



TRADE AND AGRICULTURE DIRECTORATE

**THE ROLE OF AGRICULTURE AND
FARM HOUSEHOLD DIVERSIFICATION**

IN THE RURAL ECONOMY OF

CANADA

Foreword

This report reviews information on the role of agriculture and farm household diversification in the rural economy of Canada. It was prepared by consultants, Julio Mendoza and Thomas G. Johnson. Julio Mendoza is a Research Associate at the University of Missouri and Thomas Johnson is Frank Miller Professor of Agricultural Economics and Professor of Public Affairs, University of Missouri, Columbia. Professor Johnson is also the Rural Policy Research Institute's Director of Analytic and Academic Programs.

It is one of 13 country reviews prepared under Output area 3.2.1: Agricultural policy reform (Item 3.2) of the programme of work and budget of the Committee for Agriculture for 2007-08.

Based on material compiled from the available literature, these country reviews address all or most of the topics listed below:

- Definitions and underlying concepts of "rural" as they exist at the national level.
- The availability of data pertaining to the share of agriculture and the agro-food sector in the economies of OECD countries at the national level and in rural areas and trends therein.
- The availability of data relating to the income situation of farm households and in particular the availability of information related to non-farming activities.
- The extent to which non-farming income-earning activities of farm households are farm based (*i.e.* using farm resources as in the case of farm tourism) or rural based (located in rural areas).
- The extent to which the industries upstream and downstream from primary agriculture are located in rural areas.
- The strength of multiplier effects between farm/farm based and up/downstream industries and rural economies.

The information in these country reviews was used as background to the report "The role of agriculture and farm household diversification in the rural economy: evidence and initial policy implications" [TAD/CA/APM/WP(2009)1/FINAL], which was declassified by the Working Party on Agricultural Policies and Markets in February 2009.

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THE ROLE OF AGRICULTURE AND FARM HOUSEHOLD DIVERSIFICATION IN THE RURAL ECONOMY OF CANADA

Although the role of agriculture and in some cases the larger agro-food sector in accounts for a declining portion of the economies of developed nations, it still plays an important role in many regions. More important perhaps, it plays an evolving role in these regions, frequently affecting other sectors directly and indirectly. This document explores these myriad economic roles of the agricultural and agro-food sectors in Canada.

The Canadian agricultural sector has been at the forefront of the trend toward increasing productivity and declining employment and value of production in farming. Concomitant with this trend has been one of increasing value added in the agro-food sector as the traditional agricultural commodities were transformed into more convenient and higher-valued consumer products. More recently, the range of products manufactured from agricultural products has increased beyond food and fibre to include a variety of bio-based products including biofuels. Furthermore, the uses of agricultural assets have broadened to include agro-tourism and the production of environmental services (sometimes referred to as multifunctionality). Included in this latter category are such things as watershed protection, wildlife habitat provision, carbon sequestration, wind power generation and many other activities.

This report is a broad-brush examination of these issues in Canada. We set out to address eight questions and issues.

Definition of rural areas in national statistics

Questions addressed in this section include: How are rural areas defined in national statistics? What typology is used to classify rural areas? On which criteria is it based? Are there different definitions/typologies used for specific studies?

Statistics Canada, the Canadian government agency in charge of administering census information in the country, usually defines *rural* based on geographical classifications. The most common criteria used in classification of rural territories are distance and population density, but other criteria could also apply (e.g. population size, distance from an urban area, distance to an essential service and so on). Individuals are classified as rural if they belong to a territorial unit classified as rural (du Plessis *et al.*, 2001). A series of hierarchical “building blocks” or territorial units has been defined for statistical and analytical purposes by Statistics Canada. In some cases, the territorial units also correspond to provincial legislated areas such as municipalities, counties, or regional districts.

Du Plessis *et al.* (2001) identify four relevant building blocks that serve as the base for statistical classification of census geography. The first is an “enumeration area” (EA), which consists of the group of households enumerated by one census enumerator. Groups of EAs are combined into “census subdivisions” (CSD). A CSD is defined as “an area that is a municipality or an area that is deemed to be equivalent to a municipality for statistical reporting purposes (e.g. as an Indian reserve or an unorganized territory)” (Statistics Canada, 2003). “Consolidated census subdivision” (CCS) is the third category in the hierarchy and corresponds to a grouping of adjacent CSD (Statistics Canada, 2003). The typical CCS is “where a small town (*i.e.* a CSD) is surrounded by a rural municipality (*i.e.* another CSD) and the two CSDs are grouped to form a CCS” (du Plessis *et al.*, 2001). Fourth, a “census division” (CD) is a higher order category that corresponds to “provincial legislated areas (such as county, municipalit  regionale de comt  and regional district) or their equivalents” (Statistics Canada, 2003). The provincial legislated areas considered as census divisions vary from province to province; they may include groups of municipalities such as cities, counties, municipal districts and rural municipalities (Alberta, Saskatchewan, Manitoba);

regional districts or municipalities (British Columbia); counties (Nova Scotia, Prince Edward Island, New Brunswick) or they can be “delineated without reference to administrative or other forms of division and are numbered” such as in Newfoundland and Labrador. The main purpose for the creation of these territorial units is to increase effectiveness in regional planning and delivery of services (Statistics Canada, 2008a).

Furthermore, du Plessis *et al.* (2001, p. 7) identify six different ways of defining rural. The first classification corresponds to “census rural”. This category refers to residents living in the countryside in centres with fewer than 1 000 persons. In terms of population density, they correspond to communities with fewer than 400 persons per square kilometre. Census rural is formed by grouping EAs. Likewise, “rural and small towns” (RST) refers to “individuals living in municipalities outside of commuting zones of larger urban centres with population above 10 000” (du Plessis *et al.*, 2001).

Two definitions from OECD are also commonly used when comparing rural population of OECD countries (Bollman, 2007a): “OECD rural” and “OECD predominantly rural regions”. OECD rural refers to communities with a population density of fewer than 150 persons per square kilometre. Likewise, a region is considered predominantly rural if more than 50% of its population lives in OECD rural communities (du Plessis *et al.*, 2001).

Another classification is “Beale non-metropolitan regions”. This definition of rural refers to population centres outside metropolitan regions with a population below 50 000 individuals and regions with no urban settlements (*i.e.* places with concentration of population above 2 500 persons). Beale regions are based on census divisions.

The last category refers to “rural postal codes”. This category includes individuals with a zero in their postal code and is based on Canada post geography (du Plessis *et al.*, 2001).

Du Plessis *et al.* (2001) point out the relationship between the geographical level used in each classification and the application of each definition. For example, census rural areas, which are based on EAs, are useful when dealing with localized issues. On the other hand, rural and small town classifications, based on census subdivision, are useful when visualizing issues at a community level, as well as for grouping individuals that belong to a similar type of labour market. Furthermore, an OECD rural community, which is based on consolidated census subdivisions, is useful for dealing with issues at a more aggregated level. Additionally, OECD predominantly rural regions and Beale non-metropolitan regions provide a level of aggregation useful for analyzing issues at the regional level. Likewise, rural postal codes are useful for analyzing databases with postal code designations where comparisons to other information that has been tabulated by postal codes are necessary.

