

THE UNIVERSITY OF MANITOBA

SPATIAL CONSEQUENCES OF A
REGIONAL DEVELOPMENT PROGRAM:
SOME INSIGHTS FROM THE
INTERLAKE OF MANITOBA

by

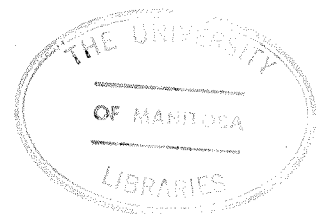
KYRIACOS HATZIPANAYIS

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE
STUDIES IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE MASTER OF ARTS

WINNIPEG, MANITOBA

NOVEMBER, 1979



SPATIAL CONSEQUENCES OF A
REGIONAL DEVELOPMENT PROGRAM:
SOME INSIGHTS FROM THE
INTERLAKE OF MANITOBA

BY

KYRIACOS HATZIPANAYIS

A thesis submitted to the Faculty of Graduate Studies of
the University of Manitoba in partial fulfillment of the requirements
of the degree of

MASTER OF ARTS

©1980

Permission has been granted to the LIBRARY OF THE UNIVER-
SITY OF MANITOBA to lend or sell copies of this thesis, to
the NATIONAL LIBRARY OF CANADA to microfilm this
thesis and to lend or sell copies of the film, and UNIVERSITY
MICROFILMS to publish an abstract of this thesis.

The author reserves other publication rights, and neither the
thesis nor extensive extracts from it may be printed or other-
wise reproduced without the author's written permission.

ABSTRACT

Appraisals of the spatial effectiveness of Canadian government rural development programs are too infrequently undertaken. Geography can be a useful component in this respect, because its concepts can be successfully employed to describe spatial variations in the rate of growth which result from such programs.

This study examines the spatial distribution of agricultural improvements precipitated by the Fund for Rural Economic Development (FRED) in the Interlake region of Manitoba. Consequently, a methodology is employed which considers both spatial variations in the rate of growth, and the factors responsible for existing trends in growth.

Findings from this study reveal that some degree of success has been attained through FRED's agricultural development programs. However, the magnitude of FRED's achievements did vary intra-regionally, and this was influenced by such factors as ethnicity and the processes of urbanization and suburbanization.

In this thesis, it is recommended that future research must be undertaken to determine the long-term benefits of FRED's agricultural programs in the Interlake. To this end, this study can serve as a comparative base for considering future happenings in the region's agricultural structure. Furthermore, it may become beneficial to those who feel the need for further geographically oriented government development planning.

ACKNOWLEDGEMENTS

The writer is extremely grateful to Dr. J. S. Brierley, thesis advisor, for his invaluable guidance and assistance throughout the preparation and writing of this thesis. A special expression of gratitude is tendered to Dr. D. Todd, for his assistance with the statistical analysis and useful comments.

Special thanks are extended to Dr. Carvalho, of the Department of City Planning, the external examiner.

The assistance of E. Pachanuk of the Geography Department's cartographic section, and K. Greschuk, the typist, is also acknowledged by the author.

In addition to those mentioned, the author is grateful to many others, who directly or indirectly, contributed to this study.

Special thanks are also due to my wife for her encouragement and enthusiasm.

