

Economic Impact of Agriculture on the Economy of Prescott, Russell, Stormont, Dundas and Glengarry Counties

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Executive Summary

Over the last 50 years, rural areas in Ontario and across Canada, have experienced a decline in the number of farms and farmers. This has reached the point where, in most rural areas, the number of jobs in the service sector exceeds the number of jobs in agriculture. Many rural areas appear to have taken the position that agriculture is dead and strategies for the future must focus on services and other job producing sectors that do not depend on agriculture. People active in the agriculture sector accepted this initially, but more recently, began to believe that the decline of agriculture was perhaps being overstated.

Recognizing this problem, a number of counties in Ontario began to look at the broader role of agriculture in their economy. They approached the University of Guelph to assist them in this work. The first study completed looked at the largest agricultural county in the province, Huron County (Cummings, Morris, McLennan, 1998). This is the second study of its type in Ontario and focuses on the role of Agriculture in the economies of Prescott, Russell, Stormont, Dundas and Glengarry counties. As in the other studies of this type which are completed or underway, the basic focus is on sales and jobs related to agriculture, directly or indirectly. Since five counties are involved in this study, we have chosen to present data for each of the five counties, for the region as a whole and for Ontario.

The jobs and sales data indicates that there are 17885 jobs (19% of the region's total) tied to agriculture in the five counties and 1.12 billion in sales per annum. The multipliers indicate that for every job in agriculture, there are two additional jobs outside agriculture. In the sales area, for each dollar in sales in agriculture there are \$2.07 in sales in ag related businesses. Further details follow.

The study started with a review of secondary data on the economy of the region in comparison with Ontario. There were 88,125 employees in the five counties in 1996, a situation very similar to that in 1991. Russell County was the fastest growing in employment terms during 1991-1996, while Stormont actually experienced a decline. A review of family

income levels in the five county region showed that income levels were generally lower in the region than in Ontario as a whole. Russell county had the highest levels of family income and Prescott had the lowest In the five counties. The census data show that jobs in manufacturing and retail are large in absolute numbers. Agriculture as well as the other service industries is also very significant. Direct employment on farms actually declined by 8% between 1991 and 1996 (from 6460 employees to 5955). This compared to a 6% decline in this sector in Ontario as a whole. This is consistent with declines that have occurred in this sector in PRSD&G since 1971. Despite this overall decline in other locations, employment on farms increased in Prescott county from 1545 to 1685 employees between 1991 and 1996.

Farm gates sales in the region increased from \$338 million to \$364 million between 1991 and 1996, while farm employment declined. The number of farms also declined, suggesting larger and more capital intensive farms. The farm gate sales increases during the five-year period were greatest in Dundas and Prescott counties exceeding 10%. Farm gate sales increased in all counties except Russell. PRSD&G has a higher level of farm gate sales than any of the provinces in Atlantic Canada.

The region had 5.5% of the cultivated land area in the province and produced 4.6% of the value of farm gate sales in 1996. The data on farm size suggest that the farms are on average larger in PRSD&G than in Ontario. In large part, smaller more capital intensive market garden, horticulture and fruit operations are absent in the region.

With respect to type of farm operation, the region is a concentrated dairy area with 1229 dairy farms in the region, or 14.8 % of dairy farms in Ontario. This concentration on dairy leads to a lower percentage of other farm types.

The second part of the work involved a survey of businesses that buy from and sell to agriculture (hereafter referred to as ag related businesses). The purpose of this survey was to estimate the value of sales related to agriculture and the number of jobs created by ag. related businesses.

We estimate that there are 1117 businesses beyond the farm gate related to agriculture. The sample survey of 303 businesses, completed in the summer of 1998, produced an estimate of 4516 jobs in the five counties in ag related businesses. This

refers to the jobs that are supported by farmers and is in addition to the 5955 jobs (1996) on the farm. In addition, from other secondary sources we estimated that 7414 jobs in the service sector were supported by the direct and indirect agricultural jobs. With respect to sales, we estimate that the \$364 million in farm gate sales produced \$756 million in ag related sales.

Other selected data indicate that there is a very low level of exports from the region. Only 9% of ag related sales for businesses in the area were to markets outside the five counties. There appears to be a significant opportunity here which is not currently being exploited. The largest ag related business category is wholesale, followed by construction and retail. Specialty agricultural services such as veterinary sciences were also well represented as linked industries. Other typical businesses included in the study were construction, livestock transportation, manure handling equipment, truck sales, insurance and auctioneers. The average number of employees in the businesses surveyed was 11, and more than 50% of businesses had less than five employees. The great majority of these businesses are small businesses.

There are significant opportunities for value added processing and manufacturing related to Agriculture in the area and all involved should take action to promote these activities. As on farm jobs decrease there is a strong likelihood that they will be replaced with ag. related jobs off the farm. Planners, policy makers and business people have an important role to play in making this happen.

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Thank you very much. Sincerely,
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Table of Contents

Acknowledgments	-i-
Table of Contents	-ii-
1.0 Introduction	-1-
1.1 Background to the Research Report	-1-
1.2 Introduction to the PRSD&G Research	-2-
2.0 Profile of the Economies of Prescott, Russell, Stormont, Dundas and Glengarry	-3-
2.1 Employment Changes in Eastern Ontario	-3-
Chart 1: Employment by Industrial Sector for PRSD&G Counties, 1991 & 1996	-4-
Table 1: Employment by Industrial Sector for PRSD&G Counties and Ontario, with Percentage Changes, 1991 & 1996.	-5-
Table 2: Employment by Industrial Sector by County, 1991 & 1996. .	-6-
2.2 Family Income in PRSD&G.	-7-
Table 3: Employment in Primary, Manufacturing and Other Services, 1971, 1981, 1991 & 1996.	-9-
Chart 2: Percentages of family income classes in Prescott, Russell, Stormont, Dundas & Glengarry Counties, and Ontario ...	-10-
Table 4: Classes of family income in Prescott, Russell, Stormont, Dundas & Glengarry Counties and Ontario	-11-
2.3 Farm Gate Sales in PRSD&G Counties	-11-
Table 5: 1996 Farm gate sales by townships in PRSD&G Counties, and Ontario	-13-
Chart 3: Value of Farm Gate Sales: PRSD&G Counties Compared to Provinces 1996	-14-
Table 6: Farm gate sales for PRSD&G compared to provinces 1986, 1991 & 1996. (In \$ millions)	-14-
2.4 Agricultural Land Use, Area, Farm Size and Farm Products in PRSD&G. .	-14-
Table 7: Land Area Classified by Use, 1996 (in acres)	-15-
Table 8: Farms by size, 1996	-16-
2.5 Types of Farms in PRSD&G	-17-
Table 9: Farms by Major Products, 1996.	-18-
3.0 Economic Impact Analysis: An Overview	-19-
3.1 Input-Output Analysis	-19-