Two additional classifications of places, “census metropolitan areas (CMA) and “census agglomerations” (CA), are needed to classify areas into urban and rural based on commuting patterns. A CMA is “a very large urban area (known as the urban core) together with adjacent urban and rural areas that have a high degree of social and economic integration with the urban core. It has an urban core population of 100 000 and over (based on the previous census)” (du Plessis *et al.*, 2001). Likewise, A CA has an urban core population of 10 000 to 99 999. It also includes all neighbouring municipalities in which 50% or more of the workforce commutes to the urban core (du Plessis *et al.*, 2001).

Different classifications of rural can be obtained by combining different definitions of rural. For example, du Plessis (2004) shows the cross-tabulation of two different definitions of rural for obtaining different groups of rural or urban population. “Large urban population centres” (LUCs) are defined by combining CMAs and CAs. These large centres include an urban core population of 10 000 or more, as well as other small urban areas with populations between 1 000 and 9 999 inside the LUC commuting

zone. On the other hand, the “LUC rural” category corresponds to rural areas inside the LUC commuting zone. These areas have a smaller population and lower density but greater access to large urban centres. Furthermore, two other groups of rural residents can be obtained by combining RST and census rural. The first group corresponds to “RST small towns”, which is an urban area with a population between 1 000 and 9 999 but outside the LUC commuting zone. These population centres have a relatively high population density but limited access to larger urban population centres. The other rural population group is “RST rural”, which corresponds to “rural areas outside the commuting zone”. RST small towns have a lower population density and less access to large population centres (du Plessis, 2004, pp. 5-6).

Another classification particularly useful for analyzing labour markets is the “census agglomeration influenced zones” (MIZs). According to du Plessis *et al.* (2001), “municipalities are assigned to a MIZ category based on the percentage of their resident employed labour force that has a place of work in the urban core(s) of CMAs or CAs”. Furthermore, a combination of the percentages of the employed labour force living in a particular CSD outside metropolitan areas and working in the urban core of any metropolitan area are combined to determine “the degree of influence” that a metropolitan area has on a CSD (du Plessis *et al.*, 2001). Based on the degree of influence of metropolitan areas, four different types of MIZs have been defined, according to du Plessis *et al.* (2001):

- The *strong* MIZ category includes CSDs with a commuting flow of 30% or more (at least 30% of the total employed labour force living in the CSD works in any CMA/CA urban core).
- The *moderate* MIZ category includes CSDs with a commuting flow percentage between 5% and 30% (at least 5%, but less than 30% of the total employed labour force living in the municipality works in any CMA/CA urban core).
- The *weak* MIZ category includes CSDs with a commuting flow percentage more than 0% but less than 5% (more than 0% but less than 5% of the total employed labour force living in the municipality works in any CMA/CA urban core).

Rural areas in the national economy

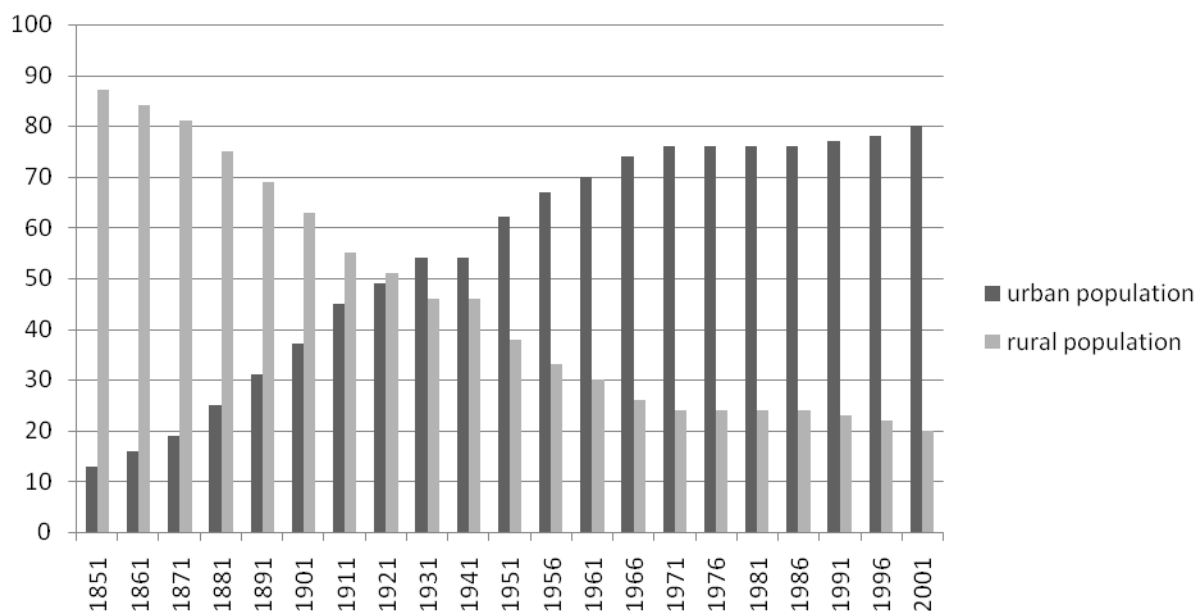
What is the share of rural areas in total population, land, gross domestic product (GDP) and employment? Statistics Canada usually refers to metropolitan and non-metropolitan areas when defining rural and urban populations. According to the 2006 census of population, 6 million Canadians (20% of the population) resided in non-metropolitan areas (small towns and rural¹ areas). Most Canadians (68%) are concentrated around 33 census metropolitan areas. Figure 1 shows a historical perspective of the growth in urban population in the country for the period 1851-2001. As can be observed, the share of urban to rural population has been increasing at a rate of approximately 2% every 10 years since 1966. Furthermore, according to Bollman (2007a), only 0.7 million of the census rural population lived in a census-farm operator household in 2001, which corresponds to 11% of the total census rural population.

In 2000, the total labour force (15 years and over) in rural areas (RST and census rural) was 3 133 500 individuals (19.6% share of Canada’s labour force), and the number of rural residents employed was 2 876 500 (57.4% of rural population) (Rothwell, 2001). Furthermore, rural males had a higher rate of participation in the labour force and employment than rural and urban females (Table 1). The difference in participation and employment rates between males and females in rural areas was approximately 15%.

1. The rural population for 1981 to 2001 refers to persons living outside centres with a population of 1 000 and outside areas with 400 persons per square kilometre Previous to 1981; the definitions differed slightly but consistently referred to populations outside centres of 1 000 inhabitants.

The participation rate of the labour force in rural areas, as well as the rate of employment, increased slightly during the period 1996 to 2000 (Rothwell, 2001). The participation rate, for example, increased from 61% in 1996 to 62.6% in 2000 and the employment rate increased from 55.1% to 57.4% during the same period (Table 1).

Figure 1. Share of urban –rural population, 1851-2001



Source: Statistics Canada, Censuses of Population, 1851 to 2001.

Table 1. Rural and urban labour force, 2000

	Population	Labour force	Employed	Participation rate	Employment rate
Canada	24 284 900	15 999 200	14 909 600	65.9	61.4
Large Urban Centres					
Total	19 276 200	12 865 700	12 033 100	66.7	62.4
Males	9 412 600	6 893 800	6 439 600	73.2	68.4
Females	9 863 600	5 972 000	5 593 500	60.5	56.7
Rural and Small Towns					
Total	5 008 700	3 133 500	2 876 500	62.6	57.4
Males	2 515 300	1 755 500	1 609 700	69.8	64.0
Females	2 493 400	1 378 000	1 266 900	55.3	50.8

Source: Adapted from Rothwell (2001) Table 2.