TABLE OF CONTENTS

	<u>Page</u>
ABSTRACT.....	i
ACKNOWLEDGEMENTS.....	ii
TABLE OF CONTENTS.....	iii
LIST OF TABLES.....	v
LIST OF FIGURES.....	vii
INTRODUCTION.....	1
CHAPTER 1 A REGIONAL ANALYSIS OF THE INTERLAKE REGION.....	4
1.1 Introduction.....	4
1.2 The Region.....	4
1.3 Factors Contributing to Interlake's Stagnation.....	6
1.4 Summary.....	29
CHAPTER 2 GOVERNMENT INTERVENTION IN INTERLAKE'S PROBLEMS	30
2.1 Introduction.....	30
2.2 ARDA's Involvement in the Interlake.....	31
2.3 FRED-Interlake Agreement.....	32
2.4 FRED's Policies Pertaining to Agriculture.....	34
2.5 Implementation of FRED's Agricultural Programs in the Interlake.....	35
2.6 Expected Agricultural Advancements in Response to FRED.....	53
CHAPTER 3 CHANGES IN THE AGRICULTURAL AND RURAL SOCIO- ECONOMIC STRUCTURES OF THE INTERLAKE REGION, 1961 - 71.....	57
3.1 Introduction.....	57
3.2 Method of Analysis.....	58
3.3 Results of the Analysis.....	60
3.4 Summary.....	94
CHAPTER 4 THE SHIFT AND SHARE METHODOLOGY	99
4.1 Introduction.....	99
4.2 Description of the Technique.....	99
4.3 Application of the Shift and Share Technique.....	103
4.4 A Critique of the Shift and Share Technique.....	106
4.5 Research Design.....	110
4.6 Modification of the Conventional Shift and Share Methodology.....	112

	<u>Page</u>
CHAPTER 5 REGIONAL/STRUCTURAL ANALYSIS OF AGRICULTURAL CHANGES IN THE INTERLAKE, 1961 - 76.....	115
5.1 Introduction.....	115
5.2 Shift in Area of Improved Land.....	115
5.3 Shift in Livestock.....	122
5.4 Shift in Machinery.....	129
5.5 Shift in Farm Size.....	136
5.6 Shift in Farm Sales.....	144
5.7 Summary.....	151
CHAPTER 6 COMMENTARY AND CONCLUSION.....	154
APPENDICES	
A ARDA Research and Projects in the Interlake Prior to FRED-Interlake Agreement.....	160
B Justification of the Variables Employed in Principal Component Analysis.....	163
C Scores for Each of the Components Generated by the Principal Component Analyses, 1961 - 71.....	167
D Structural Composition of the Five Agricultural Components Used in Shift and Share Analysis.....	178
E Shifts for the Five Agricultural Components Employed in Shift and Share Analysis, 1961 - 76.....	180
F Changes in the Structural Composition of the Five Agricultural Components Employed in Shift and Share Analysis, 1961 - 76.....	196
BIBLIOGRAPHY.....	218

LIST OF TABLES

Table	<u>Page</u>
1.1	Employment by Industry Classification, 1961..... 7
1.2	Population by Age Groups, 1961..... 18
1.3	Components of Change in Population for the Interlake Region, 1956 - 61..... 19
1.4	Components of Change in Population for the Interlake Region, 1961 - 66..... 20
1.5	Population by Specified Ethnic Groups for Interlake's Subdivisions, 1971..... 25
1.6	School Attendance and Schooling, 1961..... 26
1.7	Wage Earnings in the Interlake, 1961..... 28
2.1	Performance of FRED's Land Acquisition Program, 1967 - 77..... 37
2.2	Performance of FRED's Land Clearing Program, 1967 - 73..... 42
2.3	Miles Reconstructed and Expenditures of FRED's Drainage Projects, 1967 - 74..... 45
2.4	Extension Activities: Regional Shift Distribution, 1972 - 73..... 48
2.5	Performance of the Farm Management Program, 1967 - 71 51
3.1	Relative Importance of Principal Components..... 61
3.2	Significant Variable Loadings on Each Component, 1961 62
3.3	Significant Variable Loadings on Each Component, 1971 63
5.1	Percentage Change in Area of Improved Land, 1961 - 76 116
5.2	Changes in the Structural Composition of Improved Land in the Interlake, 1961 - 76..... 122
5.3	Percentage Change in Livestock, 1961 - 76..... 123
5.4	Changes in the Structural Composition of Livestock in the Interlake, 1961 - 76..... 128

5.5	Percentage Change in Machinery, 1961 - 76.....	130
5.6	Changes in the Structural Composition of Machinery in the Interlake, 1961 - 76.....	135
5.7	Percentage Change in Farm Size, 1961 - 76.....	137
5.8	Structural Changes in the Various Farm-size Classes in the Interlake, 1961 - 76.....	140
5.9	Percentage Change in Farm Sales, 1961 - 76.....	144
5.10	Changes in the Structural Composition of Farm Sales in the Interlake, 1961 - 76.....	150
6.1	Performance of Interlake Subdivisions in Each Agricultural Component.....	156

