



The Canadian Rural Revitalization Foundation



*Seven Reports
on the Identification of Rural Indicators
for Rural Communities*

7. Resource Reliance

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Introduction

Resource reliance refers to the relationship between social and natural resource systems. It reflects the extent to which the social system is reliant on one or more natural resources. Resource reliance can be defined as the proportion of activity in the resource sector activities that contribute to an area's total basic economic activity (Korber et al., 1998). Resource sector activities include agriculture, forestry, logging, mining and oil and gas related industries.

Research indicates that reliance on natural resources tends to contribute to the economic well-being of a region (Stedman et al., 2004). Economic well-being indicators include poverty, unemployment and income. However, many studies have found that the type of resource industry has a profound impact on the degree of well-being produced. For instance, Overdest and Green found that pulp and paper mills provide higher per capita incomes whereas other industries such as logging and sawmills were not associated with any trend in higher per capita incomes (Parkins et al., 1995).

Further, the effects of resource dependency on economic as well as social well-being were shown “much variation even within a single industry” (Stedman et al., 2004). Among numerous other factors, geography may also play a substantial role. For instance, the logging industry may have very different implications for communities in British Columbia than communities in New Brunswick.

Several early studies have even found that natural resource-reliant communities have suffered many negative outcomes as a result of their high concentration of natural resource activities. However, the type of industry seems to also play a significant role since these differences varied across each resource industry. For example, some researchers have found that forest sector reliant communities have higher rates of unemployment, poverty, divorce and even higher crime rates. While on the other hand, mining communities were found to have few differences in terms of these social and economic indicators (Stedman et al., 2004).

The impact, of natural resource reliance on communities is well documented and its effects are wide-ranging, whether positive or negative. In fact, many “resource-based communities today are full-fledged communities in their own right, with extensive local health and educational services along with local retail and business services” (Parkins et al., 2003). Communities will often identify themselves by their concentration in a natural resource and even build their entire community around this resource involvement.

In any case, identifying which communities tend to be more reliant on natural resources than other communities is a very important objective. It will serve to identify which communities have a higher concentration of resource reliance than others. As a result, measures can be adopted to protect and enrich natural

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resources in these areas or increase the economic diversity of the communities in order to maintain and improve sustainability.

Definitions of Resource Reliance

Resource reliance indexes measure the importance of natural resources to the social and economic well-being of a region. Several different approaches have been utilized to measure resource reliance. The majority of studies have focussed on three specific employment, production and income-based measures:

1. Total Employment Income

This measure has been utilized to determine resource reliance in several studies. In this index, reliance is calculated using employment income from resource-based industries as the total proportion of employment income in a region. In this case, employment income for an industry is measured as: the number of people employed in the industry, multiplied by the average income for the industry (Leake, 2002).

2. Industry Employment

This is the most common approach to measure resource reliance. In this index, reliance is calculated using industry employment in resource-based industries as the total proportion of industry employment in a region. Essentially, the number of people employed in resource-reliant industries is divided by the total labour force of a region.

3. Production

This approach has been used by Natural Resources Canada and defines resource reliance in terms of a region's economic base. The degree of resource reliance of each region is determined by the percentage of commodities produced by a selection of resource industries as compared to all commodities produced by the region. In this case, regions that were found to be at least 50% reliant on a particular natural resource were labelled as resource-reliant communities.

Indicator Development

We have opted to measure resource reliance in terms of industry employment since it provides the most direct and easily accessible approach. For this analysis, we will rely on Statistics Canada census data and use the three-digit Standard Industrial classifications (SIC)¹ for natural resources for 1996 and the

¹ The 1996 industry data were produced according to the 1980 Standard Industrial Classification System (SIC). This classification consists of a systematic and comprehensive arrangement of industries structured into 18 divisions, 75 major groups and 296 groups. These industrial groups are based on the general nature of the establishment's business, industry or service (Statistics Canada, 2004).

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North American Industrial Classifications System (NAICS)² codes for 2001 have been used.

Although these classification systems are very similar in nature, we must caution against direct comparisons between these two census years. The natural resource industry categories include:

Natural Resource Industries for 1996 and 2001

1996	2001
Agricultural	Agricultural, Forestry, Fishing, Hunting
Fishing and Trapping	Mining, Oil and Gas Extraction
Logging and Forestry	
Mining, Quarrying, Oil and Gas	

In order to create an index to measure resource reliance, we have taken the total number of persons employed in the industries listed above and then divided this number by the total labour force for each census sub-division (CSD)³ in Canada. Results from the index are represented as percentages and can range from 0% to 100% with 0% meaning absolutely no resource reliance is present in a CSD (no people are employed in the resource industries listed above) to 100% meaning completely resource reliant CSD (all people are employed in those industries).