However, the increase in employment has been uneven across rural communities and activities. According to Bollman (2007b), communities depending on primary production will continue to experience losses in employment. The increasing cost of labour has motivated farmers to adopt labour-saving technologies. On the other hand, the decrease in the cost of transportation and improvement in communication systems have allowed advantaged rural communities to become competitive in

manufacturing especially in industries employing “just-in-time” inventory strategies. There has been an increase of about 0.13% points per year in the rural manufacturing labour force of RSTs during the past three decades.

The role of agriculture in rural areas

Questions addressed in this section include: What is the share of agriculture in land use, GDP and employment at the national level in rural areas or regions? What is the share of farm family members in the rural population? How have these shares evolved in the past two decades?

Agriculture’s share in land use

The number of farms in Canada has been declining over time, but the total amount of agricultural land base has remained practically unchanged (67.7 million hectares). During the period 1986-2006, for example, the number of farms decreased by 22% from 293 089 to 229 373 units, but farm size increased from 231 to 295 hectares (Table 2). Agricultural land represents 7.3% of the total land area of the country (Statistics Canada, 2007a).

Table 2. Total farm area, number and size of farms, 1986/2006

	1986	2006	Percentage change
Farmland (million of hectares)	67.8	67.6	0%
Average farm size (hectares)	231	295	22%
Number of farms	293 089	229 373	-22%

Source: Statistics Canada, Censuses of Agriculture.

Agriculture’s share of Gross Domestic Product (GDP) at the national level

Agriculture’s share of the Canadian GDP fluctuates with agronomic and marketing conditions. The GDP (at basic prices²) of agriculture, forestry and fishery (NAICS classification) was CAD 25.4 billion (chained dollars³) in 2003 and CAD 26.9 billion in 2007. During this period the sector’s contribution to total GDP fluctuated between 2.2% and 2.5%, 2007 was the lowest. Furthermore, the contribution of agriculture alone (livestock and crop production) to total GDP increased from 1.57% in 2002 to 1.71% in 2005 and then decreased to 1.58% in 2007 (Statistics Canada, 2008b). This reduction in GDP was due to a decrease in the total value of crops during the last two years (Table 3).

2. Statistics Canada expresses GDP in basic prices, which is measured as output valued at basic prices (subsidized prices less taxes on the products at the time of sale and separately invoice transport charges) less intermediate consumption valued at purchasers’ prices.

3. “Chain Fisher volume index: in May 2001, the quarterly income and expenditure accounts adopted the Fisher index formula, chained quarterly, as the official measure of real expenditure-based gross domestic product. there are two reasons for the adoption of this particular formula: it produces the most accurate measure of quarter to quarter growth in GDP and its components; and, the change brings the Canadian measure in line with the us quarterly income and product accounts which also use the chain fisher formula to measure real GDP” (Statistics Canada, 2007).

Table 3. Gross Domestic Product at basic prices, primary industries Canada, 2003-07

	2003	2004	2005	2006	2007
	millions of chained dollars ¹ (2002)				
All industries	1 091 378	1 126 802	1 160 024	1 193 905	1 224 319
Agriculture, forestry, fishing and hunting	25 478	27 685	28 437	27 847	26 930
% share on GDP	2.3	2.5	2.5	2.3	2.2
Agriculture and related services	18 783	20 652	21 611	21 218	20 846
% share on GDP	1.7	1.8	1.9	1.8	1.7
Only agriculture (crops and animal production)	17 091	18 940	19 870	19 533	19 326
% share on GDP	1.57	1.68	1.71	1.64	1.58

1. See footnote 3.

Source: Statistics Canada CANSIM table 379-0027.

Agriculture's share of Gross Domestic Product (GDP) in rural areas

There shares of rural GDP of primary industries such as agriculture and related services; forestry; and fishing and trapping sectors declined during the period 1986-2001, mining and oil sector was an exception. The agriculture sector's share of GDP dropped by 17%, the forestry sector's share fell by 4% and the share of the fishing and trapping sector declined by 51.9 %. In 2001, the overall share of primary industries in rural GDP was 22.7 % and the share of agriculture in rural GDP was 8 % (Preville, 2004).

Agriculture's share of employment at the national level

Table 4 shows relatively stable agriculture's share of employment during the period 2002-07. This share fluctuated between 2.0% and 2.1% (Statistics Canada, 2008c). This classification of agriculture based of NAICS classification includes crops and animal production as well as crop and animal support activities.

Table 4. Agriculture's share of employment, Canada, 2002-07

	2002	2003	2004	2005	2006	2007
All industries	15 310.4	15 672.3	15 947.0	16 169.7	16 484.3	16 866.4
Agriculture	325.4	332.4	326.0	343.7	346.4	337.2
Share (%)	2.1	2.1	2.0	2.1	2.1	2.0.

Source: Statistics Canada CANSIM, Table 282-0008 and Catalogue No. 71F0004XCB.

Agriculture's share of employment in rural areas

In determining the agriculture sector's share of employment in rural areas it is worth to point out that "agriculture is not only rural" and "rural is not only agriculture" (Chartrand, 2005). Using OECD classification of rural areas, Chartrand (2005) reports that, in 2001, only 6% of the rural population was employed in primary agriculture (*i.e.* farming). On the other hand, not all agricultural activity was in rural

regions. According to Chartrand, 71% of agricultural activity was done in predominantly rural regions, 16% was done in intermediate regions and 13 % was done in predominantly urban regions (Table 5).

Table 5. Distribution of employment by industrial sector and type of region, 2001

Industries	Predominantly urban regions	Intermediate regions	Predominantly rural regions	All regions
Employment in primary agriculture	52 435	67 100	290 075	409 610
Employment in agri-food	894 905	364 750	548 070	1 807 725
Employment in all sectors	7 988 585	3 071 020	4 516 935	15 576 540
Number employed as percent of employment in the sector (per cent)				
Employment in primary agriculture	13	16	71	100
Employment in agri-food	50	20	30	100
Employment in all sectors	51	20	29	100

Source: Statistic Canada, Census of Population 2001 (adapted from (Chartrand, 2005 p. 11)

Agriculture's Share of Population in Rural Areas

Table 6 shows a decline in farm population's share of total population during the period 1996-2001 from 3% to 2.4 %. Likewise the share of farm population in rural population also declined from 12.9% to 11.5 % (Statistics Canada, 2004). More recent information on total farm population indicates that during the inter-census period 2001-2006 the number of farm operators declined by 5.5% (Statistics Canada 2007b).

Table 6. Farm population as a share of total population and rural population, 1996-2001

	1996	2001	1996 to 2001
	Number		Change (%)
Total farm population ¹	851 405	727 130	-14.6
Rural farm population	819 095	695 750	-15.1
Urban farm population	32 310	31 380	-2.9
Farm population as percentage of total population	3.0	2.4	...
Rural farm population as percentage of total rural population	12.9	11.5	...
Rural population as percentage of total population	22.0	20.2	...

1. Refers to all persons who are members of a farm operator's household, living on a farm in a rural or urban area.

Source: Statistics Canada Censuses of Agriculture and Population.