LIST OF FIGURES

	<u>Page</u>
Figure	
1.1 The Interlake Region of Manitoba.....	5
1.2 Soil Zones in Southern Manitoba.....	9
1.3 Vegetation in the Interlake Region of Manitoba.....	12
1.4 Precipitation Patterns in Southern Manitoba.....	14
1.5 Temperature and Frost-Free Days in Southern Manitoba.....	15
2.1 Spatial Distribution of FRED's Land Acquisition Activities in the Interlake, 1967 - 77.....	39
2.2 Spatial Distribution of FRED's Drainage Projects in the Interlake, 1967 - 77.....	46
3.1 Flow Diagram Illustrating the Stages of the Component Analysis.....	58
3.2 Scores for Component No. 1 of 1961 Analysis (General- ized Component).....	66
3.3 Scores for Component No. 1 of 1971 Analysis (General- ized Component).....	69
3.4 Scores for Component No. 2 of 1961 Analysis (Slavic Farming Attributes).....	71
3.5 Scores for Component No. 2 of 1961 Analysis (British Farming Traits).....	73
3.6 Scores for Component No. 2 of 1971 Analysis (British Farming Traits).....	75
3.7 Scores for Component No. 3 of 1971 Analysis (British Socio-economic Dimension).....	76
3.8 Scores for Component No. 2 of 1971 Analysis (Slavic Farming Attributes).....	77
3.9 Scores for Component No. 3 of 1961 Analysis (Mixed Farming Emphasizing Livestock).....	79
3.10 Scores for Component No. 3 of 1971 Analysis (Mixed Farming Emphasizing Livestock).....	80

3.11	Scores for Component No. 4 of 1961 Analysis (Livestock Farming).....	82
3.12	Scores for Component No. 4 of 1971 Analysis (Livestock Farming).....	83
3.13	Scores for Component No. 5 of 1961 Analysis (Average Soil Class and French-German Ethnic Groups).....	86
3.14	Scores for Component No. 5 of 1971 Analysis (Average Soil Class and French-German Ethnic Groups).....	87
3.15	Scores for Component No. 6 of 1961 Analysis (Net-rural Outmigration).....	89
3.16	Scores for Component No. 7 of 1971 Analysis (Net-rural Outmigration).....	91
3.17	Scores for Component No. 7 of 1961 Analysis (Scandinavian-German Farming Attributes).....	93
3.18	Scores for Component No. 6 of 1971 Analysis (Scandinavian-German Farming Attributes).....	95
5.1	Total Shifts, Improved Land in Southern Manitoba, 1961 - 76.....	117
5.2	Structural Shifts, Improved Land in Southern Manitoba, 1961 - 76.....	119
5.3	Differential Shifts, Improved Land in Southern Manitoba, 1961 - 76.....	120
5.4	Total Shifts, Livestock Numbers in Southern Manitoba, 1961 - 76.....	124
5.5	Structural Shifts, Livestock Numbers in Southern Manitoba, 1961 - 76.....	126
5.6	Differential Shifts, Livestock Numbers in Southern Manitoba, 1961 - 76.....	127
5.7	Total Shifts, Farm Machinery Numbers in Southern Manitoba, 1961 - 76.....	131
5.8	Differential Shifts, Farm Machinery Numbers in Southern Manitoba, 1961 - 76.....	132
5.9	Structural Shifts, Farm Machinery Numbers in Southern Manitoba, 1961 - 76.....	134
5.10	Total Shifts, Farm-size Categories in Southern Manitoba, 1961 - 76.....	138

