain an equilibrium position.²¹ That he does not do it often has already been mentioned in the preceding paragraph.

Current wheat surpluses resulting partly from technological improvements and partly from a public policy that attempts to maintain prices and incomes at levels which stimulate production beyond normal internal market requirements, are an important problem facing Canadian agriculture in general, and Prairie agriculture in particular. These surpluses combined with relatively inelastic demand in both home and foreign markets have already led to suggestions that technological advances in agriculture should be slowed down. Such a short-sighted proposal would certainly impair a continuing process of advances in efficiency and productivity of agriculture, which contribute substantially to the growth and development of the total economy.

²¹ Ibid., p. 42.

CHAPTER III

ECONOMIC STATUS OF PRAIRIE FARMERS

INTRODUCTION

In the first two chapters changes in farm population and farm organization were discussed. It was noted that the average age of the farmer during the period 1931-1960 showed a slight increase, but that he remained on his farm for a longer time, and acquired a better education than his predecessors. We also learned that the off-farm movement was taking place at a rate of one percent per annum, and that farms almost doubled in size, and were considerably better managed, mechanized and improved technologically, as compared with those at the beginning of the period under discussion.

This chapter is concerned with analyzing net farm income¹ and its development over the 1931-1960 period. No direct comparison of farm income with the national income will be attempted because of the conceptual differences. However, a comparison in a broad sense is possible and illuminating. For this purpose, the concept of accrued net income of farm operators will be used. The latter is

¹ Net farm income is the total income of farmers from farming operations. It is calculated by subtracting farm operating expenses and depreciation charges from realized gross farm income.

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nearest conceptually to the national income. It differs slightly from net farm income because of certain adjustments made. These adjustments include deductions of imputed net rents, profits of agricultural enterprises, payments under the Prairie Farm Assistance Act, differences in charges in farm inventories and adjustments on grain transactions. Variations in net farm income and its components and the factors behind these variations will be given extensive treatment. An attempt will be made to express the mutual interdependence of these factors and their influence upon farm income by means of functional equations.

Finally, the problem of "low farm income", or, more precisely, the phenomenon of farm income lagging behind national income will be discussed.

A. NET FARM INCOME

1. Difficulties Involved in Conceptual Framework and Method of Computation of Net Farm Income

There seems to be a lack of detailed knowledge with respect to the distribution and comparative level of farm income. We might know, approximately, the total farm income in any given year. We might also know the total number of farm operators and the total number of farm workers, and compute averages of their individual incomes. However, all these estimates are the result of indirect investigations

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and are calculated in terms of current values prevailing at the farm. Further measurement difficulties arise as a result of our imperfect knowledge of the adequacy of these estimates, since many people receive income from both farm and non-farm sources. There are also factors associated with the comparative advantages and disadvantages of farm life which cannot easily be evaluated in monetary terms. The farmer is his own master, and is free to allocate his managerial and productive resources as he sees fit. His life is generally a healthier one than that of a man confined to an office desk, and his children are not forced to make their playground in city streets. On the other hand, the many amenities of city life and city schools are not readily available to the farmer and his family. If the farmer's marginal valuation of the advantages of his occupation is below his valuation of the extra satisfaction another occupation could afford him, he will not remain a farmer. But only he can assess these factors, and because the assessment is purely subjective, it cannot be measured.

In spite of all these shortcomings, aggregate farm income statistics provide reliable information for many purposes. (They are used in National Income calculations, also by provincial and Federal Governments in shaping their farm policy). Conceptual frameworks and methods of collecting data have been improving steadily in response to a

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growing interest and recognition of the importance of farm income in the national economy. This growing concern with the farm income problem coincides with a decrease in the relative share of the National Income accruing to the agricultural sector.

Apart from the measurement problems there are also problems of historical and geographical instability. Historically, this instability is illustrated by the long-run (relatively mild) and short-run (often pronounced) changes in farm income. Geographical instability is manifested in considerable differences in farm income between particular geographical regions or even between individual farmers within a region. Virtually all available statistical data on income pertain to historical variations. There is almost a complete lack of information on regional variations in farm income at specific points in time. Only very recently has serious thought been given to devising an effective method of getting income information directly from the farmers. A great deal of effort will be required to overcome the farmer's resistance to disclose figures concerning his earnings and his suspicion as to the purpose of such an inquiry.

2. Trends in Accrued Net Farm Income

From the depth of the depression and drought in the early thirties accrued farm income for the Prairie Region

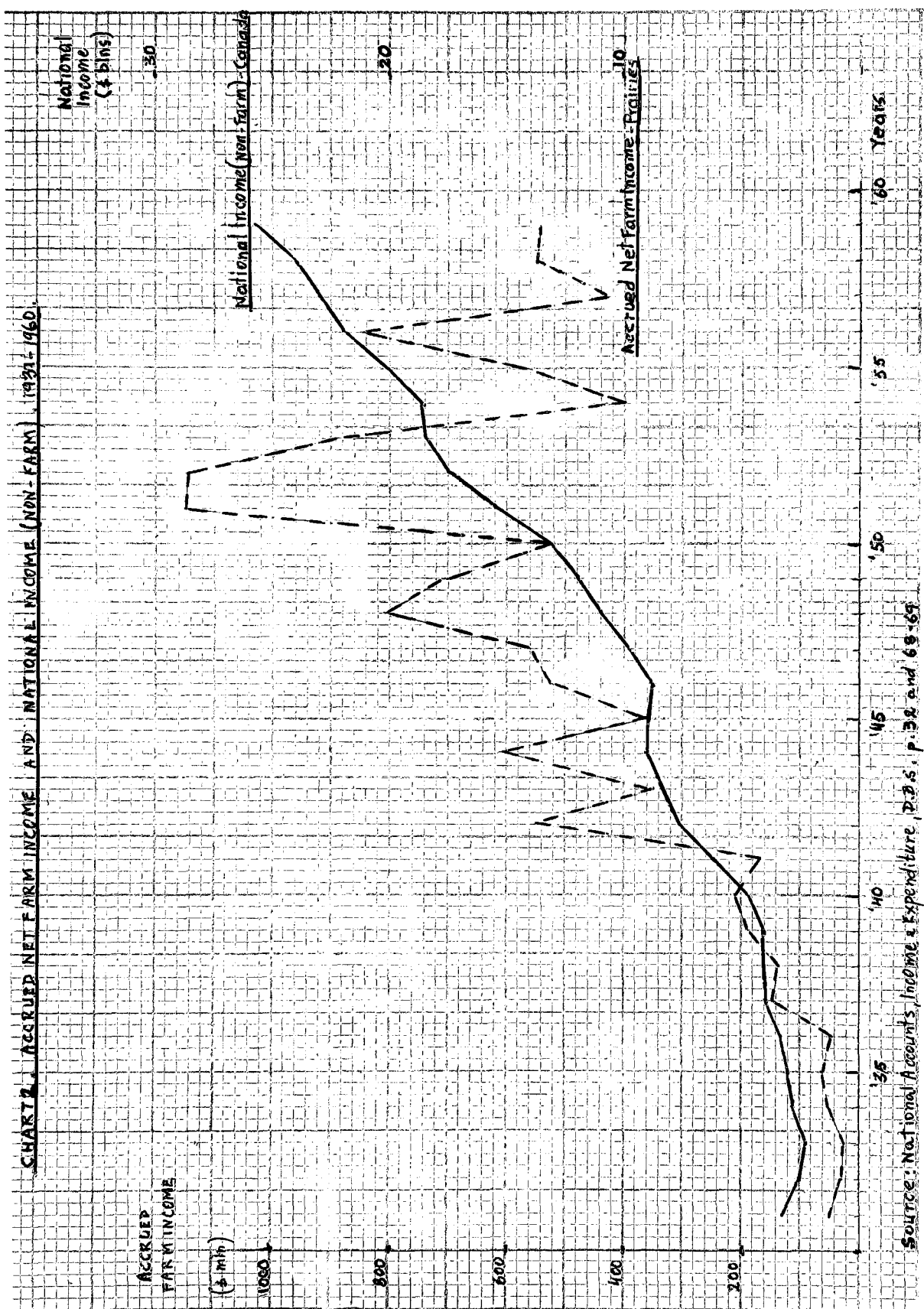
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followed an upward trend to a peak of \$1.2 billion in 1951. From there, the trend reversed, until in 1959 accrued income was slightly above \$0.5 billion. These general movements followed a zig-zag pattern, with trend increments at times exceeding \$200 million, as shown in Chart 2.