3.2 Economic Base Approach	-20-
3.3 Multipliers	-21-
4.0 PRSD&G Counties Study Methodology	-23-
4.1 Direct Impact Methodology	-23-
4.2 Indirect Impact Methodology	-24-
4.2.1 Development of the Business Inventory and Survey Sample	-24-
Table 10: Number of Ag-related businesses in PRSD&G Counties.	-25-
4.2.2 Verification of Sales and Employment Data through Long Interviews	-25-
4.2.3 Total Gross Sales for Businesses Surveyed	-26-
Table 11: Total Gross Sales of the Businesses Surveyed.	-26-
4.2.4 Agriculture-related Sales for the Businesses Surveyed	-27-
Table 12: Agriculture-related Sales of the Businesses Surveyed. . . .	-27-
Table 13: Total Agriculture and Non-Agriculture Sales of the Businesses Surveyed. . . .	-28-
4.2.5 Total Gross Sales for all PRSD&G Counties' Agriculture-Related Businesses	-29-
Table 14: Estimated Total Gross Sales for all Agriculture-related Businesses Using Sale Multipliers. . . .	-30-
4.2.6 Agriculture-Related Sales for all Agriculture-Related Businesses in PRSD&G Counties	-31-
Table 15: Estimated Agriculture-related Sales for all Agriculture-related Businesses Using Sale Multipliers. . . .	-31-
Table 16: Total Estimated Agriculture and Non-Agriculture Sales for all Agriculture-related Businesses. . . .	-32-
4.2.7 Number of Full-Time Equivalent Employees Working at the Businesses Surveyed	-32-
Table 17: Total and Agriculture-related FT Jobs at the Businesses Surveyed. . . .	-33-
4.2.8 Number of Full-Time Equivalent Employees Working in Agriculture Related Businesses in PRSD&G Counties	-33-
Table 18: Estimated Total and Agriculture-related FT Jobs Using Job Multipliers. . . .	-34-
4.3 Induced Impact Methodology	-34-
5.0 Results	-35-
5.1 Introduction to the PRSD&G Counties' Results	-35-
5.2 Direct, Indirect and Induced Impact Results	-36-
5.2.1 Estimated Direct Sales and Jobs	-36-

5.2.2	Estimated Indirect Sales and Jobs	-36-
Chart 4:	Response Rate by Business Type	-38-
Chart 5:	Percentage of Agriculture-related Sales According to Business Type,(for Businesses Surveyed	-44-
Chart 6:	Average Number of Employees by Business Type, for Businesses Surveyed.	-46-
Chart 7:	Location of Sales by Business Type, for Business Surveyed	-48-
Table 19:	Gross Sales Generated by all PRSD&G Agriculture-related Businesses	-49-
Table 20:	Full Time Equivalent Indirect Jobs in Agriculture	-49-
5.2.3	Estimated Induced Sales and Jobs	-49-
5.2.4	Total Direct, Indirect and Induced Impacts	-51-
5.3	In-depth Analysis of Agriculture-Related Businesses: Case Studies	-51-
6.0	Results Conclusions	-52-
	Bibliography	-54-
	Appendix 1. Questionnaire	-57-

1.0 Introduction

This report attempts to identify and measure the economic impact of agriculture on the Counties of Prescott, Russell, Stormont, Dundas and Glengarry (PRSD&G). It focuses on agriculture beyond the farm gate.-- the feed manufacturers, the veterinarians, the trucking companies and others. However, it also includes an analysis of primary agriculture itself. In the past, many studies of this type have restricted themselves to reports on conditions on the farm. By ignoring the size and importance of agriculture beyond the farm gate, the impact of agriculture in the local economy was under emphasized. This study hopes to set the record straight and present a more complete picture of the agricultural economy.

The basic focus of the report is on dollars and jobs. The main method used is based on input-output analysis. This approach depicts the economy as a series of sectors that buy and sell goods to each other until they reach the point of consumption. The purchases from another industry are the inputs and the sales to another industry are the outputs.

The research presented in the report relies on data from the Population Census, Agricultural census, surveys of Agriculture related businesses, and information from local citizens knowledgeable of the area. The report includes a discussion of the role of agriculture in the PRSD&G economy, and includes a discussion of related socioeconomic conditions.

1.1 Background to the Research Report

Over the past 50 years the number of people living on farms in Canada has declined. In many cases, the role of agriculture in the local economy was seen, by local politicians, to decline at the same rate as farm jobs declined. Other sectors were seen to replace agriculture. There was a growing feeling that jobs in the service sector and special

sectors like tourism were the jobs of the future. Many people argued for a strong push to find jobs in these sectors. However, most of the evidence came from the direct employment data and ignored the multiplier impact of agriculture in the total economy.

It is also worthwhile noting that although there were declines in the number of direct jobs in agriculture, the value of farm gate sales has continued to rise. Between 1986 and 1996, farm gate sales in Ontario rose from \$5,511 million to \$7,778 million (a growth rate of 3.5% per year) while employment on farms declined. Not only did the value of production increase, the volume of production also increased. This implies an increase in productivity of farm workers and more capital intensive farm operations.

1.2 Introduction to the PRSD&G Research

With issues around changes in the agricultural sector and the increasing role of other sectors of the economy, the representatives of Agriculture and others interested in jobs in agriculture in PRSD&G, expressed a desire to assess the total impact of agriculture beyond the farm gate. These people were aware of the work done in Huron County by the University of Guelph, (Cummings, Morris & McLennan, 1998) and also received copies of the Huron County report and a methodology guide on how to carry out this work in their region.

A working group, formed with representatives of County Federations of Agriculture, economic development departments of local municipalities, Human Resources Development Canada, and the Ontario Ministry of Agriculture Food and Rural Affairs, decided to commission a study of the role of agriculture in the economies of their five counties. Financial and in kind support was provided by all organizational partners.

The report which follows starts with a profile of the County economy, a description of the methodology used, a report on jobs and money generated by Agriculture in the economy and a summary, conclusions and recommendations.