5.11	Structural Shifts, Farm-size Categories in Southern Manitoba, 1961 - 76.....	139
5.12	Differential Shifts, Farm-size Categories in Southern Manitoba, 1961 - 76.....	142
5.13	Total Shifts, Farm-sale Classes in Southern Manitoba, 1961 - 76.....	146
5.14	Structural Shifts, Farm-sale Classes in Southern Manitoba, 1961 - 76.....	147
5.15	Differential Shifts, Farm-sale Classes in Southern Manitoba, 1961 - 76.....	149

INTRODUCTION

The Interlake region of Manitoba, due to inherent problems in its rural and socio-economic structures, was designated by the federal government as an area appropriate for funding by the Fund for Rural Economic Development (FRED). FRED was active over a period of ten years (1967 - 77) and introduced special agricultural development programs, including land acquisition, clearing, and drainage, resource and farm management, together with veterinary and water services. The purpose of the scheme was to upgrade the agricultural conditions in the region, and consequently, improve the income of farmers.

Despite the implementation of a wide variety of agricultural development programs in the Interlake, the number of studies aimed at measuring their effectiveness has been limited. Norton, G.A. and MacMillan, J.A. (1970) evaluated the economic performance of FRED's drainage program by employing the technique of cost/benefit analysis. The two main concepts used in this study were economic efficiency and income redistribution. The former involved changes in private income brought about by FRED's expenditure, while the latter traced the redistribution of costs and benefits resulting from the increased economic activity. On the basis of a selected sample, the two authors determined that the cost/benefit ratio was in the order of 1:6, and that the largest proportion of the generated benefits was received by large farms.

Pareek (1972) used discounted cost/benefit ratios to determine the profitability of FRED's land-clearing program.

Here, the chosen sample was constituted from 90 out of the 600 farmers who cleared land during 1967 - 70. The analysis revealed that the cost/benefit ratio proved profitable only after the third year in operation.

Friesen (1974) also employed cost/benefit analysis to evaluate FRED's land acquisition program. Analyzing the responses of a random sample, he stated that the generated benefits were not of significant magnitude to justify the implementation of the program. He concluded, that the profitability of the program is dependent upon the benefits to be received from future utilization of the converted land.

The aforementioned studies, examined solely the impact of individual government agricultural development programs upon specific Interlake districts (before even the termination of the programs). To this date no research has been undertaken of the spatial distribution of agricultural advancements promoted by FRED in the 13 rural subdivisions comprising the region. Moreover, physical and socio-economic factors which inhibited agricultural development in the region have been overlooked. However, it is the author's contention, that such factors exert a considerable influence upon the intra-regional distribution of agricultural advancements promoted by FRED. Consequently, in this thesis, a methodology is employed which incorporates;

- a) spatial variations in the rate of growth, and
- b) the factors responsible for existing trends.

Once the physical and socio-economic structures of the region are examined in the first chapter, the goals

and implementation of FRED's agricultural development programs will be critically analyzed, and expected agricultural advancements will be stated in Chapter 2. Subsequently, Chapter 3 offers two static principal component analyses, referring to 1961 and 1971 respectively, which describe spatial attributes that have been prominent in the region's rural socio-economic and agricultural structures. The remaining sections (Chapters 4 - 5), constituting the cornerstone of the thesis, include an introduction to the methodological properties of the shift and share technique, as well as its modification and application into a description of spatial agricultural advancements promoted by FRED's programs. A final chapter summarizes the findings of this thesis and provides some concluding comments.

CHAPTER 1

A REGIONAL ANALYSIS OF THE INTERLAKE REGION, 1961

1.1 Introduction

The data from the 1961 Census of Canada revealed the Interlake to be one of the most lagging regions in the nation. Problems associated with its physical, as well as socio-economic structures have been held responsible for its underperformance. Consequently, the purpose of this chapter is to investigate and analyze the magnitude of these problems, so as to indicate their relative contribution to the overall stagnation of the region. Once the boundaries of the region are defined, its natural resource base will be analyzed in order to determine its agricultural potentiality. In addition, socio-economic factors, which impeded development within the region, are examined.