For the first (1931-1941) decade accrued farm income of Prairie farmers fluctuated around a low level of \$95 million² and only in the second half showed a decided upturn. During the second (1941-1950) decade it rose to over half a billion dollars, - more than five times the average level for the previous decade. This period included, of course, war years and immediate post-war adjustments, when huge amounts of grain and other agricultural products were shipped to the United Kingdom and devastated Europe. Early in this decade the changing structure of farm production took place to meet wartime needs. In 1941 the Wheat Acreage Reduction Programme started and resulted in considerably reduced receipts from the sale of wheat. This was, however, more than offset by the increased cash from the sales of livestock. The next year, 1942, witnessed a very sharp rise in accrued farm income from \$174 million to \$559 million. This was largely the result of a record wheat crop, and of coarse grain production on a scale yet to be equalled. An

² National Accounts, Income and Expenditure, 1926-1956, Ottawa, Queen's Printer, 1958, p. 68-69.



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additional factor was the very high value of inventory change, which, in Saskatchewan, for instance, reached an all time record of \$184 million.

The third and last decade of the period under consideration is characterized by a spectacular rise and fall in accrued net farm income. The year 1951 is regarded as a record year in farm income history not only for the Prairie Provinces, but for Canada as well. At \$1,152 million, farm income exceeded the billion dollar mark for the first time. The next year, 1952, it dropped only \$6 million. The reasons behind such an unprecedentedly high level of farm income during those two years are not difficult to discern. On the one hand, farm prices rose, on the average, by 14 percent, while, on the other, farm output was 12 percent higher than it had been in the preceding year. This powerful combination of two factors so important to the farm economy was reversed in 1954 and resulted in a precipitous decline of farm net income, which, if measured from the 1952 level amounted to almost \$750 million. This time farm prices dropped by 16 percent, while that of wheat was almost halved. In 1956 farm net income increased to \$843 million as a result of increased production of both grains and livestock, and a temporary levelling out of farm prices. During the next year (1957) another sharp drop occurred to \$422 million, which brought income almost to the 1954 level.

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For the last two years, 1958 and 1959, the level of net farm income remained almost unchanged at \$551 and \$542 million, respectively, while the 9 years average at \$724 million is about \$200 million above the previous decade average.³

Accrued net farm income for each of the three Prairie Provinces displays a rising secular trend and sharp year-to-year changes around it, which is similar to the one already described for the Prairie Region as a whole. However, for Manitoba both the long-run trend and the annual fluctuations appear to be the mildest of the three.

In terms of percentage changes, illustrated in Table XXII, Manitoba also appears to have experienced less abrupt ups and downs.

In contrast to the relatively mild fluctuations of Manitoba's accrued net income, that of Saskatchewan shows sharp 5-year changes accentuated especially during the second and third decades of the period under consideration. Similarly, the long-run trend in accrued net income of Saskatchewan farmers has been rising more rapidly during the second decade only to drop down, also at a greater rate than that of Manitoba, in the third decade. The main reasons behind this different behaviour of farm income in Saskatchewan are the more severe climatic conditions and a

³ Ibid., p. 68-69.

TABLE XXII
Accrued Net Farm Income
Five Years' Averages and Percentage Changes Between the Averages (1931-1960)

Five year Intervals	Manitoba		Saskatchewan		Alberta	
	\$ million	change in percent	\$ million	change in percent	\$ million	change in percent
1931-1935	7.2	-	16.4	-	17.2	-
1936-1940	34.4	378	52.2	218	61.8	259
1941-1945	81.4	137	195.6	275	136.4	121
1946-1950	125.2	52	283.0	45	222.4	63
1951-1955	114.0	-8	424.2	50	293.2	32
1956-1960*	102.0	-11	250.8	-41	229.2	-22

Source: National Accounts, Income and Expenditure, 1926-1956, Ottawa, Queen's Printer, 1958, p. 66-68. Ibid., 1959, p. 40.

* Estimates for 1956-1960 are preliminary.

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greater concentration of agricultural production in grain crops, mainly wheat. Geographically, the province is more exposed than Manitoba to the drying effect of the westerly winds and, consequently, the wider fluctuations in yields. Since the production of wheat has, throughout the period, constituted by far the most important single source of cash income, it is little wonder that yield variations have had a strong influence on accrued farm income.

In Alberta, the long-run trend of accrued net farm income follows a more moderate course than that in the other two provinces. The rate of increase from 1935 to 1951 is almost constant though not as high as that of Saskatchewan, nor as low as that of Manitoba. When comparing five-year averages one notes that up to 1955 each consecutive percentage change is almost exactly half of the previous one. Behind this relative long-run stability of accrued net farm income is the fact that in Alberta, cattle have become equal in importance, and during the last decade, of even greater importance than wheat, as a single source of farm income. Another factor which enabled Alberta's farmers to achieve a certain degree of control over variations in income, despite marketing restrictions on grain, was their ability to switch into hog production. It would seem that a combination of cash crops and livestock production, or in effect, a degree of diversification in agricultural production,

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constitute a reasonable defence against violent income fluctuations.

In contrast to the fluctuating trend of farm income, National Income, (excluding farm income of Prairie farmers), is characterized by a comparatively smooth and upward trend, without spectacular down or up-turns. After a very shallow decline for the first three years of the 1931-1940 decade, it turned slowly upward and in 1940 approached the \$5 billion mark. The average for the decade came to \$3.4 billion. Throughout the second decade the trend continued to rise steadily, with the exception of the year 1946, when it dropped 3 percent below the preceding year's level. The average for this decade at \$9.6 billion is about three times as much as the average for the previous decade. This is quite an imposing rate of growth, (even though no allowance has been made for the change in the value of money), although it does not match farm income, where the average for the second decade was as much as five and one-half times higher than that for the first decade.

This increasing trend in National Income has been maintained for the last 10 years and in 1960 reached a record level of 26.8 billion.⁴ The last decade's average at 21.3 billion is more than twice the size of that of the

⁴ Preliminary estimate (unpublished).

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previous decade. This time National Income growth is considerably higher than that of farm income, where the difference has come to only 38 percent.

An interesting pattern of changes in the share of National Income accruing to Prairie farmers is illustrated in Table XXIII.

From the low level of the depression years the share of National Income falling to Prairie Farmers rose to four percent in the 1936-1940 period, and five percent during the 1941-1945 years. Up to this time the accrued net income of farmers was apparently increasing at a higher rate than the National Income. A rather large increase in the share from 1 percent to 4 percent between the 1931-1935 and 1936-1940 periods can be explained by the abnormally low incomes of Prairie farmers in the first three years, (1931, 1932 and 1933) of the first period. During the last decade, (1951-1960) the Prairie farmers' share in National Income (2 percent) fell almost back to the level of depression years. A partial explanation of this rather abrupt change lies in the fact that farmers generally and Prairie farmers in particular enjoyed a sustained high level of income during the post-war and Korean war period from about 1946 to 1953, which has subsequently dropped very sharply for reasons already given. Another reason is that the number of farmers reached its peak at the beginning of the 1941-1945 period and since then

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TABLE XXIII

Canadian National Income and Accrued Net Income
of Prairie Farmers - (Five Year Averages 1931-1960)

Five Year Intervals	National Income (\$ million)	Accrued Net Income of Prairie Farmers	
		(\$ million)	as percent of National Income
1931-1935	2,855	41	1
1936-1940	4,111	148	4
1941-1945	8,491	413	5
1946-1950	11,796	630	5
1951-1955	18,861	831	4
1956-1960*	24,954	628	2

Source: National Accounts, Income and Expenditure,
1926-1956, Ottawa, Queen's Printer, 1958.