2.0 Profile of the Economies of Prescott, Russell, Stormont, Dundas and Glengarry

2.1 Employment Changes in Eastern Ontario

During the period 1991 to 1996, employment in the five counties remained relatively stable. The 1991 census showed 88,110 employed while 88,125 (Table 1) were employed in 1996. The individual component counties ranged in employment from 10,840 employed in Dundas in 1996 to 31,370 employed in Stormont in 1991. The most significant gain in employment in the five counties in the last five years took place in Russell which grew from 18,605 employees in 1991 to 20,665 in 1996. The most significant decline took place in Stormont which declined from 31,370 in 1991 to 29,645 in 1996 (Table 2).

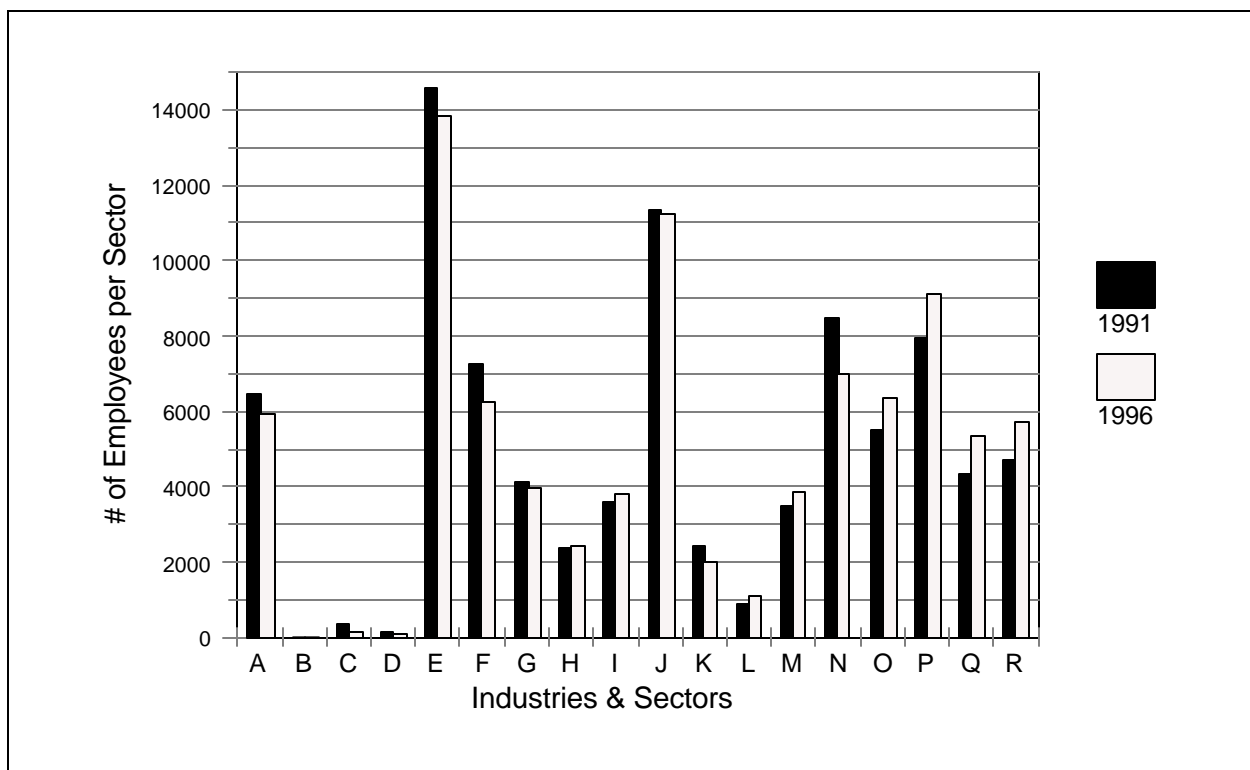
The data in Table 1 and Table 2, as well as the data in Chart 1 show the relative importance of the sectors of the economy where the residents are employed. The data here measures **direct** economic impact in that employment in agriculture indicated here is directly on the farm. In Chart 1, we see that sector E (manufacturing) has the largest employment followed by sector J (retail). In employment terms we would also describe manufacturing as a goods producing sector and retail as a service sector. Across Ontario and around the world, we see declining employment in the goods producing industries while the service industries continue to grow. Agriculture like manufacturing is a goods producing industry and saw employment decline by approximately 8% in the five counties from 6,460 employees to 5,955 employees between 1991 and 1996. This compared to a decline of 5% in manufacturing (Table 1). In general service sector industries grew during the period with specific exceptions— there were declines in employment in government services and real estate and insurance services across the five counties.

In general, in 1996 in the five counties together, there are 20,000 jobs in goods producing industries and the balance, or 68,000 in service industries. Table 2 shows the

pattern of growth and change in each of the five counties. Direct agriculture employment declined in all counties except Prescott. Coincidentally, Prescott also had the largest agricultural employment. There is some evidence to suggest that the more specialized agricultural areas are thriving, while smaller, less specialized agricultural employment regions decline (Cummings, Morris, McLennan 1998).

In manufacturing, we see that Stormont had the largest base with 5,650 employees in 1996, a decline from 6,415 in 1991. There was some growth (100 +/- jobs) in each of three counties— Dundas, Glengarry and Russell (Table 2).

Chart 1: Employment by Industrial Sector for PRSD&G Counties, 1991& 1996



Source: Statistics Canada 1991 and 1996.

Table 1: Employment by Industrial Sector for PRSD&G Counties and Ontario, with Percentage Changes, 1991 & 1996.