1.2 The Region

The Interlake region of Manitoba is bounded by Lake Winnipeg on the east, Lake Manitoba on the west, 52° 10'N latitude on the north, and the City of Winnipeg on the south. It encompasses an area of 10,350 square miles (28,806 square kilometers) (Gillies and Nickel, 1977, p. 28), and consists of ten municipalities, namely Bifrost, Coldwell, Eriksdale, Gimli, Rockwood, Rosser, St. Andrews, St. Laurent and Siglunes; together with three Local Government Districts, Armstrong, Fisher and Grahamdale (Figure 1.1).

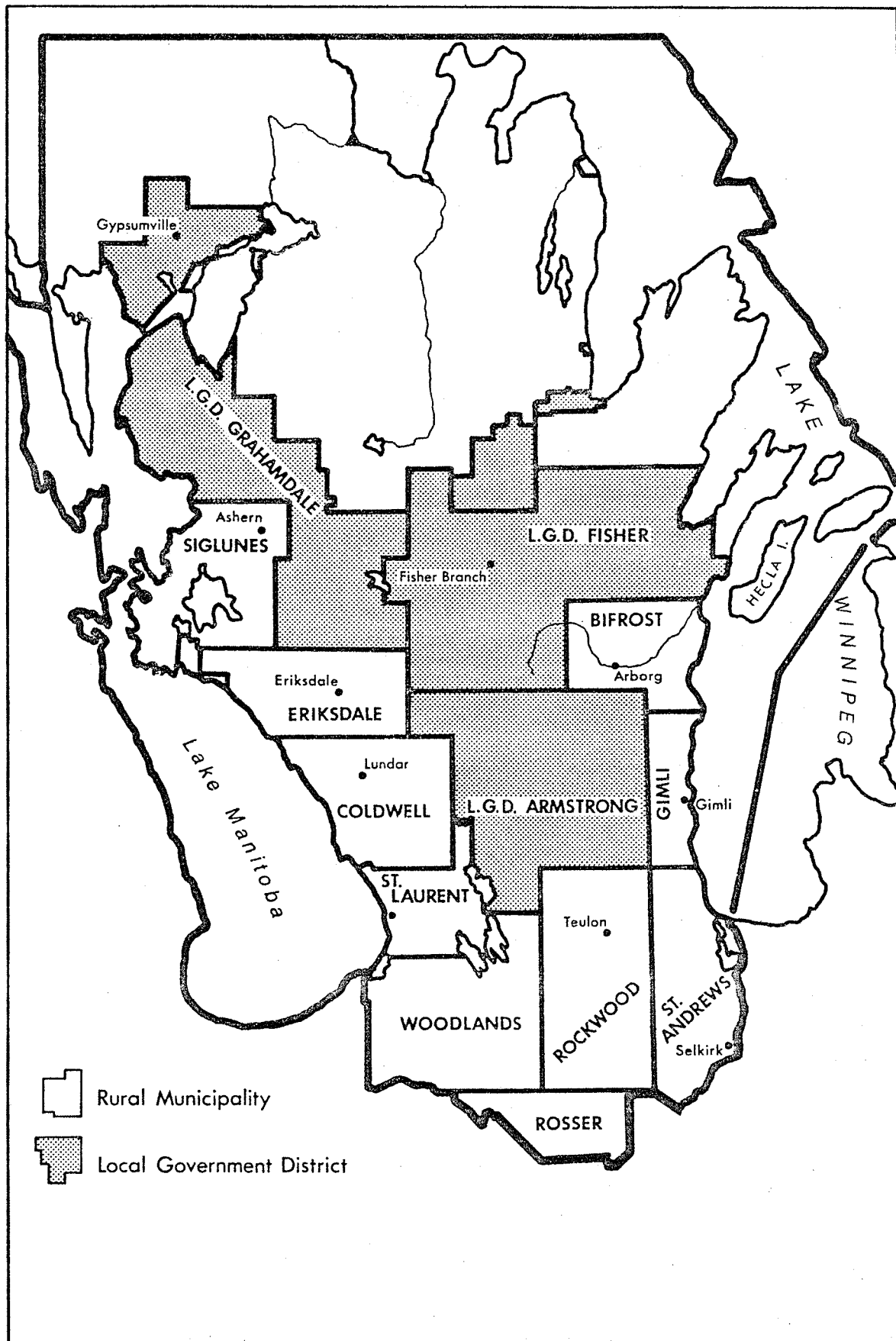


Figure 1.1, The Interlake Region of Manitoba

Source: Modified Framingham et al, 1970, p. XXIII.