* Estimates for 1960 are preliminary.

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steadily decreased. However, changes in accrued income, looked upon from the point of view of changes in number of farmers, will be discussed more extensively in the following section.

3. Net Farm Income per Farm and per Head of Farm Population, and National Income per Head

Before analysing farm income per head it would be advisable to recall that net farm income does not include any income derived from non-farm sources. However, in spite of this disadvantage, net farm income either per farmer or per head of farm population provides a fair long-run measure of the farmer's financial position.

The different trends in the net farm income in each Prairie province were discussed in previous sections of this chapter. The relative uniformity in both, the rate and direction of farm population and the number of farms was pointed out in chapters I and II. The relative differences in per capita income as between particular provinces, which are illustrated in Table XXIV, should, therefore, be almost entirely due to the changes in the net farm income itself.

Both Manitoba and Alberta experienced an increase in net farm income per farm from the low depression levels in 1931 to the peak of "Korean War period" in 1951 as shown in Table XXIV. Saskatchewan followed almost the same trend

TABLE XXIV

Farm Income per Farm and National Income per Head,
Prairie Provinces and Rest of Canada
(1931-1960)

Agric. Census Years	Net Farm Income per Farm				Net Farm Income per Head of Farm Population				Net National Income per Head*
	Man.	Sask.	Alta	P.P.	Man.	Sask.	Alta	P.P.	
1931	107	228	120	169	23	55	31	41	363
1936	303	129	204	188	67	32	51	46	341
1941	907	481	666	627	211	130	173	162	592
1946	1,946	2,047	2,197	2,077	471	593	586	563	798
1951	3,316	5,006	4,648	4,529	792	1,404	1,135	1,168	1,183
1956	2,648	4,244	3,457	3,636	630	1,211	827	936	1,471
1960**	2,170	3,594	3,161	3,140	521	1,006	739	797	1,580

Source: National Account, Income and Expenditure, 1926-1956, Ottawa, Queen's Printer, 1958, p. 32. Also "Farm Income", Handbook of Agricultural Statistics, Ottawa, Queen's Printer, 1959, p. 32-34.

* Excluding net farm income of Prairie Farm Operators.

** Preliminary estimates (unpublished).

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excepting the year 1936 when the province experienced a severe drought. Up to 1946 Manitoba was leading Alberta and Saskatchewan in income per farm. In that year the situation changed, however, and the latter provinces recorded a larger income per head than Manitoba - an advantage they have since maintained. A partial explanation of this change lies in the fact that although in 1946 the number of farms decreased in all three provinces, in Manitoba this decrease was relatively the smallest. Another factor seems to be the size of the farm itself. Apparently, during the war years and immediately after, when the rates of mechanization and technological development were accelerated, technological efficiency increased with increasing farm size. Although the movement towards larger farms was common to all three provinces throughout the period, yet in both absolute size and relative rate of increase of average farm size, Manitoba lagged behind.

Similar trends can be observed in net farm income per head of farm population. Here again the significant change in the relative position occupied by the provinces came in 1946, when both Saskatchewan and Alberta enjoyed a higher income per head of farm population than Manitoba. All three provinces reached their relative maxima in 1951. From that moment onward income per head declined at an almost equal rate.

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The rate of greatest increase in both net farm income per farm and per head of farm population for Manitoba came in the period between 1936 and 1941, while for Saskatchewan and Alberta the period of greatest increase prevailed a little later, between 1941 and 1946. For the whole Prairie Region both net farm income per farm and per head increased most rapidly during the same period, i.e., between 1936 and 1941.

Coming now to the relative movement in Canadian National Income per head, the first thing one notices, is the steadiness, except for the period 1931 to 1936 when it decreased slightly on account of a drop in prices.⁵ From 1936 to 1960 it has been on a continuous rise; it accelerated somewhat under the inflationary impetus of the 1941 to 1951 "war" decade, then slowed down a bit during the last decade.

There should be some qualifying remarks made when comparing trends and absolute levels in net farm income per head and national income per head. Firstly, in a precise analysis, it is the marginal returns rather than the average returns that should be compared,⁶ and a concept of "income per head" is a concept of average return. Average returns

⁵ National Income in constant dollars for 1931 and 1936 years in terms of index numbers (1949 = 100) reads 46.3 and 49.1 respectively.

⁶ Although difficult in practice, in theory it is possible to compare the effects of equal increments to the totals of both farm income and national income.

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equal marginal returns only under conditions of perfect competition and even in agriculture, competition cannot be regarded as perfect. Secondly, farm and non-farm income data are not directly comparable. Both types of income are measured in terms of money and this leaves out important non-pecuniary factors. There is no reason why these factors should cancel each other, when a comparison is made. Apart from that, farm and non-farm averages cover such a diversity of original data that it is difficult to make a direct comparison. Only when one is fully aware of what is included in each set of data and how they have been processed, can one make a comparison, and then only in a broad sense.

In Table XXIV we have two types of farm income: Per farm and per head of farm population. It is the latter type, i.e. farm income per head of farm population which is more suited to the broad comparison with non-farm income (National Income excluding net income of Prairie farmers) per head. If we consider the Prairie Region as a whole, we find that throughout the entire period non-farm income per head was at a higher level than farm income per head. The only time when the latter even approached the former was in 1951, when there was about \$20 difference. Otherwise, net farm income per head of the Prairie farm population remained at about half of the level attained by non-farm

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(National) income per head. Only Saskatchewan achieved a level of farm income higher than non-farm income. This occurred only once in 1951.

B. MAJOR COMPONENTS OF AGGREGATE FARM INCOME

1. Changes in Relative Importance of Various Components

In calculating net farm income from farming operations, cash income, income in kind and supplementary payments are totalled and from this, inventory changes are subtracted (or added) and, in the final step, operating expenses and depreciation charges are deducted. Thus, net income estimates make allowances for farm production that exceeds sales and home consumption during the year (whenever inventory changes are added) or for sales and home consumption in excess of current production (causing inventory changes to be subtracted).

In Table XXV all components of aggregate farm income, i.e. cash income, income in kind, supplementary payments and value of inventory changes are given as percentages of gross farm income. The first four component percentages add up to 100 because they constitute gross income, while the depreciation charges and net income are presented separately.

Gross farm income for the Prairie Provinces increased from about 312 million dollars per annum in the decade from

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TABLE XXV

Aggregate Farm Income Components,
Ten-Year Averages (1931-1960)

	1931-1940	1941-1950	1951-1960
Cash Income	81.0	91.0	86.5
Income in kind	17.0	9.5	8.5
Supplementary payments	.5	2.5	1.5
Value of inventory change	1.5	3.0	3.5
Gross Income	100.0	100.0	100.0
	<u>\$ million</u>	<u>\$ million</u>	<u>\$ million</u>
Operating expenses and	312.5	961.0	1,445.4
Depreciation changes	233.4	414.7	703.1
Net Income	79.1	546.3	742.3

Source: "Farm Income", Handbook of Agricultural Statistics, Ottawa, Queen's Printer, 1958, p. 32-34.

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1931-1940 to about 1,400 million per annum in the last decade, 1951-1960. This almost 5-fold increase was brought about partly by the greater volume of sales but also by the higher prices received by farmers. Towards the end of the last decade, prices stood at a level two and a half times higher than that of the early thirties.

By far the largest part of gross farm income can be accounted for by receipts from the sale of farm products. It is interesting to note, however, that although cash income fluctuated considerably throughout the 30 year period, it maintained its share of gross farm income at close to 90 percent. Its 1951-1960 annual level in dollars increased 6 times over that in the 1931-1940 years. The contribution of the next component, that is, income in kind, dwindled from 17 percent in the 1931-1940 years to 8 percent during the last ten years. Sharp fluctuations in the value of inventory changes from minus 200 million dollars to plus 300 million represent changes in stocks of grain or "carry-over" on farms. Supplementary payments increased considerably from about 2 million to 33 million dollars⁷ and although they represent a relatively insignificant part of gross income, the increase reveals a more comprehensive assistance programme

⁷ "Farm Income", Handbook of Agricultural Statistics, Ottawa, Queen's Printer, 1958, p. 32-34.