Industries and Sectors	PRSD&G Counties				Ontario			
	1991	1996	Total Change	% Change	1991	1996	Total Change	% Change
A. Agricultural and related service industries	6,460	5,955	-505	-8%	139,880	131,060	-8,820	-6
B. Fishing and trapping industries	0	10	10	N/A	1,965	1,915	-50	-3
C. Logging and forestry industries	345	160	-185	-54%	13,965	11,405	-2,560	-18
D. Mining (including milling), quarrying and oil well industries	175	90	-85	-49%	34,355	26,050	-8,305	-24
E. Manufacturing industries	14555	13855	-700	-5%	942,995	922,565	-20,430	-2
F. Construction industries	7230	6225	-1005	-14%	358,890	290,430	-68,460	-19
G. Transportation and storage industries	4135	3955	-180	-4%	187,830	198,555	10,725	6
H. Communication and other utility industries	2380	2420	40	2%	188,630	173,040	-15,590	-8
I. Wholesale trade industries	3620	3805	185	5%	233,915	278,220	44,305	19
J. Retail trade industries	11340	11220	-120	-1%	700,925	662,815	-38,110	-5
K. Finance and insurance industries	2430	1990	-440	-18%	253,135	228,880	-24,255	-10
L. Real estate operator and insurance agent industries	895	1130	235	26%	100,090	111,890	11,800	12
M. Business service industries	3500	3835	335	10%	367,200	411,070	43,870	12
N. Government service industries	8495	6980	-1515	-18%	411,450	304,640	-106,810	-26
O. Educational service industries	5535	6370	835	15%	365,235	369,320	4,085	1
P. Health and social service industries	7950	9095	1145	14%	457,115	513,615	56,500	12
Q. Accommodation, food and beverage service industries	4355	5370	1015	23%	322,955	350,945	27,990	9
R. Other service industries	4,690	5,735	1,045	22	355,310	414,980	59,670	17

TOTALS	88,110	88,225	115	0	5,435,850	5,401,395	-34,450	-1
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Source: Statistics Canada 1991 and 1996.

Table 2: Employment by Industrial Sector by County, 1991 & 1996.

Industrial Sectors	Stormont		Dundas		Glengarry		Prescott		Russell	
	1991	1996	1991	1996	1991	1996	1991	1996	1991	1996
A. Agricultural and related service industries	1,230	910	1,525	1,420	1,330	1,155	1,545	1,685	815	760
B. Fishing and trapping industries	0	0	0	0	0	0	0	0	0	0
C. Logging and forestry industries	230	75	10	30	30	10	60	10	0	15
D. Mining (including milling), quarrying and oil well industries	55	10	20	0	20	20	20	20	15	25
E. Manufacturing industries	6,415	5,650	1,755	1,855	2,020	2,120	3,240	3,060	1,115	1,160
F. Construction industries	2,280	2,025	850	780	830	605	1,265	975	1,995	1,800
G. Transportation and storage industries	1,300	1,140	600	510	780	800	525	615	920	885
H. Communication and other utility industries	940	665	240	330	175	210	250	355	770	850
I. Wholesale trade industries	1,160	1,060	560	495	475	540	715	700	710	990
J. Retail trade industries	4,265	4,105	1,230	1,185	1,325	1,340	2,045	2,020	2,485	2,560
K. Finance and insurance industries	695	605	230	190	255	200	350	340	880	655
L. Real estate operator and insurance agent industries	325	385	85	140	150	145	125	165	215	285
M. Business service industries	1,200	1,135	315	530	405	320	620	435	955	1,370
N. Government service industries	2,465	1,765	1,070	650	515	515	1,020	840	3,430	3,215
O. Educational service industries	1,935	2,120	515	620	665	745	1,150	1,210	1,260	1,660
P. Health and social service industries	3,150	3,495	905	995	1,075	1,055	1,315	1,310	1,480	2,215
Q. Accommodation, food and beverage service industries	2,025	2,500	410	470	540	580	775	930	585	870

R. Other service industries	1,670	2,000	550	640	700	725	800	995	940	1,340
TOTALS	31,370	29,645	10,915	10,840	11,315	11,085	15,885	15,665	18,605	20,655

Source: Statistics Canada 1991 and 1996.

While the previous tables showed changes over five years for 18 sectors, in Table 3, three more general sectors have been selected and changes in employment from 1971 to 1996 are identified. Totals are provided by county, for the five county region and the province. By looking at the table we can see that the primary sector of employment (96% of which is agriculture) has continuously declined in the region between 1971 and 1996. The rate of decline has been faster than the province. In manufacturing there was a significant growth in employment between 1971 and 1981 in both the region and the province. Since 1981, employment in manufacturing has declined at a similar rate between the region and the province. In the service sector, there has been strong growth in the province and region since 1971, with the rate of growth higher in the region.

2.2 Family Income in PRSD&G.

The description of the five counties would not be complete without an analysis of family income distribution for the five counties and Ontario. Table 4 provides the raw data on number of families by income class, while Chart 2 indicates the percentage distribution of income. Table 4 shows the distribution by class from the lowest class, under \$10,000 to the highest class, \$100,000 and over. Focusing on the extremes, the high income classes and the low income classes, is always a useful way to highlight the differences.

Examining the highest class, we see that 12.4% of Ontario families had incomes over \$100,000 per year when compared to the region as a whole where 7.2% of families had incomes greater than \$100,000. In fact, if we look at the four income categories from \$70,000 and up we see that in all cases, Ontario had higher incomes than the region. At the other end of the scale, except for the under \$10,000 category, the five counties had more people than the province in these lower income categories. When we look at the individual counties in the higher income categories (Chart 2) we see that Russell had the

highest incomes, in many classes, higher than the provincial average, while Prescott had the lowest levels of income per family.

If we seek to explain, the high levels of income in Russell we would note that rapid growth has taken place in the service industries in this county in the last five years. Of particular note are business services, educational services, health and social services, accommodation food and beverage, and other services. In the same service industries, Prescott had slow growth or a decline.

Table 3: Employment in Primary, Manufacturing and Other Services, 1971, 1981, 1991 & 1996.

	Primary Industries ¹				Manufacturing Industries				Other Service Industries			
	1971	1981	1991	1996	1971	1981	1991	1996	1971	1981	1991	1996
Stormont	1,480	1,260	1,515	995	6,710	7,890	6,415	5,620	765	1,455	1,670	2,000
Dundas	1,720	1,560	1,555	1,450	1,420	1,735	1,755	1,855	190	400	550	640
Glengarry	1,625	1,655	1,380	1,185	1,275	2,000	2,020	2,120	185	420	700	725
Prescott	1,760	1,755	1,625	1,715	1,915	3,960	3,240	3,060	215	470	800	995
Russell	880	995	830	800	340	670	1,115	1,160	135	590	940	1,340
Region	7,465	7,225	6,905	6,145	11,660	16,255	14,545	13,815	1,490	3,335	4,660	5,700
Region (% change)²		-3%	-4%	-11%		39%	-11%	-5%		124%	40%	22%
Ontario	180,350	201,825	190,165	170,430	819,335	1,055,565	942,995	922,565	187,010	380,495	355,310	414,980
Ontario (% change)³		12%	-6%	-10%		29%	-11%	-2%		103%	-7%	17%

