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Rural economic diversification – A community and regional approach

Marjorie Page and Roland Beshiri, Statistics Canada

Highlights

- There is a wide range in the degree of economic diversification across regions and across communities within each region.
- Forty-one percent of all rural communities had a growing labour force and a diversifying economy between 1986 and 1996.
- Many rural communities dominated by agriculture and mining industries had a growing labour force and a diversifying economy between 1986 and 1996.

Abstract

Rural community economic diversification, or the spreading of the workforce across a variety of industrial sectors, is one solution to the problems facing rural regions and small towns. This makes communities less vulnerable to economic variability – particularly communities heavily dependent on the primary sector. Between 1986 and 1996, slightly less than half of rural communities were diversifying their economies and increasing their workforce. However, there are great differences found among the provinces and within regions. Communities within a region may be geographically close but may not share the same economic characteristics. This suggests that a community's regional context does not necessarily predict and does not constrain a community's economic possibilities.

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Contact the Agriculture Division at:

Agriculture Division, Statistics Canada
Ottawa, Ontario K1A 0T6

Toll free telephone number: 1-800-465-1991

Internet: agriculture@statcan.ca
Fax: (613) 951-3868

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Introduction

Economic diversification is one solution to the problems facing rural areas and small towns – particularly those heavily dependent on natural resource industries [Fletcher *et al.*, 1991; Clemenson, 1992]**.** Economic diversification is an increase in community employment through the introduction of a new industry or through the expansion of an existing industry other than a single sector or dominant industry. Economic specialization, conversely, is the expansion of a community's employment share in a dominant industry (Clemenson, 1992). However, some communities may not want to become more specialized as firms may be increasing production efficiency and earning satisfactory profits in a specific sector but the community may become more vulnerable to the fluctuations of supply and

demand in that specific sector. For example, a decrease in demand and/or a decline in the price of pulp and paper may result in lay offs or mill closures [Williamson *et al.*, 1999]. A diversified community economy would be expected to have a better chance to achieve future stability and growth.

Community economic diversification or specialization is determined in this bulletin with the Herfindahl Index of Concentration (HI) – a decline in the HI signifies less concentration in the dominant industry or greater diversification. An increase indicates more concentration in the dominant industry or greater specialization. See Box 1 for more details on the Herfindahl Index.

Care must be taken when interpreting the HI. While the HI indicates community or regional economic diversity or specialization, based on the distribution of employment across industrial sectors, it does not tell us whether the community's total labour force is increasing or decreasing. For example, the dominant sector in a rural community could be shedding labour due to an economic downturn. This would cause the HI to decrease, indicating "diversification". Yet, this type of diversification, with losses in the labour force, is not likely the desired outcome for community leaders who wish to diversify the community's economic base. A community would likely prefer to have increased economic diversity *and* employment gains.

On the other hand, the HI may show an increase, that is, the rural community is specializing its economic structure, but again, we do not know if the workforce is growing or declining. The workforce could be increasing (due to strong growth in the dominant sector) or decreasing (because other sectors are declining, leaving the major sector looking more dominant in a smaller community).

Box 1. Calculation of the Herfindahl Index of Concentration

The Herfindahl Index of Concentration (HI)

The Herfindahl Index equals the sum of the squared employment shares of each industrial sector in each community. The HI formula for a community with three industries is:

HI = (employment share of industry 1) ^{2} + (employment share of industry 2) ^{2} + (employment share of industry 3) ^{2}

HI = sum of the squared shares of all the industry sectors in the community

The sum varies from 0 (when a community has many industries, each with a small share of total employment – high diversity) to 1 (when one industrial sector accounts for all of the community's employment – complete specialization).

As an example, if a community has five industries where 20 percent are employed in the first industry, 5 percent in the second and 10 percent in the third, 40 percent in the fourth industry and 25 percent in the fifth industry, the index would look like this:

$$(.2)^2 + (.05)^2 + (.1)^2 + (.4)^2 + (.25)^2 = 0.28$$

Over a period of time, a change in the Herfindahl Index indicates whether the community is diversifying or specializing. The cities of Toronto and Ottawa are used here to exemplify this:
Toronto's HI was 0.16 in 1981 and increased to 0.19 in 1996 - Toronto became more specialized.
Ottawa's HI was 0.27 in 1981 and decreased to 0.24 in 1996 - Ottawa's economy became more diversified.