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to Prairie farmers on the part of the federal and provincial governments.

On the other side of the ledger, farm operating expenses and depreciation charges increased from 233 million to 703 million dollars or about three and a half times over the same period. This rate of increase is only a little more than half that of cash income. Over the whole 1931-1960 period operating expenses have been increasing at an average rate of 6.7 percent per annum.

2. Variations in Cash Income

The relationship between the Prairie Provinces, as far as the variations in their cash incomes is concerned, is slightly different than the relationship observed earlier in this chapter when net farm income was being considered. Manitoba this time shows more uniformity of movement with Saskatchewan, while Alberta stands apart as indicated in Table XXVI.

The first two provinces have an almost identical pattern of cash income changes, increasing rapidly in the first two decades (1931-1960), then progressing at a slower rate to the peak of the 1951-1960 decade. The cash income of Alberta's farmers shares with the other two provinces an increasing pattern during the 1931-1950 period, yet this increase is not so pronounced.

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TABLE XXVI

Cash Income from the Sale of Farm
Products-Ten-Year-Averages
(1931 - 1960)

Years	Manitoba	Saskatchewan	Alberta	Prairie Provinces
1931-1940	48,494	104,906	100,480	253,879
1941-1950	169,434	395,209	304,873	869,516
1951-1960	219,346	580,635	452,624	1,252,606

Source: "Farm Income", Handbook of Agricultural
Statistics, Ottawa, Queen's Printer,
1958, p. 50-53.

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The cause and effect relationship of these variations in averages is easier to determine than it was in the case of net farm income. There are two main factors which influence the behaviour of farm cash income; the prices of agricultural output and the amount of output - these factors naturally, affecting one another. All three provinces reach their maximum in cash income during the 1951-1952 years, the Korean War years.⁸ During this period both index numbers of farm prices and of agricultural output also reach their maxima.

These changes in cash income averages were sizeable enough, but they seemed, with few exceptions, to point in one direction: up. The inherent instability of farm cash income, however, is fully manifested in short run year to year fluctuations. For Manitoba the range of annual fluctuations extends from -16 percent in 1935 to +57 percent in 1937.⁹ For Saskatchewan the range is from -33 percent to +70 percent in 1939, while in Alberta fluctuations range from -20 percent reached both in 1950 and 1954 to +51 percent in 1944. Year to year changes vary (for the whole Prairie Region) from -28 percent in 1954 to +52 percent in 1944. The abruptness of these ups and downs in cash income stands

⁸ Ibid., p. 32.

⁹ Ibid., p. 33-34.

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in sharp contrast to the annual rate of change (steadily increasing) of non-farm (net National) income which was discussed at the beginning of this chapter.

The reason for this farm cash income instability lies, as noted above, in the instability of farm output and of the prices received by farmers for their products. In Table XXVII these prices are compared with the prices of goods the farmers purchase.

The comparison had to be carried out for Western Canada which apart from the Prairie Provinces includes also British Columbia, because no separate data are available on a provincial basis. Year to year fluctuations in prices received by farmers are quite sharp with frequent ups and downs. These fluctuations have been averaged over the five year periods irrespective of sign in order to have a better appreciation of the amplitude of the changes. A similar operation has been carried out with prices paid by farmers for the goods and services they purchase. When comparing these two sets of figures side by side we see quite a substantial difference. The latter move more slowly and the amplitude of their movement is considerably smaller. Only during the years following the second world war (1947, 1948, 1949) and during the Korean war do they move sharply, and even then the prices received by farmers fluctuate more.

Variations of farm output are the second important

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TABLE XXVII

Annual Fluctuations* of Prices Received and Paid by
Farmers, Five-Year Averages - Western Canada
(1935-1960)

Years	Prices Received by Farmers	Prices Paid by Farmers
	%	%
1931-1935	n/a	3.2
1936-1940	19.9	3.4
1941-1945	20.5	6.3
1946-1950	14.2	11.5
1951-1955	19.6	7.3
1956-1960	5.8	5.7

Source: D.B.S., Index Numbers of Farm Prices of
Agricultural Products, 1935-1960, Ottawa,
Queen's Printer, 1960. Also Price Index
of Commodities and Services Used by Farmers,
1931-1960, Ottawa, Queen's Printer, 1960.

* Signs neglected.

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factor influencing stability of farm income. The variations and the real farm income are illustrated in Table XXVIII. The commodities included in the index are major items of agricultural production which are sold on the market. Excluded are goods used as feed for livestock and the less important products.

Saskatchewan farm output experienced the sharpest fluctuations of all three provinces. In contrast agricultural output in Manitoba was subject to comparatively mild fluctuations, while that of Alberta was somewhere in between these two extremes. A plausible explanation of the relative position of each province with respect to the size and frequency of variation in farm output seems to be climatic and soil conditions. Both Saskatchewan and Alberta are more exposed to extreme weather conditions (drought) than Manitoba. In addition, comparatively lighter soils in the former provinces suffer more from lack of moisture than in Manitoba, which has a greater area of heavy dark brown and black soil. Notwithstanding these interprovincial differences the fluctuations in farm output for the whole region are substantial and constitute, as has already been noted above, one of the major factors in the instability of farm cash income.

In order to see more realistically how well off Prairie farmers really are, cash income data have been deflated with the index of prices paid for their purchases.

TABLE XXVIII

Farm Cash Income in Constant Dollars and Index of Farm Output
(1935-1939 = 100) - Five Year Averages (1931-1960)

Years	Manitoba		Saskatchewan		Alberta		Prairie Provinces	
	\$ mil.	Output Index	\$ mil.	Output Index	\$ mil.	Output Index	\$ mil.	change
1931-1935	35	n a	90	n a	84	n a	209	
1936-1940	61	111.5	120	111.7	116	112.9	298	-43
1941-1945	100	144.4	246	164.3	180	122.5	527	-77
1946-1950	122	133.7	274	139.0	220	115.4	616	-17
1951-1955	100	134.3	268	208.5	199	150.2	567	- 8
1956-1960	89	150.9	233	172.9	191	139.3	514	- 9

Source: D.B.S., Price Index of Commodities and Services Used by Farmers, 1931-1960, Ottawa, Queen's Printer, 1960. Also, "Farm Income", Handbook of Agricultural Statistics, Ottawa, Queen's Printer, 1958, p. 50-55.

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The index includes prices of equipment and materials used by farmers, agricultural labour wage rates, and interest rates, food and clothing and other miscellaneous items usually purchased by farmers.

From Table XXVIII we can see the improvements in the Prairie Farmer's cash income in constant dollars up to the 1946-1950 period. From then on farm income has been declining in all three provinces. The rate of decline comes to about 8 1/2 percent every five years for the region. If we consider at the same time changes in farm population (decreasing trend) we are still left with a declining real farm cash income per head from the peak it reached in the 1946-1950 period. In actual figures, (not deflated), the real farm cash income per head of farm population (in terms of five years averages) increased from a low of \$169 in 1931-1935 to a high of \$639 in 1946-1950 and then decreased again to \$589 in the last five year period (1956-1960).

3. Changes in the Main Components of Cash Income

It has often been said that the Prairie economy is a one crop economy with the reference being made to wheat. After inspecting more closely the composition of the Prairie farmer's cash income, however, one discovers that this is an overstatement, at least in the case of Manitoba and Alberta.