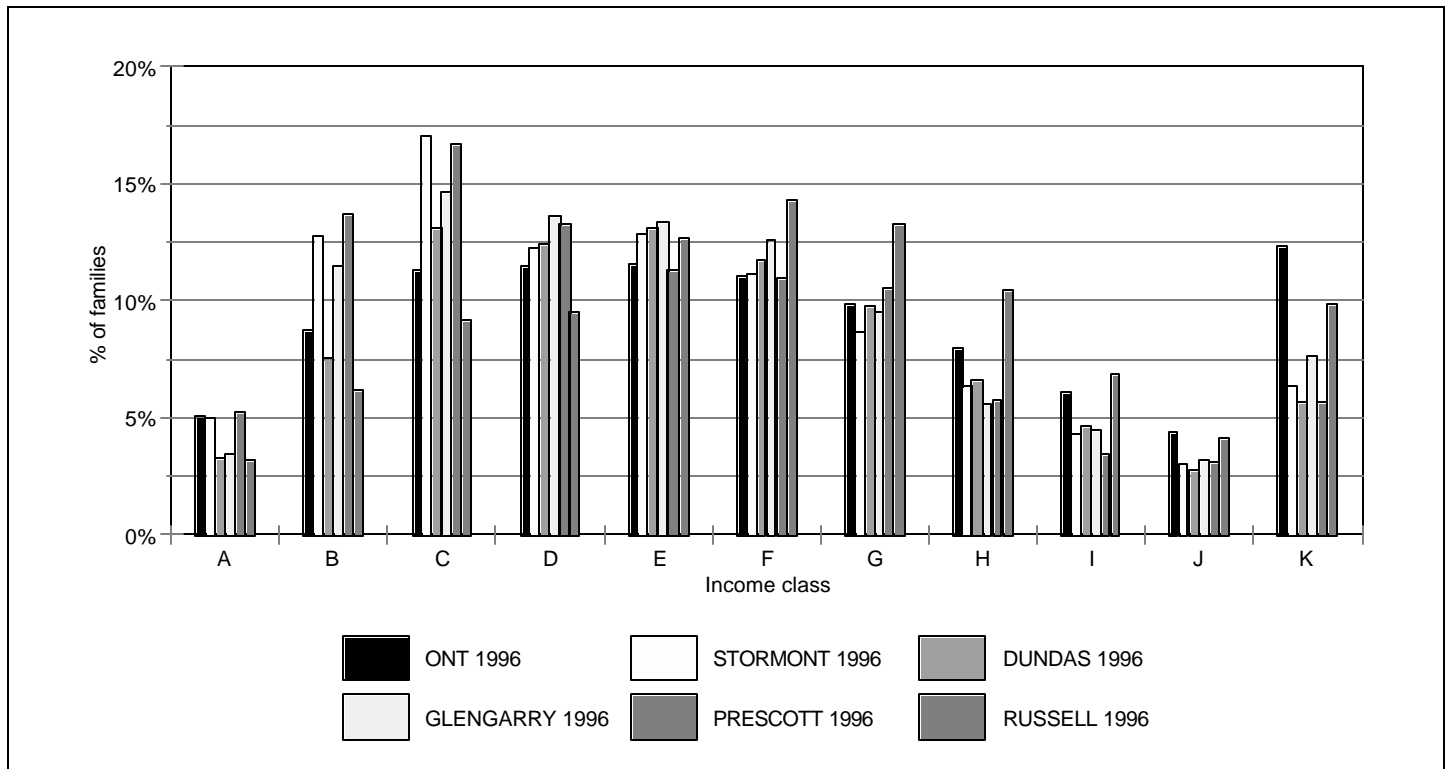
Source: Statistics Canada 1971, 1981, 1991 and 1996.

¹ Includes agriculture, forestry, fishing, trapping, mines, quarries and oil well industries.

² Indicates percentage change since previous time period.

³ Indicates percentage change since previous time period.

Chart 2.: Percentages of family income classes in Prescott, Russell, Stormont, Dundas & Glengarry Counties, and Ontario



Source: Statistics Canada 1996.

Table 4: Classes of family income in Prescott, Russell, Stormont, Dundas & Glengarry Counties and Ontario

Income Classes	Stormont	Dundas	Glengarry	Prescott	Russell	Region	(%)	Ontario	(%)
A. Under \$10,000	925	225	230	510	360	2,250	4.3%	148,050	5.05%
B. \$10,000 - \$19,999	2,350	525	770	1,335	695	5,675	10.9%	256,625	8.8%
C. \$20,000 - \$29,999	3,145	905	985	1,630	1,025	7,690	14.7%	332,130	11.3%
D. \$30,000 - \$39,999	2,265	860	915	1,300	1,065	6,405	12.2%	336,440	11.5%
E. \$40,000 - \$49,999	2,380	905	900	1,105	1,415	6,705	12.8%	340,330	11.6%
F. \$50,000 - \$59,999	2,060	815	845	1,070	1,600	6,390	12.2%	324,365	11.1%
G. \$60,000 - \$69,999	1,605	675	640	1,025	1,485	5,430	10.4%	289,155	9.9%
H. \$70,000 - \$79,999	1,180	460	375	560	1,165	3,740	7.2%	235,015	8.0%
I. \$80,000 - \$89,999	795	325	300	340	770	2,530	4.8%	179,905	6.1%
J. \$90,000 - \$99,999	565	190	215	305	460	1,735	3.3%	127,950	4.4%
K. \$100,000 and over	1,180	390	515	555	1,105	3,745	7.2%	362,765	12.4%
TOTAL	18,450	6,275	6,690	9,735	11,145	52,295	100.00%	2,932,730	100.0%

Source: Statistics Canada 1996. Totals may not add due to rounding

2.3 Farm Gate Sales in PRSD&G Counties

In the previous sections, the general characteristics of the economy of the five counties was described. In the following sections, some more particular aspects of the agricultural economy are noted.

In 1996, farm gate sales in the five counties totaled \$364.5 million. Prescott County was the largest in terms of sales with \$97 million, followed by Dundas with \$88 million. On a per farm basis, Prescott was also the largest with \$128,000 in sales per farm on average. This can be compared to Stormont with \$92,000 per farm. The Ontario average

is \$115,000. This shows that, on average, the value of sales per farm is lower in the region than in the province. At the county level, only Prescott has average farm gates sales higher than the Ontario average. The region had 4.7% of the provinces farm gate sales and 5.0% of the farms in 1996.