Experienced labour force

The experienced labour force includes those 15 years and older, excluding institutional residents, who were employed or unemployed during the week prior to Census Day and who last worked for pay or in self-employment during the Census year or in the previous year.

Data sources

The data for this bulletin were tabulated from Statistics Canada's Census of Population for 1981, 1986, 1991 and 1996 and adjusted to 1996 census boundaries.

Box 2. Geographic definitions

Census divisions (CDs)

A census division is an intermediate geographic area between the municipality (census subdivision) and the province level. Census divisions represent counties, regional districts and regional municipalities. In Newfoundland and Labrador, Manitoba, Saskatchewan and Alberta, provincial law does not provide for these administrative units. In these provinces, census divisions are delineated in co-operation with the provinces for the dissemination of statistical data (see Statistics Canada (1999) for the detailed definition).

Census consolidated sub-divisions (CCSs)

A CCS is a consolidation of two or more census subdivisions (i.e. incorporated towns or incorporated municipalities) – the typical case is where an incorporated town is surrounded by an incorporated municipality and they are 'consolidated' for statistical purposes (see Statistics Canada (1999) for the detailed definition).

From the 2,607 CCSs, using 1996 geographic boundaries, 2,145 CCSs were identified as rural. Rural CCSs are defined here as having a population of between 40 and 10,000 in 1981, and more than 40 people in each of the three subsequent census years.

It should be noted that since 34 percent of the rural CDs and 46 percent of the rural CCSs are located in Quebec, the analysis at the national level is weighted toward the situation in that province.

OECD definition of predominantly rural regions

Predominantly rural regions (CDs) are defined according to the Organization for Economic Co-operation and Development (OECD) definition. 'Predominantly rural' regions are CDs in which more than 50 percent of the population lives in a 'rural community' where a 'rural community' is defined as a CCS where the population density is less than 150 inhabitants per square kilometre. 'Intermediate regions' have between 15 and 50 percent of their population living in a rural community and 'predominantly urban' regions have less than 15 percent of the population living in a rural community. Statistics Canada further categorizes the predominantly rural regions into 'rural metro-adjacent regions', 'rural non-metro-adjacent regions', and 'rural northern regions.'

This bulletin documents the level and change in rural community diversification and specialization in Canada. We use data on the major job of workers in the community to calculate the degree of specialization/diversification in the community. We use census consolidated sub-divisions (CCSs) to represent communities (see Box 2 for the definition of CCSs).

On average, the level of diversification changed little over time

Over the period from 1981 to 1996 the level of specialization/diversification, as measured by HI, did not change much for the average predominantly rural region[1]. However, the range

[1] See figures 1,2 for census divisions (CDs) or regions and figures 13,14 for census consolidated subdivisions (CCSs) in

of the HI across regions and communities did appear to change with the business cycle. During the recession in the early 1990s, the range expanded as some regions became more specialized. In the upswing, underway by 1996, the range got smaller as some regions diversified and became more like the average region.

Rural non-metro-adjacent regions show the widest range in the level of diversification/specialization

In 1996, on average, the HI is the highest (most specialized) in rural northern regions (HI = 0.21) (Table 1). The other regions are more diversified with only a marginal difference between them.

A more interesting aspect is that rural regions show the widest range of HI among its component CDs. In particular, the most diversified CD (HI=0.09) is a rural non-metro-adjacent region (Table 1). Interestingly, the most specialized CD in Canada (HI = 0.36) is also a rural non-metro-adjacent region.