Table XXIX indicates the importance of the two

TABLE XXIX

Contribution of Crops and Livestock to Cash Income,
Percentages, Five-Year Averages (1931-1960)

Year	Manitoba		Saskatchewan		Alberta	
	All Crops	All Livestock and Products	All Crops	All Livestock and Products	All Crops	All Livestock and Products
1931-1935	53	46	75	25	66	34
1936-1940	57	42	73	27	60	40
1941-1945	51	49	69	31	45	55
1946-1950	59	41	73	27	55	45
1951-1955	56	44	78	28	54	46
1956-1960*	49	51	71	29	43	57

Source: "Farm Income", Handbook of Agricultural Statistics, Ottawa, Queen's
Printer, 1958, p. 50-55.

* Preliminary estimates.

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component groups of farm cash income: crops and livestock. In Manitoba the contribution of each of these two main groups to cash income is on an almost fifty-fifty basis. It is only towards the end of the last decade that the share of cash income resulting from the sale of livestock and livestock products exceeds the share resulting from the sale of crops. In Alberta the shift in importance from crops to livestock is more pronounced, although the trend there is rather erratic. During the war years (1941-1945) there was a sudden increase in hog production which resulted in the livestock group contributing more to cash income than all crops. Saskatchewan, on the other hand, provides us with a good example of a one-crop economy. Approximately three quarters of Saskatchewan's farm cash income came from the sale of grain crops, and this ratio has been preserved, virtually unchanged, throughout the 30-year period.

More light is shed on the composition of cash income when the relative importance of single items has been considered. In Table XXX, some of these items have been selected according to their importance. In Manitoba the most important single item is wheat which accounts for about a quarter of the cash income. In Saskatchewan during the first decade (1931-1940) wheat accounted for as much as 65 percent of the cash income. This share has since decreased to about 50 percent, while the contribution of beef

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TABLE XXX

Percentages of Main Components of Farm Cash Income
Ten-Year Averages (1931-1960)

Province	Years	Wheat	Beef Cattle	Hogs	Other
Manitoba	1931-1940	40.4	13.4	8.1	38.1
	1941-1950	25.7	14.5	11.4	48.4
	1951-1960	20.4	16.6	8.4	54.6
Saskatchewan	1931-1940	65.3	8.3	6.2	20.2
	1941-1950	45.5	12.0	8.4	34.1
	1951-1960	46.5	12.6	4.6	36.2
Alberta	1931-1940	54.7	10.2	13.8	21.3
	1941-1950	30.3	16.0	21.7	32.0
	1951-1960	24.4	21.7	15.4	38.5

Source: "Farm Income", Handbook of Agricultural Statistics, Ottawa, Queen's Printer, 1958, p. 50-55.

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cattle has displayed the opposite trend; from 8 percent in the first decade it increased to 12 percent during the last. It appears that the individual farmer in Saskatchewan is beginning to realize that livestock production can be more profitable to him than the production of grain. In this respect he is influenced by the success of his neighbor in Alberta, where, while the importance of wheat as a single contribution item to cash income more than halved from 57 percent in the early thirties to 23 percent in the late fifties, that of beef cattle increased during the same period from 7 percent to 26 percent. This four-fold increase resulted in the promotion of beef cattle to the point where they became the most important single component of cash income. At the same time, Alberta's farmers are paying closer attention to the production of hogs than are the farmers in the other two provinces. Receipts from the sale of hogs in Alberta constitute the highest contribution to cash income in all three provinces and the last ten years (1951-1959) average came to 16 percent. Together with beef cattle they account for almost half of the cash income in Alberta.

4. Changes in Income in Kind

The term "income in kind" applies to that part of farm output which is consumed by the farmer and members of

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the farm household. This output may be consumed either in its original state or after it has undergone a certain degree of processing. The main groups of items consumed on farms are: food, shelter and fuel. Not so long ago farms were almost self-sufficient in regard to these items. However, with the agricultural "revolution" farm living as well as farm output was affected. In this sense changes in income in kind indicate the impact of the technological "revolution" on the Prairie farmer's way of life.

In computing income in kind almost every item bought or produced on the farm has to be apportioned into the part used on the farm and the part sold off the farm. A multitude of decisions as to the quantities, prices and values must be made and judgment pronounced in the case of commodities difficult to market. This applied particularly to the computation of a rental value for the farm dwelling, which is a complex calculation.

There are two factors which greatly affect "income in kind" annual estimates: (1) A change in number of farms and (2) consumption habits. This was particularly true of the period 1941 to 1951 when the number of farms declined partly as a result of a change in definition. The change in itself necessitated substantial adjustments to the income in kind series.

Table XXXI shows that on a component basis house

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TABLE XXXI
Percentages of Principal Components of Farm Income in Kind
Five-Year Averages (1931-1960)

5-Year Intervals	Dairy Products	Poultry & Eggs	Meat	Fruits and Vegetables	Other Products	House Rent
1931-1935	17	9	10	14	9	41
1936-1940	19	12	12	16	8	33
1941-1945	16	18	15	18	8	25
1946-1950	16	15	17	17	5	30
1951-1956	14	16	15	16	5	34
1956-1960*	13	12	15	17	4	39

Source: "Farm Income", Handbook of Agricultural Statistics, Ottawa,
Queen's Printer, 1958, p. 64-66.

* Preliminary estimates.

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rent has occupied since 1931, the most prominent position in the "income in kind" of Prairie farmers. In terms of five-year averages its percentage share in income fell from a high of 41 percent in the 1931-1935 years to 25 percent in the 1941-1945 period, but then returned almost to the previous level during the last four years.

This variation partially reflects changes in costs of repairs, depreciation and return on investment and taxes. It also reflects the fact that during the war years there was not much activity in the construction of farm buildings, while in the post-war decade a feverish boom in urban residential housing affected adversely the rural sector.¹⁰ Fruits and vegetables occupy the second most important position in "income in kind" statistics, although on-farm consumption of these products has fallen off by 3 percent over the 1931-1960 period.

The relative changes in the share of "income in kind" held by meat and "other products", (which include mainly forest products, or, more specifically, wood for fuel) offer an interesting example of diametrically opposite trends. While the farmer's consumption of meat products produced on the farm increased by 5 percent over the 1931-

¹⁰ Urban market competed much more successfully against the rural market for scarce labour and building materials.

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1960 period, the use of "other products" declined by the same amount. This, apart from relevant price movements, indicates the growing importance of meat in the Prairie farmer's diet, and the replacement of wood by other types of fuel in his household.

Of the remaining components of "income in kind", dairy products declined in relative importance by 4 percent over the 1931-1960 period, while poultry and eggs, having reached the peak of their share during the war years, eventually settled down at a level slightly higher than that reached in the early thirties.

On a provincial basis there are some slight differences in the order of importance of the components of "income in kind", except for house rent, which is normally the largest. Manitoba follows, rather closely, the pattern already described for the Prairies. In Saskatchewan a trend towards more meat consumption is apparent, while in Alberta the contribution of fruits and vegetables to "income in kind" is larger, percentage-wise, than in any other Prairie province.

The relative importance of "income in kind" as a component of gross farm income decreased for the Prairie Region from 19 percent in the 1931-1935 years to a low of 9 percent during the last five years (compare Table XXV). On a provincial basis its importance in 1960, as a percentage

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of gross farm income, was as follows: Manitoba 10 percent, Saskatchewan 7 percent, and Alberta 8 percent. These are the lowest figures in all the Canadian provinces. "Income in kind" in the Maritime Provinces, for instance, was as high as 25 percent of gross farm income, and it was not much lower in Quebec.

These variations in the proportion of the farm-produced "income in kind" to gross farm income appear to be related to the type of farming and climate prevailing in a given region. The Prairie Provinces with their more vigorous climate have a more restricted range of products, particularly fruits and vegetables, which must be grown during the comparatively short frost-free season. At the same time, large scale farming is inherently unsuitable for raising most of the food normally consumed on the farm.