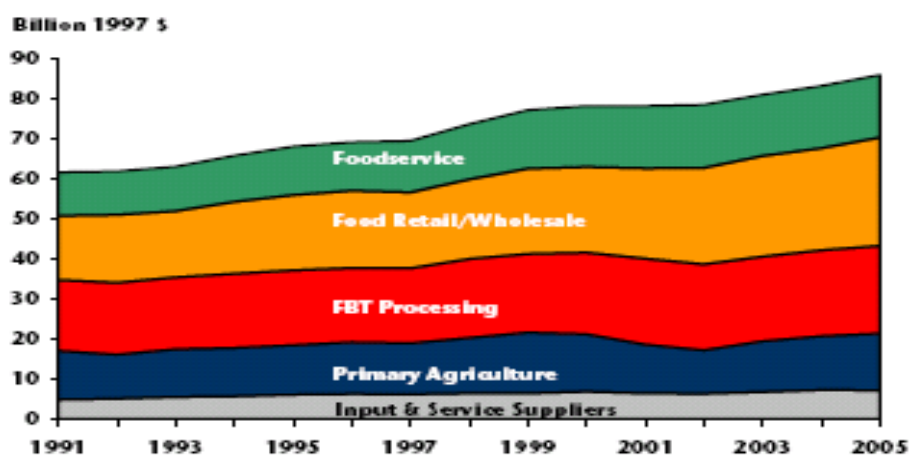
The role of agri-food industries in rural areas

Questions addressed in this section include: what is the share of agri-food industries (upstream and downstream) in GDP and employment at the national level in rural areas or regions?

Share of agri-food industries in gdp and employment at the national level

Figure 2 (Agriculture and Agri-Food Canada, 2007a, Chart B1.2 p. 32) shows the trends in GDP contribution from the agri-food systems, which includes the farm input market, primary agriculture, food, beverage, and tobacco processing (FBT), and wholesale and retail sectors. The total contribution of the sector as a whole increased to more than CAD 20 billion during the period 1991-2005, with an average annual growth of 2.4%. The sectors with the highest growth were wholesale and retail sales and FBT. Contribution of primary agriculture has remained relatively stable. According to Agriculture and Agri-Food Canada (2007a), most of this growth was influenced in part by an increase in exports of consumer-oriented products.

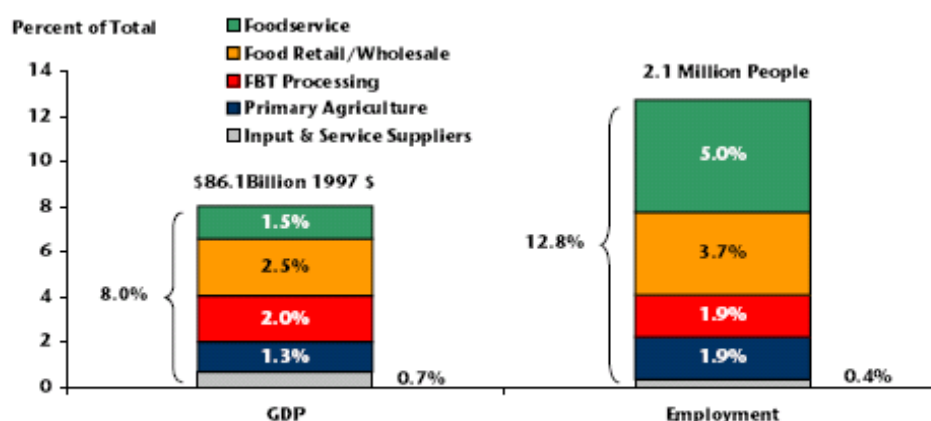
Figure 2. The agriculture and agri-food system contribution to GDP, 1990-2006



Source: Statistics Canada and AAFC calculations.

Furthermore, Figure 3 (Agriculture and Agri-Food Canada, 2007a, Chart B1.1, p. 32) depicts a disaggregation of the GDP contribution of the agri-food system by category for the year 2005. The total contribution of the system to GDP was 8%; greater shares corresponded to food retail and wholesaling (2.5%) and FBT (2.0%). With respect to the share of employment, the sector employed 2.1 million individuals, corresponding to 12.8% of the total employment in the country. The food service sector alone was responsible for 5% of the total employment, followed by food retail and wholesale.

Figure 3. The agriculture and agri-food contributions to GDP and employment, 2005



Source: Statistics Canada and AAFC calculations.

Forestry's share of land use at the national level in rural areas or regions

Of Canada's 979.1 million hectares of land, 402.1 million hectares are forests or other wooded land (treed wetlands, as well as slow-growing and scattered-treed land). A relatively large proportion of the wooded areas (244.2 million hectares) have between 80% and 100% coverage by trees, and 361.3 million hectares, mostly in the northern territories and part of the prairies, have less than 5% forest and other wooded land (Table 7).

Table 7. Forest and other wooded land, 2001

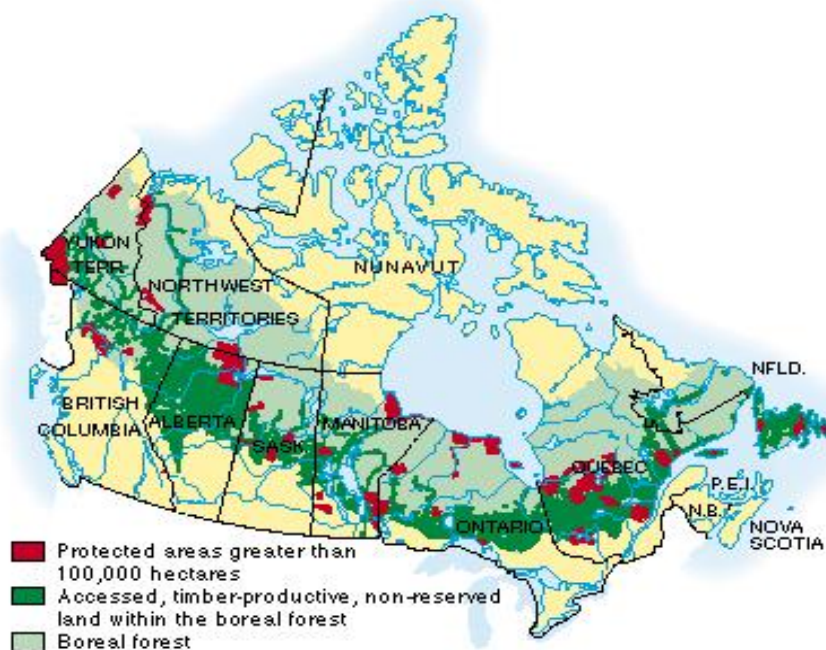
Percentage of forest and other wooded land	Total area (Million hectares)	Area forest and other wooded land (Million hectares)
0-<5	361.3	1.2
5-<20	68.8	8.0
20-<40	72.6	21.6
40-<60	82.3	40.8
60-<80	122.6	86.3
80-100	271.5	244.2
Total	979.1	402.1

Source: Canada's Forest Inventory (2001), Natural Resources Canada (2007a).

Furthermore, most of Canada's potential for commercial forest activity remains unexploited. According to the Canadian Forest Service (2007a), 294.8 million hectares out of 310.1 million hectares of forest land are "not reserved", the remaining 92 million are classified as "other wooded land", which means that 402 million hectares of forest can be exploited for commercial use (Figure 4). Timber and a variety of other products, (maple products, Christmas trees, foods, specialty craft products, and recreational and aesthetic benefits) can be obtained from these forests (Canadian Forest Service, 2007). Nevertheless, less than 50% of the forest land suitable for commercial use (143.7 million hectares) is actually being managed, and only 0.4% (0.9 million hectares) is harvested each year. About 150 million hectares are not being accessed or managed for timber production. In addition, the Canadian Forest Service (2007) estimates that "approximately 107 million hectares of non-commercial forested land; land that is more suitable to non-timber values, is unlikely ever to be harvested".