Page, Marjorie L. (2002) **Rural Diversification, 1981 - 1996.** (Ottawa: Statistics Canada, Agriculture and Rural Working Paper No. 60, Cat. No. 21-601-MIE2002060 (www.statcan.ca/cgi-bin/downpub/listpub.cgi?catno=21-601-MIE2002060

Table 1. The range of regional diversification is greater in predominantly rural regions than in other regions, 1996

	Predominantly urban regions	Intermediate regions	Predominantly rural regions		
			Rural metro-adjacent regions	Rural non-metro-adjacent regions	Rural northern regions
	Herfindahl Index of Concentration				
Most specialized CD	0.25	0.24	0.31	0.36	0.30
Average of CDs	0.18	0.17	0.16	0.17	0.21
Most diversified CD	0.15	0.11	0.10	0.09	0.15

Source: calculated by authors, Census of Population, 1996

Within each type of region, diversification varies widely across communities

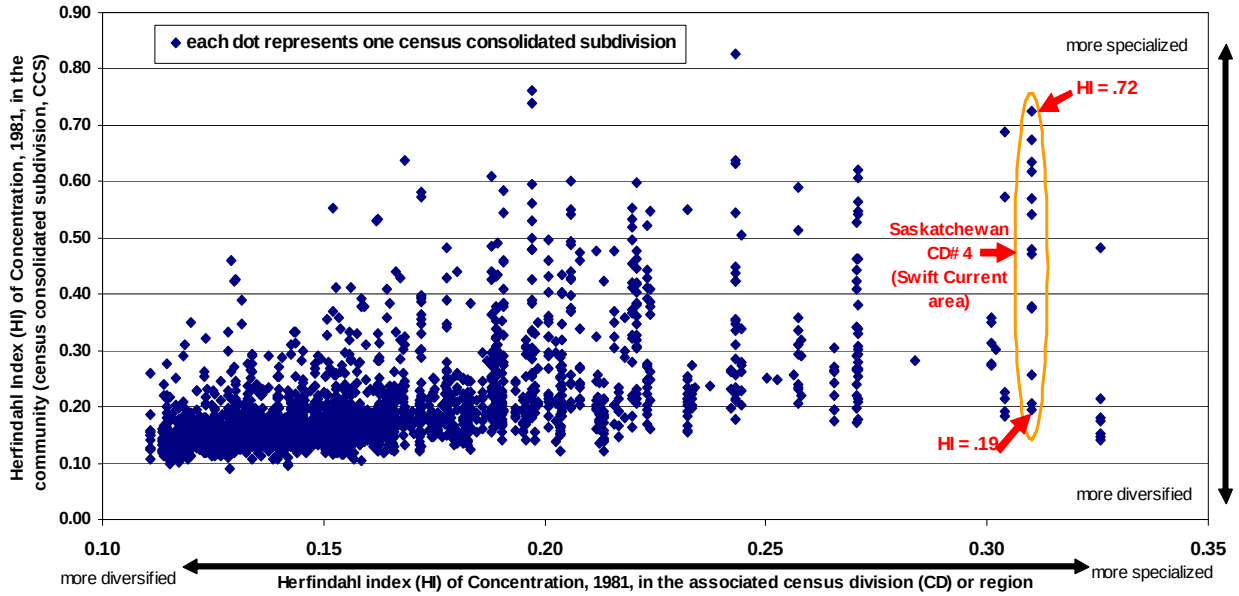
As in the case among CDs, noted above, there is also a wide range in the level of specialization and diversification across communities (CCSs). In fact, the range of the HI across all communities (CCSs) is far greater--from 0.09 to 0.83 (Figure 1).

For example, at the far right of Figure 1, we identified Saskatchewan CD # 4 (found in south-west Saskatchewan, the Swift Current area) with an HI of 0.31, in 1981 (reading along the horizontal axis). For this CD, we see the vertical scatter of 13 communities or CCSs according to the level of the HI of the CCS (reading along the vertical axis). Within this (more specialized) region or CD, there is a more diversified community (HI = 0.19) as well as a more specialized community (HI = 0.72). In general, regardless of where a CD is located along the horizontal axis (i.e. regardless of the level of specialization/diversification of the CD), there is a wide range of community HIs – i.e. there is a wide range in the levels of specialization/diversification of communities within the CD.