The rural economy of the region is dominated by primary activities, specifically agriculture, and, to a lesser extent, fishing * (Table 1.1). Mining in the Interlake is insignificant, although limestone, gypsum and sand gravel are obtained in the region and consumed locally or in Winnipeg (Gillies and Nickel, 1977, p. 43).

Secondary sector activities in the region, like the remainder of southern Manitoba, ** are poorly developed, accounting for only 9.9 percent of the total labour force in 1961 (the corresponding figure for the province is 11.0 percent).

Tertiary or service activities in the Interlake, while being less significant than the provincial ones, are still a major component of the area's economic activity, comprising 29.35 percent of its total labour force in 1961. They are principally related to agriculture and situated in the southern half of the region.

1.3 Factors Contributing to Interlake's Stagnation

(1) Physical factors:

A number of physical factors affect the nature and

* However, commercial fishing in the Interlake has significantly declined through and after 1960's, owing to fluctuating markets and also to the extinction of certain species due to over-fishing (Marguardt, 1971).

** The terms southern Manitoba (or Province), in this thesis, refers to the 114 rural subdivisions comprising the southern part of Manitoba.

Table 1.1

Employment by Industry Classifications, 1961

	<u>Manitoba</u> *		<u>Interlake</u>	
	Number	Percent	Number	Percent
All Industries	133,744	100	11,762	100
Agriculture	57,623	43.08	6,762	57.49
Forestry	950	0.71	26	0.22
Fishing & Trapping	532	0.40	68	0.58
Mining	931	0.70	27	0.23
Sub Total Primary Activities	60,036	44.90	6,883	58.52
Manufacturing	7,558	5.65	612	5.20
Construction	7,106	5.31	558	4.74
Sub Total Secondary Activities	14,664	10.96	1,170	9.94
Transportation	11,300	8.50	617	5.24
Trade	14,891	11.13	836	7.10
Finance	1,841	1.37	64	0.50
Service	19,443	14.53	1,071	9.10
Public Administration and Defence	8,612	6.44	872	7.41
Sub Total Tertiary Activities	56,087	41.93	3,460	29.35
Unspecified	2,957	2.20	249	2.10

Source: Carvalho-Page Group, 1971, pp. 345 - 360.

* It excludes employment in metro Winnipeg.

economic viability of farming activities in the Interlake. These include the soil, as well as the minor physical elements of vegetation and drainage.

In this section, attention is focused on the nature of the problems associated with the physical environment, which invariably have contributed to the lacklustre performance of agriculture in this region.

(A) The soil:

In comparison to the other areas of southern Manitoba, the Interlake region possesses relatively poor soils. The dominant influence of limestone bedrock throughout the region adversely affects the soil structure and inherent fertility. Soils vary both in depth and composition, and largely reflect differential disposition of the glacial Lake Agassiz (Marguardt, 1971, p. 3). Four soil types characterize the region: degraded rendzina, rendzina, black-grey wooded, and black-fine textured soils (Figure 1.2). The degraded rendzina-rendzina soil types occupy the greater part of the Interlake (north, central and western districts), and consist primarily of thin clay deposits, mainly due to the limited presence of Lake Agassiz in the area (Marguardt, 1971, pp. 3 - 4). They are characterized by a gently sloping ridge-and-swale type of topography, as well as imperfect drainage, which ranges from poor in the swales to good on the top of the ridges (Barto and Vogel, 1978, p. 42). Rendzina soils were developed from high lime material (at least 40 percent of calcium carbonate content) (Weir, 1960, p. 12), which discourages extensive tree growth. Nevertheless, they do allow the growth