The forestry and logging industries contribution has been less around 0.5 % and it has been declining overtime. According to Statistics Canada (2008b), the contribution of this sector to total GDP declined from 0.53% in 2003 to 0.43% in 2007 (Table 8). Likewise, the forestry sector’s share of employment (payroll employment) during the same period declined from 0.54% to 0.41%. However, according to Dechka *et al.* (2003), the sector “supports a multibillion dollar recreation and tourism industry”, which depends on sustainable management of the natural resources.

Figure 4. Protected areas and commercial forest land



Source: National Conservation Areas Database (NCADB), Environment Canada, Ottawa.

Table 8. Share of GDP and employment of the forestry sector

	2003	2004	2005	2006	2007
Gross Domestic Product (millions of chained dollars¹, 2002)					
All Industries	1 091 378	1 126 802	1 160 024	1 193 905	1 224 319
Forestry and logging	5 756	6 182	6 168	5 896	5 278
% share	0.53	0.55	0.53	0.49	0.43
Employment payroll employment					
All industries including unclassified enterprises	13 226 306	13 425 693	13 692 853	14 032 677	14 306 826
Forestry, logging and support	71 338	71 399	68 970	64 189	58 409
% share	0.54	0.53	0.50	0.46	0.41

1. See footnote 3.

Source: Statistics Canada, CANSIM table 379-0027, CANSIM 282-0008 and Catalogue no. 71F0004XCB.

Diversification of activities by farm households in rural areas

Questions addressed in this section include: What activities are farm households engaged in, on the farm and outside? To what extent are they related to farm activities? Do they take place on or off the farm? What is the number of farms engaged in these various non-agricultural activities? Which members of the farm household are engaged in non-agricultural activities? What is the share of farm household income derived from the various non-agricultural activities?

Farm households' participation in non-agricultural activities may be divided into off-farm employment, value-added activities and non-farm businesses. Off-farm employment refers to paid work done by farm household members outside agriculture. Value-added activities refer to activities done by farm household members on or off the farm to add value to the farm products or farm assets and may include processing of agricultural products, farm tourism or direct selling of farm products. Non-farm business refers to the operation of non-agricultural business by farm households and can include activities such as repair services, transportation services, commerce or professional services (Bollman, 2001; Mendoza, 2008).

Off-farm employment

Table 9 presents the changes in off-farm employment during the year previous to the Censuses of 2001 and 2006. Participation in some form of off-farm work increased by 3.9 percentage points during the period evaluated, reaching 48.4% in 2006. Likewise, the percentage of farm operators reporting full-time off-farm work increased from 17.6% to 20.2% during the same period, and the proportion of farmers working full-time at the farm decreased by one percentage point. Analysis of participation by gender indicates a higher grow in participation of female than of male operators.

Table 9. On- and off-farm work, 2001-06

	2006		2001	
	Number of operators	Percentage of operators	Number of operators	Percentage of operators
Men	236 220	72.2	255 015	73.7
Women	90 840	27.8	91 180	26.3
Work on farm in year previous to Census				
More than 40 hours per week	152 630	46.7	165 200	47.7
Work off farm in year prior to census				
More than 40 hours per week	66 160	20.2	60 870	17.6
Work off farm in year prior to census				
Total	158 255	48.4	154 215	44.5
Men	112 495	47.6	112 605	44.2
Women	45 760	50.4	41 610	45.6

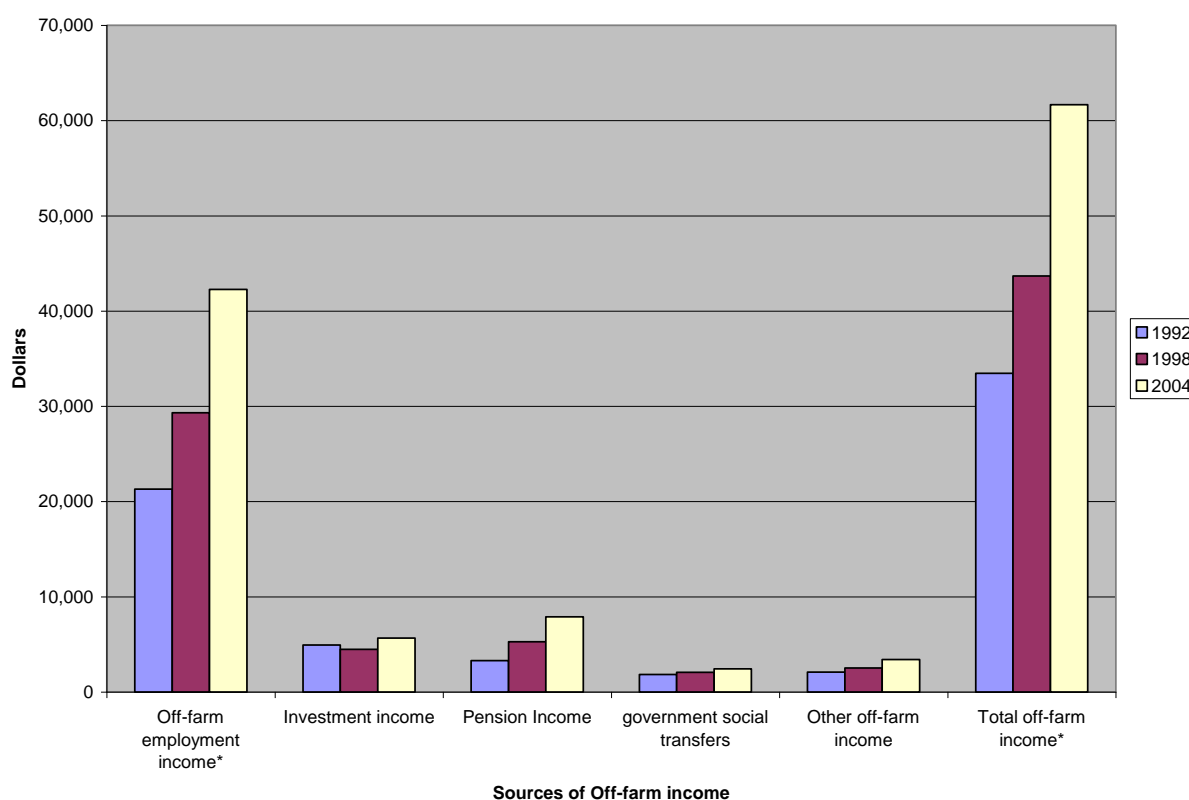
Source: Statistics Canada, Census of Agriculture, 2001 and 2006.

Farm households associated with farms with gross revenues below CAD 250 000 are more likely to rely on off-farm employment and other sources of non-agricultural income (such as pensions, subsidies, interest from investments and so on) than farmers with higher incomes (Alasia *et al.*, 2007). In 2001, 93%

of farm operators reporting off-farm employment operated farms that generated gross farm receipts of less than CAD 205 000 (Alasia *et al.*, 2007). Furthermore, in 2005, the average income earned by farm operators was CAD 54 700, with 60% of income derived from off-farm sources (Statistics Canada, 2008). Most self-employed farmers with no employees have farming activity as a second economic activity (Alasia *et al.*, 2007, Bowlby, 2002).

Figure 5 shows the different sources of off-farm income per family for the years 1992, 1998 and 2004 (Agriculture and Agri-Food Canada, 2007b). Off-farm employment income represented 64% of total off farm-income in 1992, and its share increased to 69% in 2004. It is worth to clarify two characteristics of the calculation of these figures: 1) the calculation of off-farm employment income includes farm wages paid to family members and 2) the total off farm income does not include taxable capital gains.