The large cluster in the lower left of Figure 1 indicates that generally the more diversified a CD is, the more diversified are the CCSs within the CD. Also, in these more diversified CDs there is less of a diversification/specialization range among the CCSs.

Given the policy discussion around the desire of communities and regions to diversify their economies, it is instructive to look at the scatter of diversified and specialized communities within regions at each level of diversification. There are specialized communities and diversified communities within diversified regions. Similarly, there are specialized communities and diversified communities within specialized regions. Policy analysts focusing on an economic development strategy for a particular community may wish to consider the regional level of diversification. Perhaps it is important to maintain some specialization in particular communities to ensure regional diversity of the broader CD.

Figure 1 – Whatever the level of diversification of each region (CD), there is a wide range of diversification/specialization of communities (CCSs) within the region, 1981

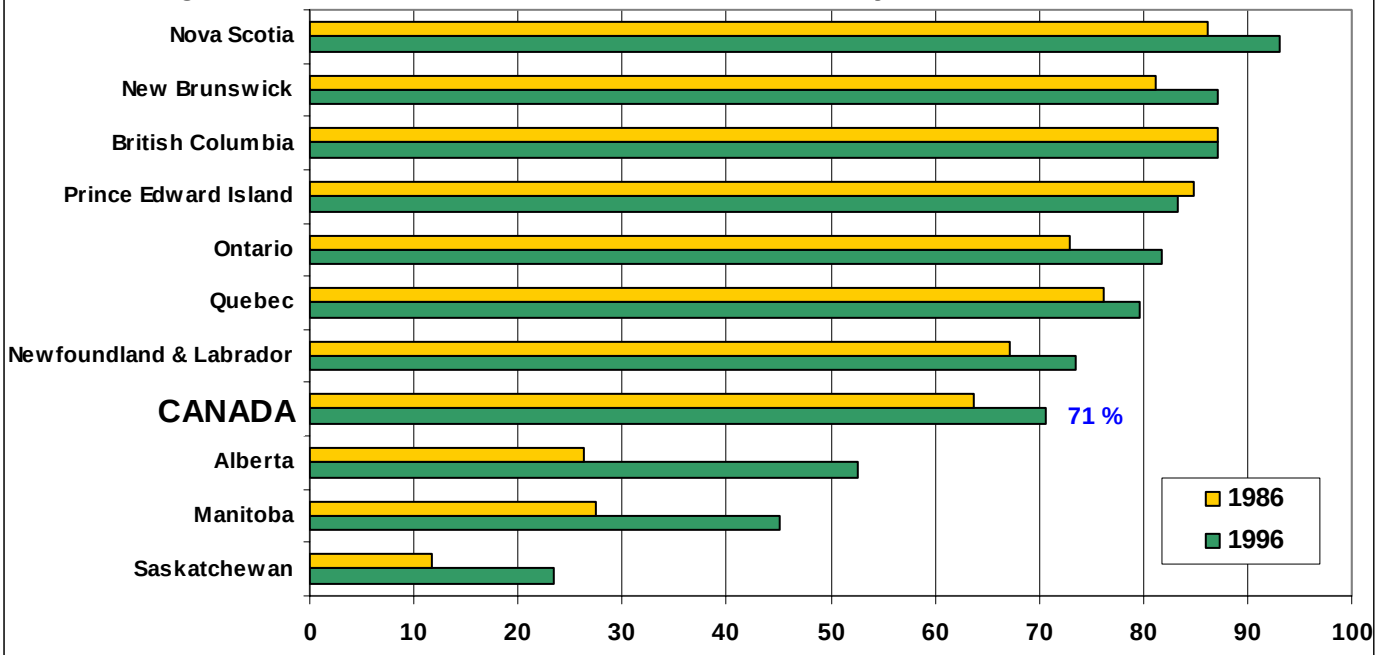


Source: Statistics Canada. Census of Population, 1981.