The declining trend in importance of "income in kind" appears to be strongly associated with specialization in agricultural production. It seems to be easier now for the farmer, or rather for his wife, to buy factory processed fresh, frozen and canned food items and substitute them for farm-grown foods. The former offer more choice and take less time to prepare. This, in turn, means abandoning farm production of foods for home consumption and concentrating on production for the commercial market. It is no coincidence that in the Prairie Provinces, with their large scale farming

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and high degree of specialization, "income in kind" constitutes a smaller proportion of farm income than it does in any other part of agriculture in Canada.

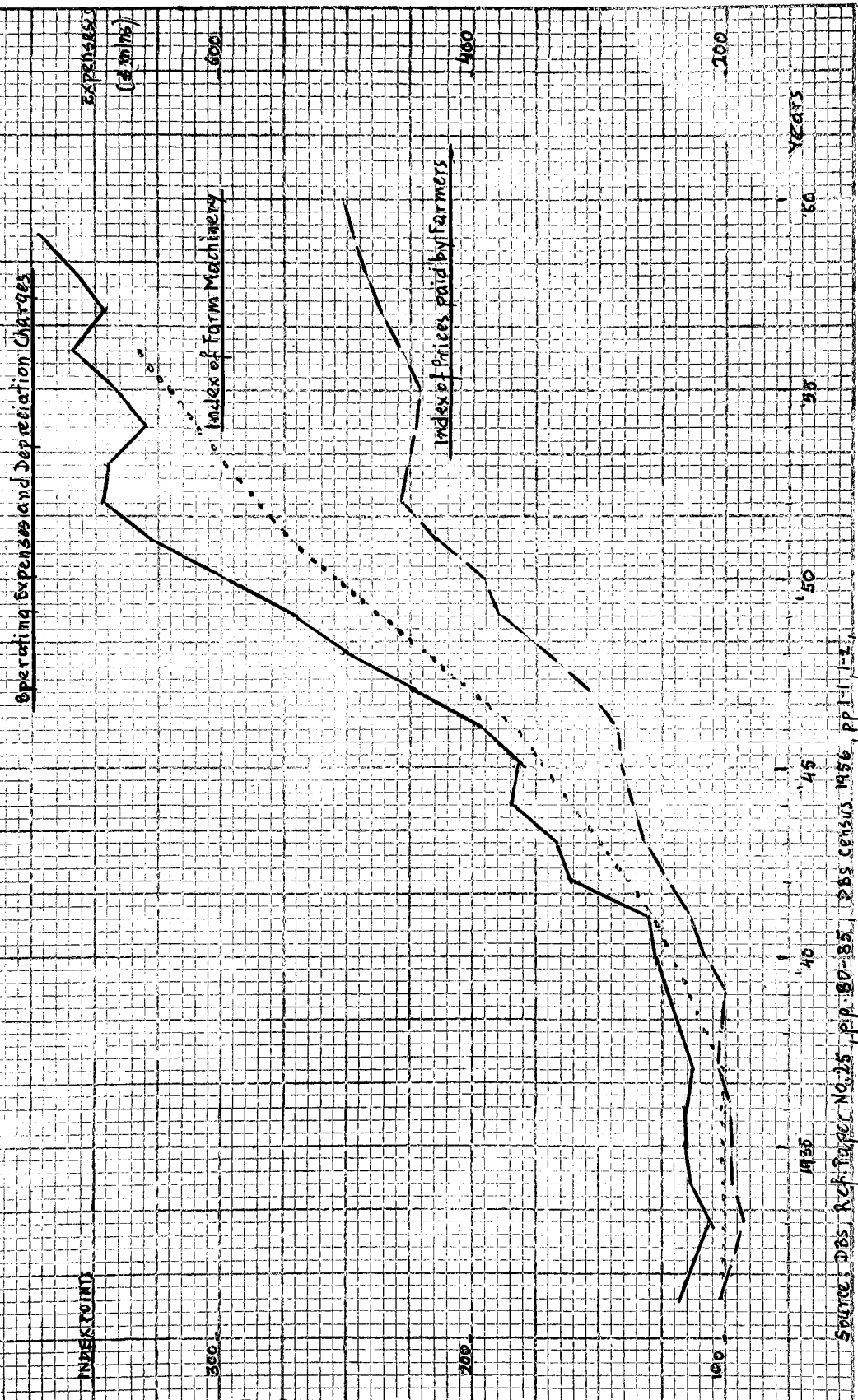
5. Changes in Farm Operating Expenses

The level and variations in the level of the farmer's capital assets have an important bearing upon net farm income. In this analysis farm operating expenses will be regarded as capital input, although they do not cover all farm capital. Changes in operating expenses can be regarded, then, as changes in farm capital input. Land is normally regarded as a "fixed cost" item, as are the farmer's buildings and machinery. They all represent costs which do not change with a change in output and, if output fell to zero, they would still be there, representing a definite "cost" to the farmer.

Chart 3 illustrates a trend in operating expenses and depreciation changes of Prairie farmers for the 1931-1959 period. During the first decade there is not much movement. However, starting from 1941 operating expenses rise sharply and continue to rise until 1952, with the exception of a temporary decrease in 1946. From then on variations are more pronounced, but the overall trend is still rising, although not so steeply, until the end of the period.

Expressed in five-year averages operating expenses

CHART 3. OPERATING EXPENSES AND INDEXES OF FARM MACHINERY (1936=100) AND PRICES PAID BY FARMERS (1925=100).



SOURCE: DBS REF. PAPER NO. 25, P. 80-85, DBS CENSUS 1956, PP. 1-2.

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experience a very high rate of increase in the 1946-1950 and 1951-1955 years. These were post-war years and apparently farmers influenced by the relatively high level of their incomes decided to expand their scale of operations by making additional investments. Interesting changes are registered by some of the components of farm expenses. Expenditure on hired labour, for instance, dropped from 14 percent to 8 percent during the whole period, while sums spent on purchases of farm machinery, in both absolute figures and as percentages of total expense, increased considerably. A similar increase, although not as large, is noted for feed and seed. This appears to indicate that Prairie farmers have achieved an increase in the scale of operations by employing factors of production other than labour. Whether they were forced to do so by an off-farm movement of agricultural workers, or whether they just searched for a more economical combination of inputs, it is not easy to say.

Of the three provinces it was Manitoba that experienced the largest drop in expenditures in hired labour, from 15 percent in the 1931-1935 period to 7 percent in the 1956-1959 years. One of the main reasons must have been the increasing attraction of the Winnipeg industrial area to agricultural workers. Alberta, on the other hand, was the province where the increase in purchase of farm equipment was the highest. Purchases of tractors and trucks increased

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from 8 and 2 percent respectively of total operating expenses in the early thirties to 15 and 8 percent during the 1956-1959 years.

The pressure to substitute farm machinery for farm labour was strongly felt during the "war" decade from 1941 to 1951 when the labour shortage was greatest. Up to 1946 operating expenses per farm increased by 69 percent and from then to 1951 by a further 79 percent. During only ten years the average farm expenditure increased more than three times from \$877 to \$2,650 per farm. This represents quite a high level of capital input and one of the highest in any province in Canada. The only other province which, at that time, approached this high level was Ontario.

In Table XXXII we have farm operating expenses expressed as percentages of farm cash income. In the "lean" years, from 1931 to 1935, expenses were higher than cash income. In Saskatchewan, expenses were almost one third higher than cash income, while Manitoba followed with a 10 percent difference. It was only in Alberta that farmers managed to keep expenses slightly below the level of their cash income during the 1931-1935 years. For the remaining length of the period the operating expenses of the Prairie farmers were kept below cash income (in terms of five-year averages).

Under normal conditions the high ratio of operating expenses to cash income would indicate a great deal of

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TABLE XXXII

Farm Operating Expenses as Percentages of Cash Income,
Five-Year Averages (1931-1959)

Years	Prairies	Manitoba	Saskatchewan	Alberta
1931-1935	110.8*	110.2*	128.6*	93.6
1936-1940	78.6	69.2	92.0	70.4
1941-1945	47.8	48.6	47.5	47.8
1946-1950	47.6	49.4	47.4	46.9
1951-1955	53.6	60.8	50.0	54.8
1956-1959**	46.4	53.4	44.4	45.6

Source: "Farm Income", Handbook of Agricultural Statistics, Ottawa, Queen's Printer, 1958, p. 80-85.