Figure 5. Off-farm income per family by source, 1992, 1998 and 2004



Source: Agriculture and Agri-Food Canada, 2007b, p. 9.

Value-added activities

In 2003, 18% of Canadian farmers used non-bulk or non-traditional methods to market their products. Sixty-five percent of them sold directly to consumers through farmers' markets/roadside stands/pick-your-own, 18% sold directly to retail stores or restaurants, 5% exported and 13% processed a product on the farm or owned a plant. The rest (13%) had investments in processing companies or cooperatives (Statistics Canada, 2005). Most of these activities involved the participation of the farm operator and spouse (Mendoza, 2008). However, there was a relatively higher level of participation in value-added activities in farms where the responsible for the farm operation was a woman (Mendoza, 2008).

Most value-added activities are directly related to the farm because direct selling or processing is done at the farm (e.g. pick-your own, farm tourism, farm shops, roadside stalls, bakeries and so on) or involve products from the farm. However, some of the processing and direct-selling activities (e.g. farmers' markets, delivery) take place off the farm (Mendoza, 2008).

Statistics Canada (2005) reports gross revenue obtained by farmers using non-bulk or non-traditional methods or value-added processing in 2002. Twenty-eight per cent of farmers reported gross annual revenues of CAD 25 000 or more; 30% reported revenues between CAD 5 000 and CAD 25 000; and 42 % reported revenues of CAD 5 000 or less. More than half of farmers with very large business-focused farms reported gross revenues above CAD 50 000, and more than 40% of farmers with horticultural operations reported gross incomes above CAD 50 000 using alternative marketing methods and/or value-added (Statistics Canada, 2005).

Non-farm business

Most of these non-farm businesses developed by members of the farm household are related to services and commerce. The most recent information available at the national level (Bollman, 2001, p. 11) indicates that in 1996, approximately 15% of all operators of census farms reported operation of "another business (other than farming)". From the total of all census-farms, 7% of farm operators reported operation of a business in the service sector, 4% reported business in the sales sector, 3% had a construction business and 1% were in the manufacturing sector. Another 1% reported businesses in other sectors. Bollman (2001) estimates that households reporting non-farm business can obtain an average net income ranging between CAD 12 000 and CAD 63 000 (depending on the size of gross or net cash farm income).

Biofuel production

Ethanol, mainly derived from wheat and corn, is a growing biofuel industry in Canada and it is promoted by the federal government. According to Forge (2007), the annual biofuel production is approximately 840 million litres and is expected to reach 2.74 billion litres by 2010. The promotion of biofuel production started in Canada in the mid-1990s through tax incentive measures (federal tax waived by 10 cents per litre of ethanol blended with gasoline and 4 cents per litre for biodiesel). In addition, the government developed a program aimed at protecting producers from negative impacts of changes in biofuel-related policies and another directed to support investment in the expansion of the ethanol industry. Another ethanol-supporting policy was launched in 2006 with the purpose of promoting biofuel consumption. The main goal of the policy is to increase biofuel consumption to 5% of the total fuel consumption in the country by 2010 (Forge, 2007).

Impacts of biofuel production

Canada's goal for 2010 of replacing 5% of total fuel consumption with biofuel may have an impact on demand and price of agricultural commodities used for its production (e.g. corn, canola, wheat). To produce the 2.74 billion litres of ethanol and 0.36 billion litres of biodiesel needed to accomplish this goal, the industry will need about 4.6 million tonnes of corn, 2.3 million tonnes of wheat, and 0.56 million tonnes of canola, according to estimates made by Agriculture and Agri-Food Canada (cited by Forge, 2007). These figures represent a demand of 48% to 52% of the actual corn that is seeded, 11% to 12% of the wheat and approximately 8% of the canola. Another impact of this new demand is the increase in the price of corn, wheat and canola. For example, the United States Department of Agriculture estimates that ethanol production adds 25 cents to 50 cents to the price of a bushel of corn (Forge, 2007). The impact of ethanol production based on corn could also be observed in the increase in world grain stocks and prices, according to the Food and Agriculture Organization (cited by Forge, 2007). High demand for corn also affects the price of substitutes for animal feed (corn, sorghum, wheat, soybeans, cotton and rice) from 4%

to 14% because these crops compete for the same land and that net farm income had increased by 0.3%. However, some experts believe that the impacts of ethanol production based on corn could be considerably diminished with the implementation of more efficient technologies for corn production, with the reduction in corn exports and with the use of other animal feed as corn substitutes (Forge, 2007).

On the other hand, it is alleged that the replacement of traditional fuels by biofuels will reduce the greenhouse gas emissions and assure energy security in the country. Creation of additional employment in rural areas is also expected with the establishment of biofuel plants. However, estimates indicate that the impact of replacing 10% of the conventional fuels with corn-based ethanol will reduce greenhouse gas emissions by 1%. Furthermore, given that Canada is a net exporter of energy, it needs biofuel production to assure energy sufficiency (Forge, 2007).

Factors enhancing/limiting farm household diversification into non-agricultural activities

Questions addressed in this section include: What are the main factors explaining farm household diversification (or the lack thereof) into non-agricultural activities: the general economic situation (employment), accessibility/connections, attractiveness, regulations and policies?

Factors influencing the probability of farmers' participation in off-farm employment

Alasia *et al.* (2007) report the probability of farmers' participation in off-farm work. They found that participation in off-farm work is influenced positively by higher levels of education and the presence of more than one farm operator associated with the farm operation, as well as by local and regional characteristics such as high local employment rate, low regional unemployment rate and a more diversified regional economy. In comparing the effects of regional and local characteristics on off-farm work the authors report that "family, community and regional characteristics appear more relevant in determining the joint decision to work off-farm and operate a smaller holding, compared to the decision to work off-farm and operate a larger holding" (p. 3). On the other hand, Howard and Swidinsky (2000) report a negative effect of education on off-farm employment. However, these authors also report that "for those farmers who do work off-farm, education increases the number of hours worked off-farm". In addition, they found a positive influence of wages in off-farm labour participation.

Additionally, Alasia *et al.* (2007) identify factors that have a negative effect on the probability of farmers' participation in off-farm work. Some of these factors are: dairy production (dairy production is used as a proxy for labour intensive activities); size of the farm in terms of land area, capital investment and sales (the larger the farm the lower the probability of participation), and hired non-family labour (the operator usually has to be present for supervising farm work). Additionally, these authors found that "increasing the complexity of the business structure apparently increases the value of on-farm work by the operator and decreases the probability of off-farm employment compared to a sole proprietorship; this is particularly evident for corporations" (p. 18). Furthermore, years of farming experience also influence negatively the probability of off-farm work (Howard and Swidinsky, 2000).

Moreover, Alasia *et al.* (2007) report a negative influence of farm proximity to urban centres, in particular for operators of smaller census-farms. In this respect, the authors suggest that it could be an indication that "this joint decision [of participation in off-farm work], in fact, is more related to the dynamics of the local labour market" (p. 3). Furthermore, they argue that such results suggests that farmers' decisions to participate in off-farm work "is more likely to be affected by policy initiatives that directly address the dynamics of labour markets in the community" and less influenced by urban employment opportunities.