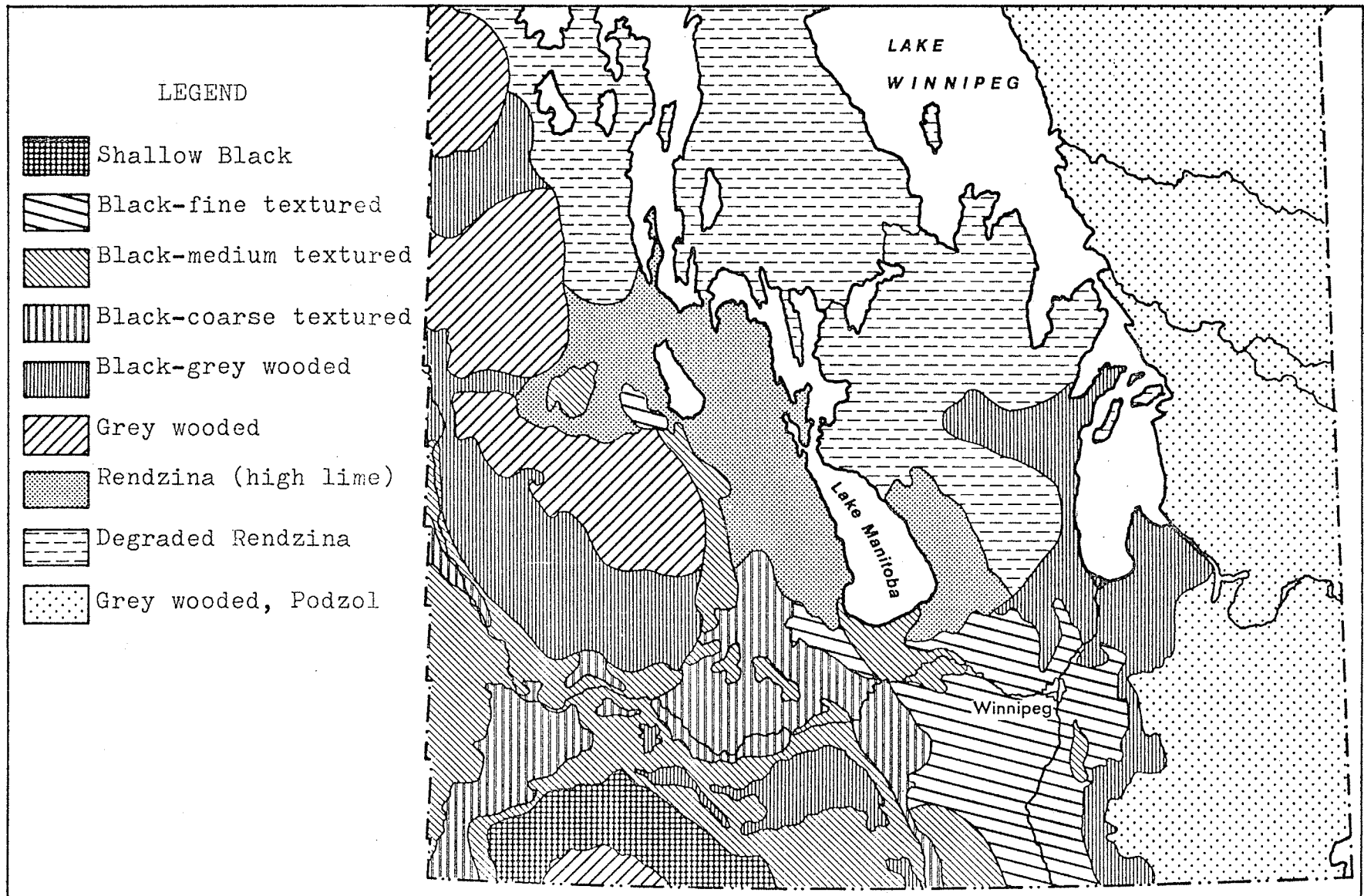


Figure 1.2, Soil Zones in Southern Manitoba

Source: Modified Weir, 1960.