* When Income in Kind and Supplementary Payments (Payments made under the provisions of the Prairie Farm Assistance Act, the Prairie Farm Income Plan and the Wheat Acreage Reduction Programme) are added to Cash Income (constituting Realized Gross Income) then operating expenses will be smaller than the Realized Gross Income.

** Four-years average.

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technical improvement as has already been mentioned at the beginning of this section, requiring heavy outlays on farm machinery, fertilizers, special feeds, and so on. However, in this case the high ratio in the first two five-year periods indicates exceptionally low cash incomes. This is supported by the fact that for the rest of the period under analysis the ratio in Manitoba with relatively higher specialization in agricultural production, is higher than that in Alberta, which, in turn, has a higher ratio than Saskatchewan. In the latter provinces, the farmer finds it to his advantage to spread a considerable part of his fixed costs over a larger output of a single crop, (wheat) and he does it by increasing the size of his farm.

C. CONCLUDING REMARKS

1. Imperfections in Measurement of Net Farm Income

At the beginning of this chapter some major inadequacies in the measurement of net farm income were mentioned. In the final analysis this measurement involves treating agriculture as though it were a single large industry. Its gross income, its production expenses, and its net income are estimated from a wide variety of data on prices, farm production, and marketings. The end result, the aggregates, are not complete because they do not include, for instance, off-farm earnings. These earnings for certain categories

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of farmers, who may be clustered in particular areas, often constitute a considerable part of their total incomes. This problem is illustrated by the incidence of part-time farming which is usually associated with small scale farms. Small farmers often combine seasonal farming occupations with others such as logging, construction, or fishing. In addition, retired persons may engage in farming to an extent that barely brings them within the census-defined class of farmers. Yet all these small scale farm receipts are accounted for in the official income statistics and their number affects the averages.

The importance of part-time farming in the three Prairie Provinces is illustrated in Table XXXIII.

The percentage of part-time farmers is low for the Prairie provinces, compared with a figure approaching 20 percent for the Maritime provinces and one only slightly smaller for British Columbia and Quebec. In these provinces calculation of average farm income is considerably more influenced by part-time farming than in the Prairies.

Another serious disadvantage of net farm income statistics is the lack of size distribution data. In any comparison of average incomes information as to the size and distribution of income among the various sectors is important. Unfortunately, no such data is available in official statistics in Canada. More thought is being given

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TABLE XXXIII

Total Occupied Farms and Part-time Farms
(1951 and 1956)

Province	Total Occupied		Part-time		1951	1956
	1951	1956	1951	1956	Percentage	Percentage
	Numbers		numbers		of Occupied	
Manitoba	52,383	49,201	3,271	3,738	6	7
Saskatchewan	112,018	103,391	4,376	3,726	4	4
Alberta	84,315	79,424	5,118	6,391	6	8

Source: D.B.S., Census 1956, Vol. 10, p. 7-28,
Vol. II, p. 13-1.

to these matters at present in official circles.

2. Types of Differences in Farm Incomes

The subject matter of the preceding analysis in this chapter represents a study of the variations in farm income of the Prairie farmer as they occurred over the last thirty years. Another type of study, and a very interesting one, is a profile analysis. This involves a study of farm income at a given point of time. The latter type is essentially of a static character as distinct from the former, dynamic type.

The profile analysis reveals simply two types of differences within farm incomes. In the first category there are included income differences between separate regions, not necessarily coinciding with such administrative boundaries as occur between provinces. These regions can be distinguished by a combination of physiographic and climatologic characteristics. Although these characteristics do not respect interprovincial boundaries (witness, for instance, soil zones in the Prairies which stretch through all three provinces, or a famous "drought triangle" which includes the south-western part of Saskatchewan and south-eastern Alberta), yet the Prairie Region as a whole is well defined and sufficiently differentiated from the other parts of Canada.

The second category of farm income differences may

occur within regions or even within smaller relatively homogeneous farming areas. They can be identified as normal characteristics of income distribution and are discussed more extensively in one of the following sections as a low income problem.

3. The Main Factors Influencing Size of Net Farm Income

From the analysis carried out in this chapter it is clear that the level of net farm income depends on the following main factors; the price level (including both prices received and prices paid by farmers), farm output, farm input and farm management. Apart from exercising a strong influence on the amplitude and direction of farm income fluctuations, these factors are, to an extent, mutually determining. This interdependence of factors can be conveniently expressed in the following set of equations:

$$F = f(o, i, m, p) \dots \dots \dots (1)$$

$$F = f(y, e) \dots \dots \dots (2)$$

Where "o" stands for output, "i" for input, "m" for management, "p" for price levels and "F" for net farm income, in the first equation, while in the second equation, "y" means gross farm income and "e" operating expenses and depreciation changes. All the factors and their interdependence should be considered against the agricultural background; for instance, farm output would not only depend on input, and

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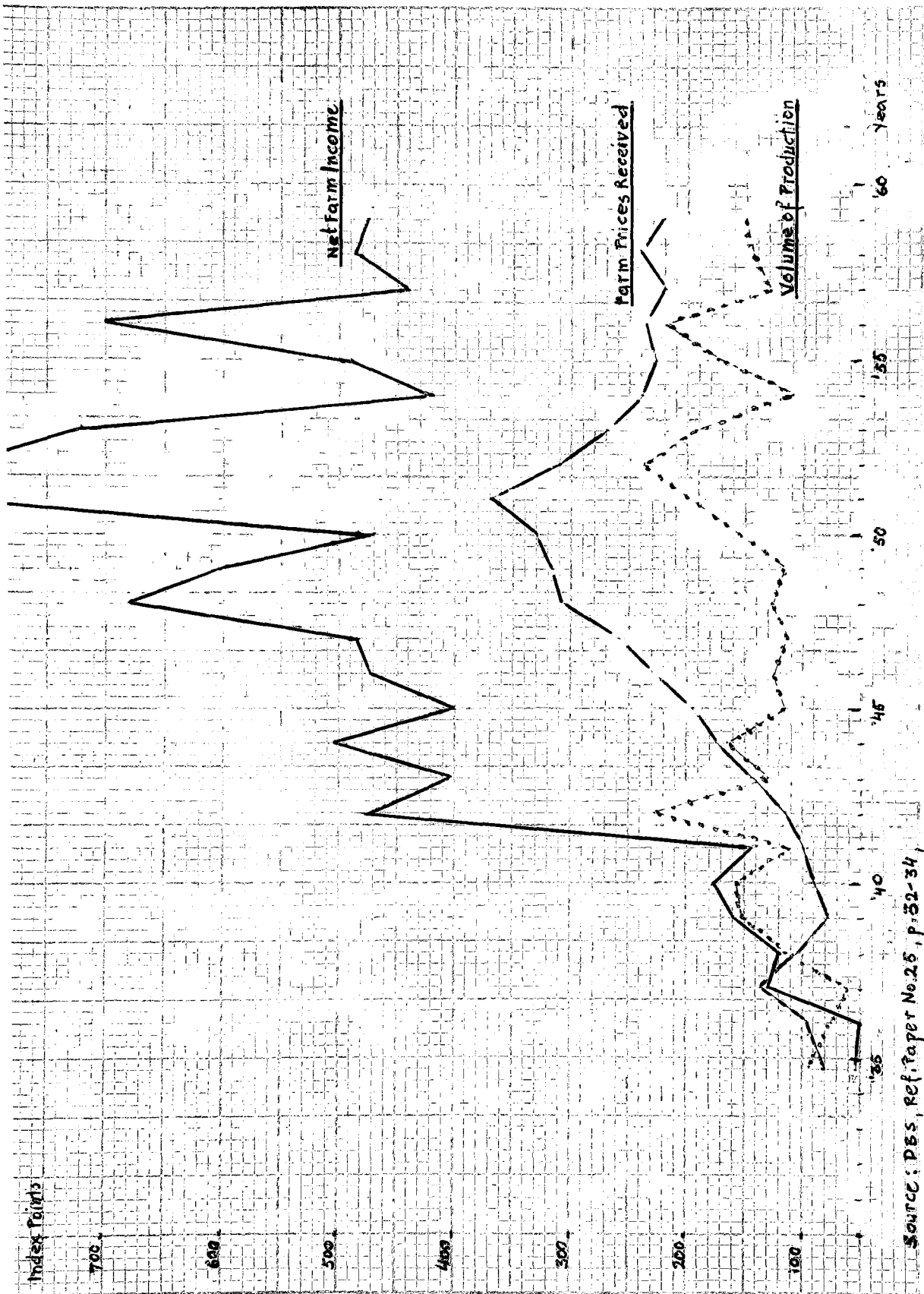
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management, but also on such physiographic factors as: rainfall, number of frost-free days and soil composition.