Factors affecting farm household diversification into non-agricultural activities

The market for products and services derived from farm diversification activities, in particular the ones related to direct marketing and entertainment activities, looks promising, given that consumers have developed tastes and preferences for natural products and that they, more than ever, enjoy a relatively high discretionary income. On the supply side, there are a series of initiatives, developed by government and private agencies, conducted for the promotion of these types of activities.

According to a survey of Canadian farmers conducted by Mendoza (2008), the main motivations for farm household diversification into value-added activities in Canada were to increase profitability of the farm operation and increase the chances of survival of the farming operation as well as to be able to maintain a farm lifestyle. However, profit maximization is not always the primary motive for diversification. Survival of the farm business is often a key element in the decision to undertake value-added activities, as well as better use of farm resources, and an increase in socialization with urban consumers. Value-added activities tend to be especially important for operators of small farms.

Nevertheless, there are a series of obstacles and constraints that affect the operation of value-added activities. The most relevant factors identified by farmers were: regulations, availability of capital, lack of marketing skills and insufficient technical support. Furthermore, human and social capital characteristics such as farmers' innovation skills, university education and participation in organizations influence positively the likelihood of farmers' engagement in value-added activities. It is also more likely that Canadian farmers will participate in these types of activities if they are dedicated to production of perishable products (*e.g.* fruit and vegetables). Farming experience affects participation negatively (Mendoza, 2008).

Participation in non-farm business is positively influenced by managerial abilities, business experience and participation in off-farm employment. University education and production of perishable products are factors that reduce the probability of farmers participating in non-farm businesses (Mendoza, 2008). Farm size (in terms of gross annual revenues) also affects farmers' participation in non-farm businesses. In 1995, 16% of farm households with gross annual farm revenues below CAD 100 000 had operators or family members operating a non-farm business. On the other hand, only 2% of farm households with farm gross annual revenues above CAD 250 000 reported non-farm business.

The regulatory environment for farm diversification activities

The majority of provinces in Canada do not have a specific department or ministry that deals with farm-diversification or value-added activities. Usually, there are several federal, provincial and municipal agencies involved in the promotion of activities related to rural tourism, as well as development and enforcement of laws and regulations that affect the sector. In the case of Alberta, for example, Williams *et al.* (2001) found that despite the province's lack of official legislation on agri-tourism, the Alberta Agriculture, Food and Rural Development Department coordinates and promotes a series of initiatives for the promotion of rural tourism. In addition, given the varied nature of these types of activities, different government agencies participate in one way or another in regulations regarding road and highways signage, bylaws for the operation of rural accommodation facilities, fire codes, health and food safety regulations regarding food preparation for human consumption, land planning, and so on.

Furthermore, an example of the varied types of regulatory agencies, as well as the types of laws and regulations these agencies administer and enforce, is illustrated in a study conducted by the Ministry of Agriculture, Food, and Fisheries (2002) of British Columbia. The provincial government is mostly responsible for broader regulations, which range from land use stipulations in the Agricultural Land Reserve Act to health concerns in the Health Act. Local governments, on the other hand, usually deal with

laws and regulations related to zoning and development considerations. Lastly, the federal government deals with regulations predominantly related to food safety, food standards, trade and packing. In addition, the study indicates “there are 154 municipalities and 27 districts with the power to make by-laws in the province”. Furthermore, with respect to the types of regulations that affect rural tourism in British Columbia, the study indicates that the province has 35 separate laws and regulations that directly or indirectly affect the development of agri-tourism activities.

Policy initiatives for the promotion of value-added activities in rural Canada

The available support for developing new businesses in rural areas is usually oriented toward small business in the downtown areas of rural communities. Most of these programs are developed in partnership between government agencies and local organizations and are directed toward individual entrepreneurs, groups or local partnerships. Some of these programs have as their main objective the development of the skills and capacity of stakeholders to elaborate on and evaluate business plans and to provide starting capital needed for establishing new ventures. In addition, in most communities there are a series of business development services (*e.g.* accounting services, business counselling, quality control and export promotion programs financial services) available to assist entrepreneurs in the establishment and operation of new enterprises. The use of the Internet is also becoming a widespread service in many rural communities; for example, computer usage among farmers increased from 3% in 1986 to 46% in 2006 (Agriculture and Agri-Food Canada, 2007a).

Some of the business development initiatives directed toward value-added activities have been promoted through the Agricultural Policy Framework. These programs are directed at increasing the competitiveness of the agriculture and agri-food sector by improving food safety and the quality of processing plants involved in processing food or drink for human consumption. However, most of the programs do not contemplate the promotion of small-scale value-adding initiatives developed on the farm (Agriculture and Agrifood Canada, 2007a).

In addition, there are a series of producer associations, including farmers’ markets associations and other local development agencies that, in one way or another, support farmers’ initiatives related to value-added activities. Some the most common activities developed by these associations include assistance with information, advice, training in production, product handling and advertising and marketing of their products.

Likewise, farmers’ markets, which are organized into provincial associations, are present in many local communities across Canada. For example, in Ontario these producers’ initiatives are supported by the Ontario Ministry of Agriculture Food and Rural Affairs, as the Farmers’ Market Ontario Web site indicates. In addition, a series of partnerships among municipal government, local business groups and farmers is creating the proper environment for the resurgence of farmers' markets (Farmers’ Market Ontario, 2007). Farmers’ markets associations, apart from providing an outlet for direct selling, also provide additional services to farmers such as advertising, providing updated information and organized educational sessions about issues of interest to farmers related to marketing, regulations, food safety, and so on, and developing promotional campaigns that encourage consumers to buy fresh and local.

Incentives for biofuel production

“This government strongly supports the development of biofuels, which will lead to new markets for our farmers, help reduce greenhouse gas emissions, and create new jobs for our cities and towns,” said Minister Ritz (cited by Natural Resources Canada, 2007b).

The Government of Canada has expressed support for the promotion of biofuel production through a series of policies. In this regard, in July 2007, the Minister of Agriculture and Agri-Food and Minister for the Canadian Wheat Board announced a CAD 1.5 billion investment over nine years. The purpose of this policy is to create incentives for a greater participation of the private sector in ethanol production. As part of the incentives, “producers of ethanol and other renewable alternatives to gasoline will be eligible for incentives of up to 10 cents per litre of production; biodiesel producers can receive incentives of up to 20 cents per litre, for the first three years” (Natural Resources Canada, 2007b).

Focus on farm tourism

Questions addressed in this section include: Is farm tourism developed? What are the tourism services provided by farm households (housing, meals, recreation)? What are the factors explaining the development (or lack of development) of farm tourism?

“Tourists are more likely to be drawn to mountains, tundra, icebergs, northern lights, whale watching, pristine lakes, polar bears and white-water rapids and are less likely to be drawn to an agricultural vista.” (Bollman, 2007b, p. 12).

Rural tourism activity in Canada, measured in terms of “leisure tourist visits to Canadian destinations”, was 211 million visits. Most of these visits (83%) were made by Canadian tourists, followed by US travellers (12%) and other international visitors (5%). More than 85% of tourist visits to predominantly rural regions were made by Canadians. Canada’s tourism industry, either in predominantly urban or predominately rural regions, generates approximately 3% of the total employment (Beshiri, 2005).