In 1996, over 70 percent of rural communities were "diversified"

When using the Herfindahl Index there is no established standard or limit that defines a community to be diversified or specialized. In 1996, 71 percent of rural CCSs were diversified to the extent that their HI was less than 0.2 (Figure 2). This was an increase from 64 percent in 1986.

Figure 2 - Prairie rural communities are less likely to be diversified, 1996



Note: The Yukon has been excluded since its one CCS has a population over 10,000, thus not meeting the criteria of this paper. The Northwest Territories and Nunuvat were excluded since none of the four CCSs had an Herfindahl Index of less than 0.2.

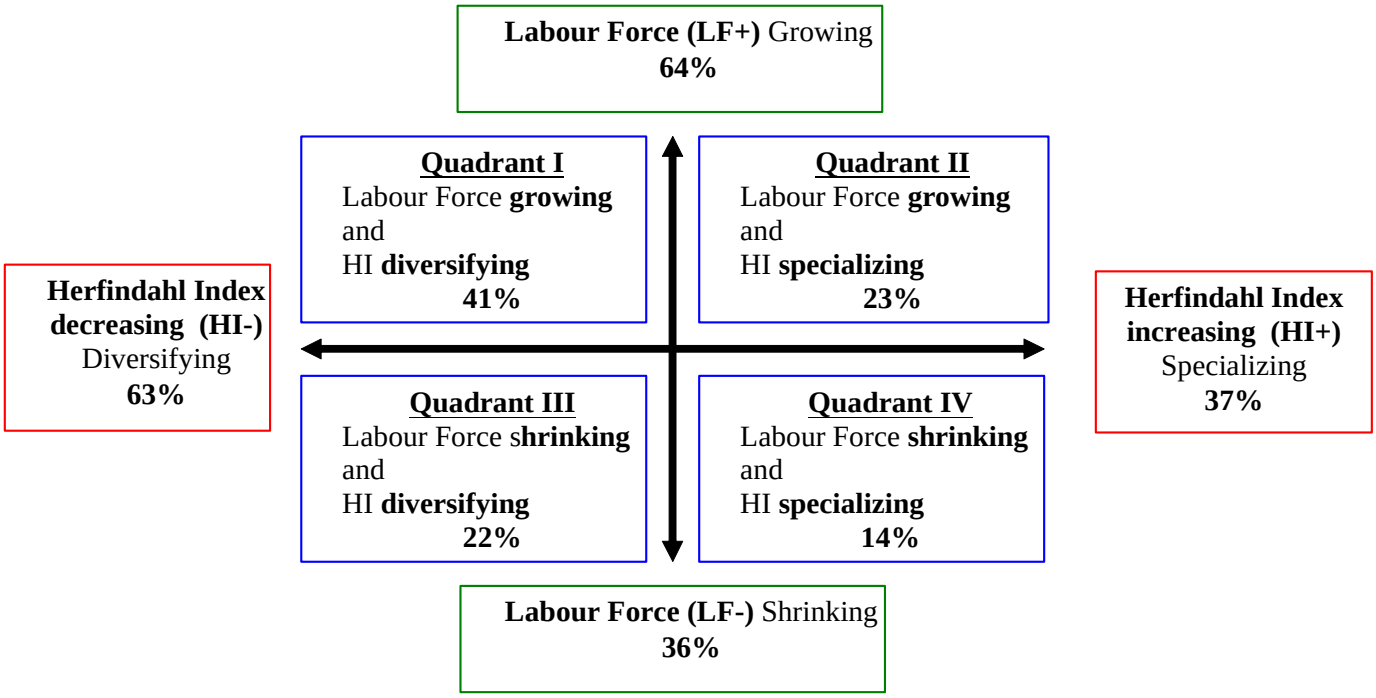
Source: calculatd by authors, Statistics Canada, Census of Population, 1986, 1996

The Maritime Provinces and British Columbia had the largest proportion of diversified rural CCSs. The Prairie Provinces had the smallest share of diversified rural CCSs. But, more optimistically, they also had the greatest gains over the 1986 to 1996 period in terms of the share of rural CCSs that were diversified.