This data, when combined with the estimates of farm employment, presents a picture of a region with more farms and higher employment per farm and lower value of production per farm than in the Ontario case or the Huron County case (Cummings, Morris, McLennan; 1998) In terms of farm gates sales and employment, we find PRSD&G in 1996 with 5,955 farm workers producing \$364 million, when compared to Huron County with approximately 5,050 farm workers and \$512 million in sales in 1996. Agriculture in PRSD&G is currently more labour intensive than in the rest of the province.

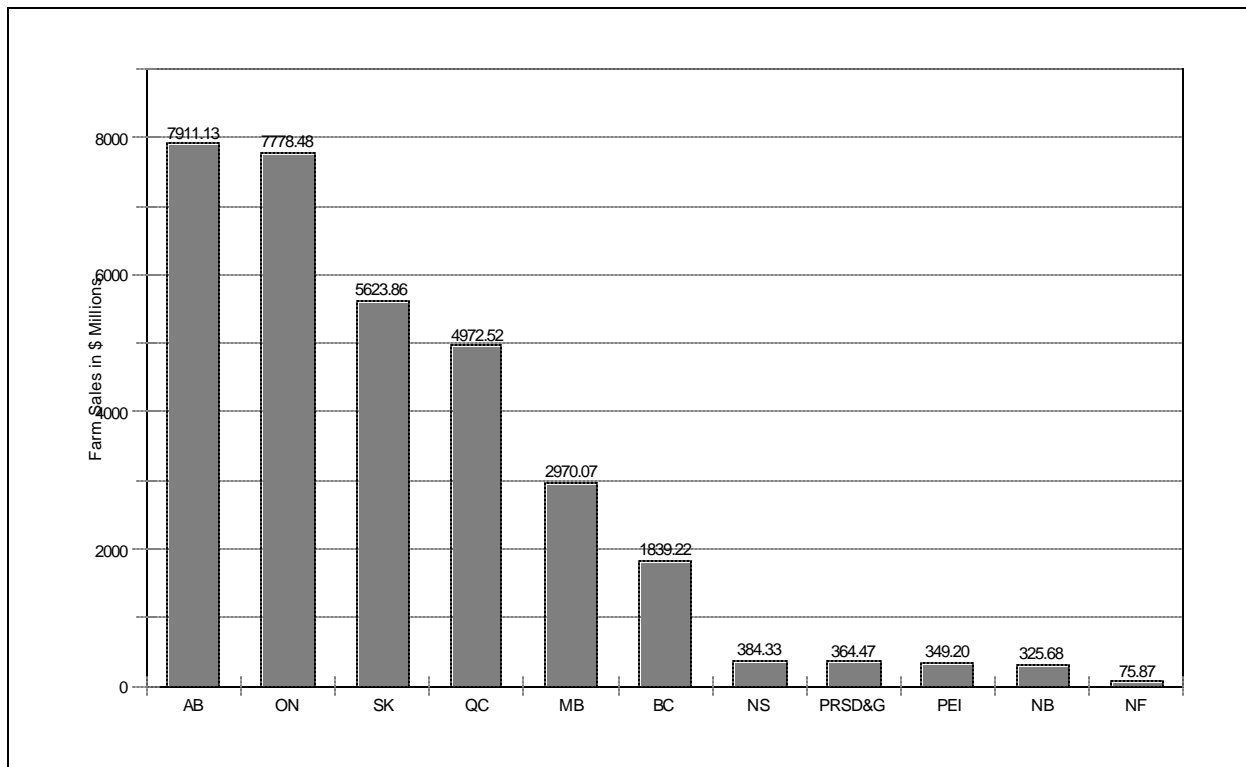
Table 5: 1996 Farm gate sales by townships in PRSD&G Counties, and Ontario

Area	# of Farms	Farm Gate Sales, 1996	Sales Per Farm 1996	# of farms	Farm Gate Sales 1990
Cornwall	100	\$5,600,987	\$56,010	93	\$5,830,631
Osnabruck	141	\$7,886,228	\$55,931	156	\$5,507,383
Finch	148	\$23,697,162	\$160,116	152	\$20,413,593
Roxborough	170	\$14,607,253	\$85,925	181	\$15,117,681
Stormont County	559	\$51,793,626	\$359,978	582	\$46,871,278
Williamsburgh	133	\$10,774,874	\$81,014	128	\$9,393,213
Matilda	186	\$22,605,933	\$121,537	193	\$19,008,336
Mountain	222	\$23,225,978	\$104,622	219	\$23,517,539
Winchester	240	\$31,507,692	\$131,282	264	\$27,040,893
Dundas County	781	\$88,114,477	\$438,455	804	\$78,959,981
Lancaster	168	\$25,752,667	\$153,290	188	\$21,473,201
Charlottenburgh	219	\$17,550,062	\$80,137	218	\$18,426,277
Kenyon	151	\$15,210,965	\$100,735	175	\$15,007,305
Lochiel	235	\$16,004,599	\$68,105	236	\$16,155,034
Glengarry	773	\$74,518,293	\$402,266	817	\$71,061,817
East Hawkesbury	164	\$18,650,287	\$113,721	175	\$17,339,796
West Hawkesbury	77	\$6,943,732	\$90,178	87	\$6,369,903
Caledonia	112	\$17,347,354	\$154,887	130	\$15,695,693
Longueuil	46	\$6,523,125	\$141,807	46	\$4,996,646
Alfred	114	\$12,658,980	\$111,044	122	\$11,548,095
South Plantagenet	135	\$23,085,297	\$171,002	150	\$22,575,407
North Plantagenet	111	\$12,436,001	\$112,036	108	\$8,979,144
Prescott County	759	\$97,644,776	\$894,676	818	\$87,504,684
Clarence	160	\$13,091,161	\$81,820	201	\$13,934,093
Cambridge	150	\$20,185,096	\$134,567	147	\$20,789,270
Russell	170	\$19,151,176	\$112,654	171	\$19,742,158
Russell County	480	\$52,427,433	\$329,041	519	\$54,465,521
Total for 5	3,352	\$364,498,605	\$2,424,4	3540	\$338,863,281
Ontario	67,520	\$7,778,476,483	\$115,203		
% of Ontario	5.0%	4.7%			

Source: OMAFRA, 1998.

Chart 3 and Table 6 portray PRSD&G in comparison to the provinces of Canada. The PRSD&G region is bigger than Newfoundland, Prince Edward Island, and New Brunswick in terms of farm gate sales making the region a very significant contributor to Canadian agriculture.