Chart 4 illustrates the impact of two of the above-mentioned factors, that is, prices and output, on net farm income. It is surprising how closely variations in the volume of output are mirrored in the variations of farm income, especially changes in direction. The level of prices received by farmers seems to be more responsible for pushing the general level of income up or pulling it down, rather than account for year to year changes.

In the previous Chart 3, there are also illustrated the effects of prices of goods and services purchased by farmers and that part of input which is expended on farm machinery. Here prices paid by farmers seem to influence more year to year changes in income, while physical volume (in index form) of machinery is responsible for the general trend and the level of farm operating expenses.

The effects of all four factors (i.e. the price level, farm output, farm output, and farm management) on farm income can be more accurately evaluated by first, deflating the cash income series with the index of prices received by farmers, then deflating operating expenses and depreciation changes with the index of prices paid by the farmers, and deducting both from net farm income. The effect of farm management does not yield itself to this



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kind of evaluation, but it would be partly removed inasmuch as it appears in input.

4. Farm Income Problems

The high degree of variability of net income among Prairie farmers has been evident throughout the whole 1931-1960 period, though variations might have been somewhat milder during the last few years. The initial factor causing these variations appears to be farm output.

Another feature of Prairie farmers' income is that it has persistently lagged behind that of the rest of the population in Canada. While the latter has been continuously rising since 1939, the former has been on the decline since the high level of 1951 and 1952. Net farm income per farm decreased from \$4,500 in 1951 to \$3,600 in 1956 and finally to \$3,100 in 1960 (estimate). This trend seems to contradict the one forecast by the Royal Commission.¹¹

This growing inequality of income between the agricultural and non-agricultural sectors is the result of the prices of agricultural products lagging behind those of industrial products on one hand, and the persistence of the marginal farmer to work on his inefficient farm, on the other.

¹¹ W. M. Drummond and W. MacKenzie, "Progress and Prospects of Canadian Agriculture", Royal Commission on Canada's Economic Prospect, Ottawa, Queen's Printer, 1957, p. 342-347.

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One remark should be directed against over-simplification of a comparison of average farm and non-farm income which might obscure the real nature of the farm income level problem. The fact is that not all farm incomes are low all the time, but farm incomes in some areas of the Prairie Region are low all the time and all farm incomes are low part of the time.

SUMMARY AND CONCLUSIONS

At the beginning of this study an outline was presented of the demographic and social changes which took place in the Prairie Region during the last thirty years. The most important change observed was the redistribution of population as between the rural and urban groups. The rural group was decreasing at an average rate of one percent per annum. This off-farm movement affected mostly persons of 16 to 64 years of age. Children up to 15 years old and elderly people of 65 years and over actually showed an increase in numbers in rural population estimates. The main reason behind this movement was that urban centers offered better employment opportunities and cultural facilities. At the same time, the movement was strengthened by an improvement in transportation facilities and a better and more universal standard of education. A young farmer's son with considerably more years of schooling than his father had a good chance of getting employment in a nearby city where additional labour was often needed to satisfy the demand of its growing industry.

The impact of this outflow of rural population from the most productive working age group had a pronounced effect upon the whole economy. On the one hand, it strengthened the farmer's determination to substitute machinery for

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manual labour and on the other, it made available an additional pool of labour which enabled industrialization process of the whole country to proceed at an accelerated rate.

Alongside changes in the population structure the organization of the Prairie farm has also undergone considerable changes. First of all, there has been a great farm consolidation movement. Within the last thirty years or so the number of farms decreased by one fifth, while at the same time total farmland and cultivated land increased by 26 and 16 percent respectively. Thus, the average size of farm has increased by almost 50 percent - a substantial increase, considering the relatively short time period.

The consolidation of farms in the Prairie Region was a necessary prerequisite to farm mechanization. The nature and extent of the mechanical revolution which progressed at an accelerated rate during the second decade of the period (1941-1950) has been described in Chapter II. Machines not only replaced draught animals but both family and hired workers. While the average number of tractors and trucks per 1,000 acres of cultivated land increased within the last three decades by 200 and 500 percent, respectively, the agricultural labour force was almost halved. Apart from increasing the productivity per farmer, the mechanization of farming operations has also reduced the extent of the variability in grain yields by enabling seeding and harvesting to be done much faster than was possible with

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horse power. This, combined with improved farming methods and better pest and disease controls, resulted in increased food supplies. These, in turn, created a disposal problem, stemming from the relative inelasticity of demand for primary products in both home and export markets.

Another aspect of the changes in farm organization discussed in Chapter II was a trend towards more diversified farming, manifesting itself in a growing interest in "specialty" crops (such as flaxseed and rapeseed), and increased livestock production. This diversification was due in part to the effect of government agricultural price support policies, encouraging mixed farming, and also to a conscious effort by the farmer to insure against the losses which the failure of a single cash crop would involve.

Certain features of farm income were outlined in Chapter III. The analysis disclosed that compared to non-farm income it has been highly irregular. Incomes of those engaged in agriculture have tended to be lower than incomes earned in other occupations. In recent years (1956-1960), farm incomes have been falling while other incomes have been rising. The instability of farm income, however, is more pronounced in the first half of the period than in the second and this is a sign of some improvement.

Another development in the field of farm incomes which has been intensified in recent years is the existence

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of many farms with abnormally low incomes. It seems that the main factor limiting farm efficiency is land. Given the productive quality of the land, the area incorporated in the farm unit is too small, in the case of low-income farms, to effect a combination of factors which would provide a normal income. The inability of these subsistence farmers to rent, sell, or abandon their farms explains the persistence of the problem. Another factor responsible for meagre farm incomes is relatively inefficient management. Among numerous farm managers there will always be some with relatively little managing skill, who either refuse or are not able to acquire the necessary technical knowledge within the existing educational system.

It is apparent from this study that the major development which occurred in the Prairie Region within the last three decades was the great progress made in agricultural technology. An analytical description of this progress was given in Chapter II, but the question still remains, why was the rate of technological improvements so rapid as to be named by some writers a "technological revolution"? The answer lies in the fact that a well-developed technology may exist potentially in the form of research stations, scientific journals, technical schools, etc., but it is largely sociological considerations that either limit or sponsor the diffusion and practical application of technical knowledge.

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Rural society in the Prairies is characterized by a relatively weak social adhesion.¹² It does not offer such high resistance to change as old established societies (in Europe or Asia, for instance) would. The Prairie farmer, of widely differentiated cultural background, is not bound by loyalty to any group or set of values. He is, and has been more likely to rationalize in making decisions about particular innovations which could be advantageous to him. Some pockets of resistance in this society to the march of progress may be found, but they are bound to be rare.

A dispersed settlement pattern on the Prairies with each family isolated has put an emphasis on individualism. Another factor giving impetus to the adoption of labour saving devices has been a low man-to-land ratio. All these together formed a set of conditions extremely favourable to the diffusion and application of technical innovation.

¹² Rosen and Rosen, Technology and Society, Toronto, McGraw-Hill, 1941, p. 74.

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