Earlier, it was noted that while economic diversification or specialization is occurring in many communities, this may not be a desirable outcome if the workforce is declining. To better understand these dynamics for rural communities, the change in both the Herfindahl Index and the community workforce was determined between 1986 and 1996. The result is seen in the quadrants in Figure 3. This figure shows:

- Quadrant I – rural communities with a growing workforce and a more diversified economy
- Quadrant II – rural communities with a growing workforce and a more specialized economy
- Quadrant III – rural communities with a shrinking workforce and a more diversified economy
- Quadrant IV – rural communities with a shrinking workforce and a more specialized economy.

Figure 3 - Changes in experienced labour force and Herfindahl Index of rural census consolidated subdivisions (CCS), Canada, 1986 to 1996



Most communities would likely prefer the situation found in Quadrant I, where the community is becoming more stable and robust due to economic diversification and the workforce is increasing due to expanding product demand and exports from the community. While 64 percent of the rural communities (rural CCSs) found themselves with an increased workforce, 41 percent were in the more enviable position of also having a diversifying economy (Figure 3 and Appendix 1). This represented 882 of the 2,145 rural CCSs.

Across Canada, the provinces or territories with the highest share of these growing and diversifying rural communities were the Northwest Territories and Nunavut, Ontario and Alberta (Appendix 1 and Map 1). Quadrant II communities were also prevalent in these provinces and Territories, plus in the Maritime Provinces, Quebec, and particularly in British Columbia. Quadrant II communities were increasing their workforce with the help of a more specialized economy. This is good news for the short term, but this may create community instability in the long term.

Many rural communities in Newfoundland and Labrador, Manitoba and Saskatchewan were in Quadrant III – these communities experienced a shrinking workforce and a "diversifying" economy (i.e. the HI declined). Here, the measured economic diversification may have resulted from the loss of a main industry and thus

the share of the remaining workforce was scattered more evenly among the remaining community industries. Newfoundland and Labrador, Saskatchewan as well as Nova Scotia reported high shares in, arguably, the least desirable Quadrant IV. In these rural communities, an increase in economic specialization occurred along with a loss of the labour force.

How did rural communities dominated by primary industries perform?

A review of communities dominated by primary industries[2,3] shows that for communities dominated by agriculture, mining, and forestry and logging, a significant share of rural communities had a growing workforce and increased economic diversification, between 1986 and 1996. Agriculture and mining dominated communities had 52 percent and 41 percent, respectively, of their communities with workforce growth and increased economic diversification. Logging and forestry dominated communities failed to have most of their communities' workforce growing and diversifying (only 26% were in Quadrant I)[4].

Summary

Diversification increased among Canada's rural communities in the 1986 to 1996 period. In fact, 41 percent of the rural communities experienced a growing workforce and a diversifying economy over this period. However, there are great differences found among the provinces and within regions. Communities within a census division may be geographically close but may not share the same economic characteristics. This suggests two ideas. First, the regional context of a community does not necessarily become a predictor of how poorly or well a community's economy will do. Other important elements that will differentiate one community's outcomes from another may be behind a community's development, e.g., leadership skills, community cohesion, etc. A second idea is that there is a need to compare rural communities to themselves and to reduce the emphasis on rural – urban contrasts. In other words, perhaps there should be a greater focus toward equalizing the socio-economic differences among rural communities and assisting those that are doing poorly on a regional scale.

[2] A rural community is defined here as being dominated by an industry when 20 percent or more of the experienced labour force is attached to a particular industry. Industry dominance was measured for 1981. For those CCSs that were dominated by a primary industry in 1981, the changes in the experienced labour force and the Herfindahl Index were measured between 1986 and 1996.

[3] The fishing industry was not included with the primary industries due to a small sampling of applicable communities.

[4] See Tables 9-17 in Page, Marjorie L. (2002) **Rural Diversification, 1981 - 1996.** (Ottawa: Statistics Canada, Agriculture and Rural Working Paper No. 60, Cat. No. 21-601-MIE2002060 (www.statcan.ca/cgi-bin/downpub/listpub.cgi?catno=21-601-MIE2002060).