Chart 3: Value of Farm Gate Sales: PRSD&G Counties Compared to Provinces 1996



Source: OMAFRA 1996.

Table 6: Farm gate sales for PRSD&G compared to provinces 1986, 1991 & 1996. (In \$ millions)

	BC	AB	SK	MB	ON	PRS D&G	QC	NB	NS	PEI	NF
1986	1,059.0	4,473.9	3,938.2	2,035.2	5,511.7	249.7	3,028.9	222.7	271.4	197.9	46.2
1991	1,321.2	5,541.9	4,174.1	2,238.5	6,671.5	338.9	3,889.6	301.1	354.1	270.0	68.0
1996	1,839.2	7,911.1	5,623.9	2,970.1	7,778.5	364.5	4,972.5	325.7	384.3	349.2	75.9

Source: OMAFRA 1986, 1991 and 1996.

2. 4 Agricultural Land Use, Area, Farm Size and Farm Products in PRSD&G.

Table 7 shows the area of land under cultivation by type of use. PRSD&G has 5.5% of the agricultural land area of the province. The region is more concentrated on crops, with the region having 6.0% of the land area of the province under crops. The shares of other types of land use are presented in Table 7 below.

Table 8 shows the number of farms in each of the size categories used in the Agricultural Census in 1996 (Statistics Canada, 1996). This shows that PRSD&G has on average larger farms than the rest of the province. As examples, in PRSD&G, the most important size category is 240-399 acres, where 21% of the farms are. The next largest category in PRSD&G is 70 to 129 acres where there are 20% of the farms. In Ontario the largest category is 70 to 129 acres with 24% of farms, followed by 10 to 69 acres with 22% of farms.

Given that farms gates sales are on average larger in the province, the size data suggests that there are more smaller intensive farms producing high value crops in the province, when compared to PRSD&G.

Table 7: Land Area Classified by Use, 1996 (in acres)

	Under Crops	Summer Fallow	Improved Pasture	Unimproved Pasture	Other	Total
Stormont County	79,383	257	7,360	12,220	17,693	125,043
Dundas County	127,305	79	9,295	13,952	18,987	173,835
Glengarry County	112,646	313	10,645	18,528	30,781	178,644
Prescott County	133,421	0	14,249	18,949	3,371	195,287
Russell County	70,329	213	4,686	7,059	7,736	93,613
PRSD&G Counties	523,084	2,879	46,235	70,708	123,516	766,422
Ontario	8,759,707	48,492	860,786	1,641,692	2,568,888	13,879,565

PRSD&G Counties/Ontario (%)	6.0%	5.9%	5.4%	4.3%	4.8%	5.5%
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Source: OMAFRA, 1996.

Table 8: Farms by size, 1996

	Farm Size (in acres)														Total
	<10	10	70	130	180	240	400	560	760	1120	1600	2240	2880	>3520	
		-	-	-	-	-	-	-	-	-	-	-	-	-	
		69	129	179	239	399	559	759	1119	1599	2239	2879	3519		
Stormont	27	78	99	60	87	129	53	16	7	2	0	0	1	0	559
% of Farms	5%	14%	18%	11%	16%	23%	9%	3%	1%	0%	0%	0%	0%	0%	100%
Dundas	33	143	160	80	92	167	58	23	13	8	2	2	0	0	781
% of Farms	4%	18%	20%	10%	12%	21%	7%	3%	2%	1%	0%	0%	0%	0%	100%
Glengarry	27	110	174	87	90	169	68	22	18	6	1	1	0	0	773
% of Farms	3%	14%	23%	11%	12%	22%	9%	3%	2%	1%	0%	0%	0%	0%	100%
Prescott	32	99	138	79	104	160	82	39	17	7	0	0	1	1	759
% of Farms	4%	13%	18%	10%	14%	21%	11%	5%	2%	1%	0%	0%	0%	0%	100%
Russell	16	108	103	53	53	91	35	12	7	2	0	0	0	0	480
% of Farms	3%	23%	21%	11%	11%	19%	7%	3%	1%	0%	0%	0%	0%	0%	100%
PRSD&G	135	538	674	359	426	716	296	112	62	25	3	3	2	1	3,352
% of PRSD&G Farms	4%	16%	20%	11%	13%	21%	9%	3%	2%	1%	0%	0%	0%	0%	100%
Ontario	4,133	14,553	16,120	7,566	7,123	9,504	4,022	2,082	1,450	90	219	79	37	42	67,520

% of Ontario Farms	6%	22%	24%	11%	11%	14%	6%	3%	2%	0%	0%	0%	0%	0%	100%
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Source: OMAFRA 1996.

2.5 Types of Farms in PRSD&G

Table 9 below shows the Farms in PRSD&G by major type of product produced in 1996. The major difference in between PRSD&G farms and Ontario farms is the focus on dairying in this region. Ontario has 14% of its farms in dairying, while PRSD&G has 42%. All other categories of production are represented in the region, but at a lower level because of the extreme focus on Dairying. An examination of the pattern by individual county shows that this concentration is remarkable in its spread equally throughout the region.

Table 9: Farms by Major Products, 1996.

	Dairy	Beef	Pigs	Poultry	Field Crops	Fruit & Veg.	Misc. Specialty	Livestock Combo.	Other Combo.	Total
Stormont	202	101	10	2	95	3	48	8	11	480
% of Farms	42%	21%	2%	0%	20%	1%	10%	2%	2%	100%
Dundas	296	92	7	5	174	12	63	18	14	681
% of Farms	43%	14%	1%	1%	26%	2%	9%	3%	2%	100%
Glengarry	257	136	9	17	141	17	72	5	17	671
% of Farms	38%	20%	1%	3%	21%	3%	11%	1%	3%	100%
Prescott	313	114	5	33	125	8	70	7	8	683
% of Farms	46%	17%	1%	5%	18%	1%	10%	1%	1%	100%
Russell	161	74	3	8	87	14	60	11	7	425
% of Farms	38%	17%	1%	2%	20%	3%	14%	3%	2%	100%
PRSD&G	1,229	517	34	65	622	54	313	49	57	2,940
% of PRSD&G Farms	42%	18%	1%	2%	21%	2%	11%	2%	2%	100%
Ontario	8,320	14,172	2,677	1,686	17,681	3,444	8,547	2,030	1,330	59,887
% of Ontario Farms	14%	24%	4%	3%	30%	6%	14%	3%	2%	100%

Source: OMAFRA 1996.