National statistics on farm tourism are not readily available. However, studies at the provincial level on agri-tourism activity provide important information about these types of activities. Cultivating Tourism states that British Columbia’s agri-tourism industry employed 4 400 people in 2003, 25% in full-time year round positions and 29% in full-time seasonal jobs. The average operator generated revenue of CAD 98 000. In addition, Williams *et al.* (2001), citing BCVS, reports that in British Columbia about 2.3% of resident travellers visited a farm or winery in 1995-96. In addition, in 2000, the British Columbia Ministry of Agriculture (cited by Williams *et al.*, 2001) inventoried 258 agri-tourism operations listed in existing agricultural and tourism marketing brochures and directories. Agri-tourism operations usually offer “more than one attraction at the same time as Williams *et al.* point out:

“...while these operations were engaged in a wide variety of pursuits, the largest proportion of them were involved in the sale of various forms of fresh produce (40%) and wine products (24%). Several of the operations inventoried are also engaged in the sale of ranching experiences (14%), flowers and plants (12%), processed foods (11%), U-Pick activities (11%), bed and breakfast accommodation services (11%), as well as the distribution of fresh meats (10%)” (vi).

Likewise, Farmers Markets Ontario estimates that 27,000 people work in that sector alone, generating CAD 596 million in sales and a CAD 1.8 billion impact on the provincial economy. Moreover, a study presented by Criterion Research Corp (2003) to the Alberta Agriculture, Food and Rural Development stresses the broad appeal that agri-tourism activities has for the great majority of the respondents. When asked about the possibility of taking part in at least one agri-tourism activity, 88% of the respondents indicated this possibility as “very likely”. As in the case of other provinces such as Ontario, visiting a

farmers' market is the most popular related activity among residents. Other popular activities in which British Columbians are more likely to participate include country fairs and rodeos. Other activities that seem to be in demand are food-related activities such as sampling regional foods, visiting a market garden, or attending fall country suppers. Horse-related activities related to experiencing the cowboy lifestyle or riding horses on the prairies are also becoming popular (Criterion Research Corp., 2003).

The types of agri-tourism activities developed in an area are in part determined by tradition and specific characteristics of the region. For example, Alberta and British Columbia have the most well-known vacation ranches, which are based on working cattle ranches where tourists can go and spend a week living a "real" ranching lifestyle. The most frequently offered activities provided at these establishments include: nature viewing (including birds, deer, elk and moose), viewing and learning about farm lifestyles and society, hunting and photography. Most agri-tourism activity occurs during the summer/autumn season, with winter activity limited to a few operators offering activities such as snowmobiling, wildlife viewing and dinner parties (Williams *et al.*, 2001).

In Ontario, on the other hand, the most popular farm tourism activities are related to pick-your-own, winery tours, school bus tours and other farm entertainment activities. It is also common for a farm to offer a combination of different products and services, which may vary by season, in particular when value-added activity constitutes an important source of income and employment for the farm household. Likewise, according to Williams *et al.* (2001) cited by Mendoza (2008), in Saskatchewan "the current product mix includes fixed attractions (*e.g.* historic farms and agricultural heritage museums), events (*e.g.* agricultural conferences/conventions, rodeos, fairs and exhibitions, historic events), and services (*e.g.* accommodation, catering and tour operations)." Moreover, farmers from Quebec also offer a great variety of value-added products and services. However, some distinguishing agri-tourism products and services "are offered by maple syrup operations, honey producers, wineries, cheese producers, as well as accommodation, food service and agricultural events suppliers" (Williams *et al.*, 2001). Furthermore, agri-tourism activities, in particular those related to pick-your-own operations, entertainment and farm accommodations can be found in the Maritime Provinces.

Multiplier effects of agriculture and other rural activities

Questions addressed in this section include: What are the multiplier effects of agriculture in rural economies compared to those of agri-food industries, farm tourism, public services or any other activity?

Economy multipliers for the agriculture and agri-food sector

A multiplier effect from the agri-food system impacts the generation of additional GDP and employment in other economic sectors. According to Agriculture and Agri-food Canada (2007a, p. 35), for example:

"...for every CAD 1 of direct GDP created in primary agriculture, an additional CAD 1.8 of GDP is indirectly created, and for every job created another 0.91 indirect jobs are created in the economy. For every CAD 1 of direct GDP created in the food-processing industry, an additional CAD 1.81 of GDP is indirectly created in the economy. Similarly, for every job created by this activity, another 2.55 jobs are indirectly created."

Table 10 shows some examples of the multiplier effect of the agri-food system as impacts on GDP and employment. For example, for every dollar of GDP created in food processing, the multiplier effect on the ratio of total to direct GDP is 2.81 and in total to direct employment reaches 3.55.

Table 10. Economy multipliers for agriculture and agri-food

For every CAD 1 created in:	Impact on GDP and Employment	
Industry/Commodity	Ratio of total to direct GDP	Ratio of total to direct employment
Primary Agriculture	2.80	1.91
Total food processing	2.81	3.55
Sausages	2.80	3.24
Pork	2.81	2.01
Potatoes	1.69	1.40

Source: Statistics Canada Input/output Model, 2003 cited by Agriculture and Agri-Food Canada (2007a).

Conclusion

The information presented in the paper point out some of the unusual characteristics and ironies of agriculture.

- A relatively low percentage of the rural Canadian population is devoted to agricultural activities and much of the broadly defined agricultural activities do not occur in rural areas. Only 6% of the rural population are members of farmer families. On the other hand, almost 30% of farming production occurs in intermediate and metropolitan areas (Chartrand, 2005, p10). As Bollman (2007b) pointed out “agricultural policy would appear to have a weak demographic overlap with ‘rural’ and rural development policy”.
- The so-called 80:20 rule applies to agricultural production: large and very large farms (with sales of CAD 250,000 and over) represented 17% of all farms in 2006 but accounted for three-quarters of farm production (Agriculture and Agri-Food Canada, 2007a).
- Despite the decline in the total number of farms during the period 2001-2007, the total agricultural land under cultivation has remained the same at about 67.7 million hectares. Farms are becoming larger.
- Despite the fact that agriculture is generally a declining activity in rural areas, some communities are growing in population and employment. According to Bollman (2007b) with advances in technology, reductions in the cost of transportation of goods and improvements in communication systems, many communities in Canada have become more competitive in manufacturing. Niche marketing for specialty and value-added products, including biofuels, nutraceuticals products as well as recreational and environmental services represent strategies that entrepreneurial communities are adopting to improve their economies.
- Most of the agri-food sector is not farm-related. Primary agriculture (farming) represents only 16% of the GDP and 15% of the employment generated by the total agri-food sector.
- Farming is neither the main source of farmers’ employment nor their main source of income. In 2005 less than 50% of farmers reported working more than 40 hours per week in farming activities. On the other hand, almost half of them reported off-farm work in the year previous to the last 2006 census of agriculture. According to Alasia *et al.* (2007) during the period 1996 to 2001 there was a decline of 11% in the number of census farm operators in rural Canada accompanied by a 6% rise in off farm employment.

- While remote rural communities are struggling to retain a critical mass of residents, particularly young residents, the trend in rural agriculture and manufacturing is towards more capital intensive technologies, providing little new employment for rural residents.
- The rural economy, both farm and non-farm is closely tied to nearby urban centers. According to Olfert (2006) and Bollman (2007b) the highest rates of growth in rural and small towns has been in areas strongly influenced by urban areas. For example according to Bollman (2007b) communities more than 50 km from a CMA with over 100 000 inhabitants, on average, find that their share of total population is declining.
- On average, farmers are wealthier than the average Canadian. In 2002, farmers' net worth (assets less debts) was CAD 751 000. On the other hand, the average net worth of Canadian in 2006 was 148 350 (Statistics Canada, 2006).

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