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Marjorie Page is an analyst in the Input-Output Division, Statistics Canada and Roland Beshiri is an analyst in the Research and Rural Data Section, Agriculture Division, Statistics Canada.

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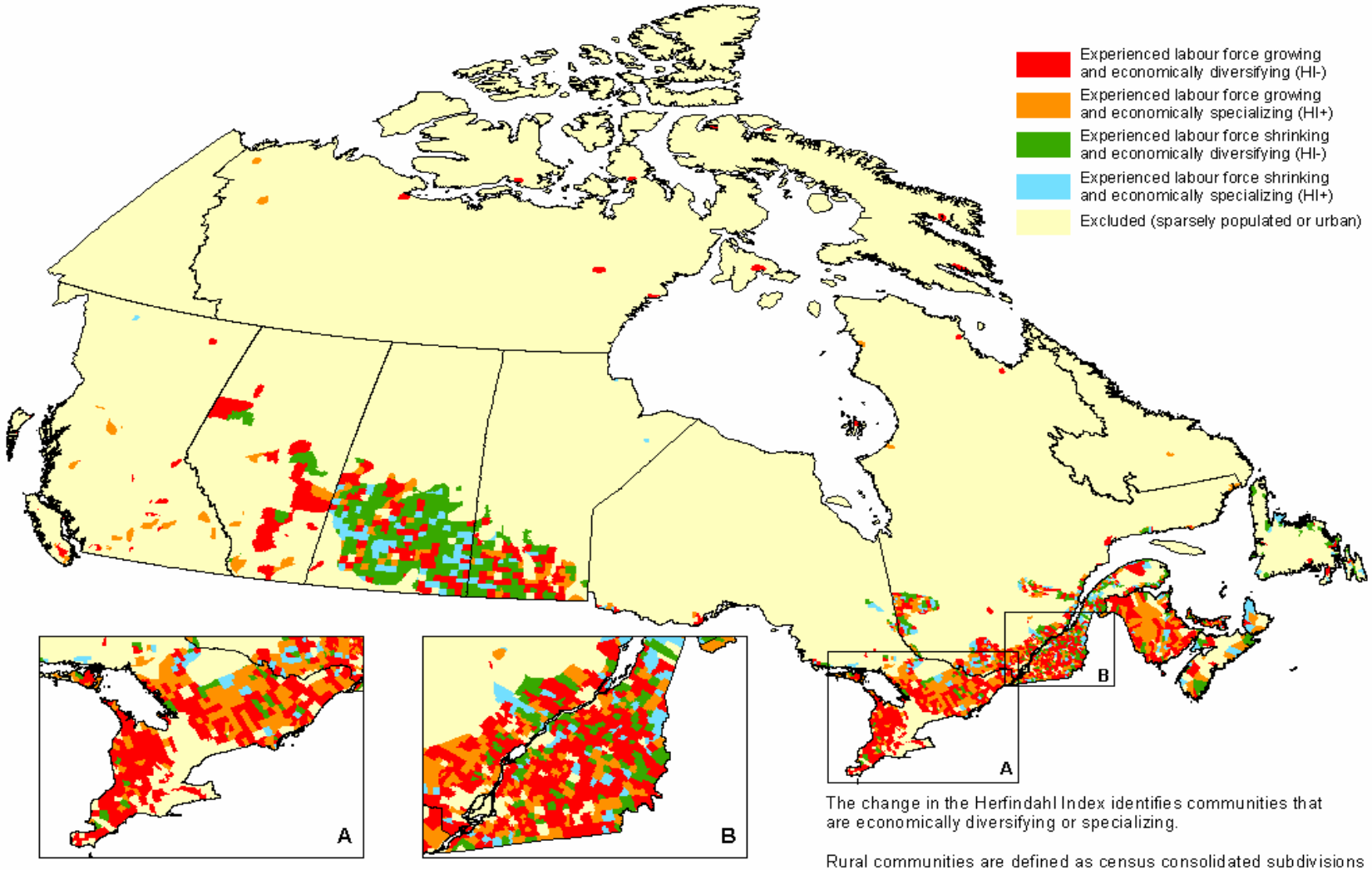
Map 1 The change in the labour force and Herfindahl Index (HI) in rural communities, Canada, between 1986 and 1996



The change in the Herfindahl Index identifies communities that are economically diversifying or specializing.