Evaluation of the Indicator

The following table indicates the average amount of resource reliance for all CSDs in Canada:

Table 1:

Resource Reliance: Average Characteristics of CSDs in Canada

	N	Minimum	Maximum	Mean	Std. Dev.
1996	4058	0	97.14	17.86	17.29
2001	4014	0	92.19	16.49	16.46

² The 2001 industry data were produced according to the 1997 North American Industrial Classification System (NAICS). The NAICS provides enhanced industry comparability among the three North American Free Trade Agreement (NAFTA) trading partners (Canada, United States and Mexico). This classification consists of a systematic and comprehensive arrangement of industries structured into 20 sectors, 99 sub-sectors and 300 industry groups. The variable 'Industry' (based on the 1997 NAICS) does not permit direct comparison to any previous census industry data (Statistics Canada, 2004).

³ A census subdivision (CSD) is the general term for municipalities (as determined by provincial legislation) or an area treated as municipal equivalents for statistical purposes (Statistics Canada, 2004). Geographic boundaries are based on 2001 Statistics Canada census definitions. CSDs with populations of less than 250 people have been excluded from this analysis since the values become unreliable due to confidentiality transformations.

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The resource reliance index has been applied to 4058 CSDs in Canada in 1996 and 4014 CSDs in 2001. Based on the table above, we see that on average, CSDs in Canada had 17.9% of their workforce employed in resource-reliant industries. In 2001, this percentage dropped slightly to 16.5% indicating a slight decrease in resource reliance in Canada over the 5-year period.

Table 2 presents the resource reliance index breakdown by the 10 Canadian provinces and 3 territories for 1996 and 2001:

Table 2:

Average Resource Reliance per CSD by Province

Province	1996	2001
Newfoundland	15.41	15.72
PEI	21.74	20.92
Nova Scotia	10.67	10.85
New Brunswick	12.42	11.71
Quebec	13.70	12.73
Ontario	9.00	7.94
Manitoba	22.80	20.38
Saskatchewan	37.17	35.01
Alberta	20.29	18.22
BC	14.68	12.64
Yukon	12.94	7.42
Northwest	10.26	10.51
Nunavut	9.74	2.91
Total	17.86	16.49

From the results in table 2, we see that CSDs in the province of Saskatchewan had the highest degree of resource reliance. On average, more than one-third (35%) of their employment is reliant on natural resources in 2001 down slightly from 37.2% in 1996. This finding is most likely due to Saskatchewan's heavy reliance on agricultural based activities.

Ontario CSDs had the lowest rate of resource reliance among the 10 Canadian provinces with an average of slightly less than 8% in 2001 and 9% in 1996 of their employment reliant on resources. The majority of the workforce in the province of Ontario is made up of secondary and tertiary industry workers and relies relatively little on primary industries such as agriculture, fishing and logging.

Nunavut territory actually had the lowest rate of resource reliance in Canada in 2001 with less than 3% of their workforce reliant on natural resources. This is most likely due to Nunavut's geographic location in the north of Canada and their cold climate which both make it difficult for natural vegetation to flourish. At the same time, mining operations tend to employ relatively few workers.

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The following table presents a breakdown of resource reliance by urban-rural type⁴ of CSD:

Table 3:

Resource Reliance by Urban-Rural Status

Urban/Rural Type of CSD	1996	2001
Urban Core	3.18	3.09
Urban Fringe	5.85	5.75
Rural Fringe, in CMA/CA	11.27	10.10
Urban, outside CMA/CA	10.41	9.54
Rural, outside CMA/CA	23.06	21.07
Total	18.28	16.56

From table 3, we see that rural CSDs, outside CMA/CA, represent the highest average of resource-reliant activities with 21% of the rural workforce reliant on natural resources in 2001. This figure has actually decreased by more than 2% over the 5-year period. Not surprisingly, urban core CSDs had the lowest percentage of resource reliance with an average of slightly more than 3% of employment in urban core CSDs reliant on natural resources in both 1996 and 2001. This concentration of resource reliance in rural areas is due to the fact that these areas tend to have greater access to natural resources than do urban areas. Urban areas are more concentrated in secondary and tertiary industries such as business, administrative and manufacturing.

Future Research

In future, research in the area of resource reliance should focus on more indicators than simple employment and income breakdowns. One may want to examine some environmental indicators that measure the actual amount of natural resources that are being extracted from the area. For example, the percentage of available forest in square kilometres or hectares used for logging or pulp each year. Resource reliance can also be broken down into three main categories: agriculture, fishing and logging and examined at each of these three levels independently. All three of these resources are very unique and have very different implications for both the environment and the population.

⁴ These breakdowns include urban core, urban fringe and rural fringe and distinguish between central and peripheral urban and rural areas within or outside of a census metropolitan area (CMA) or census agglomeration (CA) (Statistics Canada, 2004).

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