Rural communities are defined as census consolidated subdivisions with populations between 40 and 10,000.

Source: Statistics Canada Census 1986, 1991, and 1996
Map produced by Spatial Analysis and Geomatics Applications (SAGA), Agriculture Division, Statistics Canada, 2003

Appendix 1 – Change in the Herfindahl Index and change in experienced labour force for rural communities (CCSs), Canada, between 1986 and 1996

Quadrant	I	II	III	IV	Total
Change in experienced labour force	LF+	LF+	LF-	LF-	
Change in Herfindahl Index	Diversify	Specialize	Diversify	Specialize	
	Number of CCSs by quadrant				
Newfoundland & Labrador	11	6	36	26	79
Prince Edward Island	31	18	9	8	66
Nova Scotia	6	10	5	8	29
New Brunswick	61	51	12	9	133
Quebec	417	230	179	151	977
Ontario	217	110	32	25	384
Manitoba	40	17	47	9	113
Saskatchewan	62	27	141	61	291
Alberta	21	9	8	0.0	38
British Columbia	13	17	0.0	1	31
Northwest Territories and Nunavut	3	1	0.0	0.0	4
CANADA	882	496	469	298	2,145
	Percent of rural CCSs by quadrant in Canada				
Newfoundland & Labrador	1.2	1.2	7.7	8.7	3.7
Prince Edward Island	3.5	3.6	1.9	2.7	3.1
Nova Scotia	0.7	2.0	1.1	2.7	1.4
New Brunswick	6.9	10.3	2.6	3.0	6.2
Quebec	47.3	46.4	38.2	50.7	45.5
Ontario	24.6	22.2	6.8	8.4	17.9
Manitoba	4.5	3.4	10.0	3.0	5.3
Saskatchewan	7.0	5.4	30.1	20.5	13.6
Alberta	2.4	1.8	1.7	0.0	1.8
British Columbia	1.5	3.4	0.0	0.3	1.4
Northwest Territories and Nunavut	0.3	0.2	0.0	0.0	0.2
CANADA	100.0	100.0	100.0	100.0	100.0
	Percent of rural CCSs in each province				
Newfoundland & Labrador	13.9	7.6	45.6	32.9	100.0
Prince Edward Island	47.0	27.3	13.6	12.1	100.0
Nova Scotia	20.7	34.5	17.2	27.6	100.0
New Brunswick	45.9	38.3	9.0	6.8	100.0
Quebec	42.7	23.5	18.3	15.5	100.0
Ontario	56.5	28.6	8.3	6.5	100.0
Manitoba	35.4	15.0	41.6	8.0	100.0
Saskatchewan	21.3	9.3	48.5	21.0	100.0
Alberta	55.3	23.7	21.1	0.0	100.0
British Columbia	41.9	54.8	0.0	3.2	100.0
Northwest Territories and Nunavut	75.0	25.0	0.0	0.0	100.0
CANADA	41.1	23.1	21.9	13.9	100.0

Note: The Yukon has been excluded since its one CCS has a population over 10,000, thus not meeting the criteria of this paper.
Source: Statistics Canada. Census of Population, 1986 and 1996.

How to use this table

The **percent of rural CCSs by quadrant in Canada** is the percent distribution of CCSs across all the provinces for CCSs classified to each quadrant. For example, for all CCSs classified to Q1, 47 percent are in Quebec.

The **percent of rural CCSs in each province** is the percent distribution of CCSs across all the quadrants types for each province. For example among all of Ontario's rural CCSs, 56 percent are in Q1.

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