3.0 Economic Impact Analysis: An Overview

Economic impact analysis studies are aimed at identifying "... changes in a local economy resulting from a stimulus (positive or negative) to a particular segment of the economy" (Davis, 1990, p. 5). These studies are often based on one of the several standard methodologies of regional analysis; economic base analysis and input-output analysis (Faas, 1980, p. 4). Economic impact is generally a measure of the impact of a sector or a project on all sectors of the economy.

3.1 Input-Output Analysis

Input-Output (IO) analysis is used to measure the inter-relationships between economic activities at the sectoral, national and regional levels. Linkages are expressed by estimating the sales (outputs) from a given sector to all other sectors in the economy, and by estimating the inputs from all other sectors to a specific sector. What makes the I-O model so useful is the comprehensiveness of the model which disaggregates the economy into individual sectors (Josling, 1966, p. 5). Disaggregation permits analysis at the sectoral level, providing researchers with a close-up view of the economy. This analysis allows the researcher to assess where each sector purchases its inputs and sells its outputs. Such analysis is invaluable in identifying what investment will provide the greatest impact on an economy (Poole et al., 1994, p. 30).

The I-O model estimates the movement of expenditures through the economy. This is traced through four different levels of expenditure: intermediate and primary suppliers, and intermediate and primary purchasers (Bendavid-Val, 1991, p. 88). Suppliers - intermediate and primary - purchase inputs for processing into outputs. Purchasers - intermediate and primary - buy outputs from suppliers and either use them to manufacture a product, or sell them as a final product (Bendavid-Val, 1991, p. 88).

Input-output analysis has two main approaches. One allows the estimation of only the direct and indirect effects of a sector. The other estimates these, as well as the induced effects of a sector. The open model is used to trace the flow of variables between sectors of the economy (i.e., direct and indirect expenditures). The open model does not

measure induced spending in the economy; meaning expenditures by employees on food, services and other household expenses (Davis, 1990, p. 59). The closed model is used to measure all aspects of the economy; including the direct, indirect and induced effects. Treating the household sector as a producer that sells labour to other purchasing sectors assesses induced effects (Davis, 1990, p. 59).

There are several problems associated with the I-O model. The first is that it is time-specific. In other words, it takes a snapshot of the economy in time. This model cannot account for changes in product demand or input costs, or for the introduction of new technology into the industrial sector (Davis, 1990, p. 62). Thus, the I-O model does not adjust for the changing nature of the economy. A second problem of the I-O model is the cost and time needed for the construction of the tables associated with this analysis. For this reason, the analysis for this study has been carried out using a survey-based "input-output-like" approach.

3.2 Economic Base Approach

Economic base theory maintains that economic growth is only possible if the economy's exports grow (Bradfield, 1988, p. 38). The theory is based on the belief that as exporting industries expand their sales, there will be an increasing demand for inputs locally which will consequently drive local economic growth (Bradfield, 1988, p.39). In economic base theory, the economy is classified into two sectors of basic and non-basic. The basic sector includes industries that ultimately export their product out of the region. The non-basic sector is the economic activity with final sales remaining inside the region (Davis, 1990, p.10). These are support industries that provide everything from industrial inputs to houses for basic sector employees (Higgins and Savoie, 1995, p. 66). The exporting industries are identified as basic sectors while all other industries are classified as non-basic.

According to economic base theory, exports are the engine of the local economy. It follows, then, that the export of goods supports all other aspects of the economy (Bendavid-Val, p.77). Economic base theory and its supporters carry the separation of

basic and non-basic sectors to the point where they attempt to predict the relative impact of the basic sector on the non-basic sector. The prediction of economic impact is assessed through two economic indicators known as the economic base ratio and economic base multiplier. Economic base theory has been refined to the point where it can be questioned: "[W]hat is the overall gain in employment or income in the region associated with each gain in export sales?" (Bendavid-Val, 1991, p.78).

This question is answered through the economic base ratio indicator and the base multiplier indicator (Bendavid-Val, 1991, p.78). The economic base ratio calculates jobs that are theoretically created from one additional job in the basic sector. The economic base ratio is the ratio between employment in the basic and non-basic sectors and is supported by the idea of basic employment and non-basic employment combined equaling total employment (Bendavid-Val, p.78). The economic base multiplier is the ratio of total employment to basic employment and indicates how many jobs in total are provided for each basic job. Thus, the economic base multiplier is the total sum of the jobs created in both sectors from one job in the basic sector (Bendavid-Val, p.78). The economic base method is used in this study to estimate jobs in the service sector related to agriculture.

3.3 Multipliers

Given the previous discussion of input-output analysis and economic base analysis, the reader may question where the application of the two models leads. One of the best uses is that they allow the analyst to identify the impacts of economic changes or shocks to a system. Essentially, what these models do is measure the multiplier effects that result from a change in an economic system. In basic terms, multiplier effects are the summation of the direct, indirect and induced impacts of economic activity presented in a single number (Lewis et al., 1979, p. 1).

Therefore, an economic multiplier can be used to estimate the impact of change in one variable (for example, the value of agricultural production) on another variable (for example, the value of non-agriculture production). Direct employment and production in

the agriculture sector will affect the rest of the economy by supporting employment in related industries as well as in the retail sector. In this way, "...a multiplication of transactions occurs in the economy by people re-spending money" (Van Hove, 1995, p. 66).

The multipliers calculated for this research include a sales expenditure multiplier and an employment multiplier.

4.0 PRSD&G Counties Study Methodology

Initial research for the PRSD&G Counties study was carried out from July to December 1998. The economic impact of agriculture in the five counties was measured through an accounting of the total sales and employment of agriculture and related businesses in the study area. This work involved a review of the primary data from Statistics Canada's 1996 Population Census of Canada and 1996 Agricultural Census to study the direct economic impacts of agriculture on the economy of the five-county area. A survey-based 'input-output-like' approach was used to measure the indirect impacts. The survey was aimed at businesses that sell products to or buy from the agricultural sector. The induced economic and employment impacts of the agriculture sector were also studied using primary data derived from the Statistics Canada Census data.

Further work is being carried out to verify the data collected during the July-December period. Modifications will likely be made to the initial analyses presented in this report based on long interviews with selected businesses that were surveyed between July and December. A more in-depth look at the linkages between agriculture and the rest of the economy will also be completed.

4.1 *Direct Impact Methodology*

Data was taken from the 1996 Population Census of Canada and the 1996 Agricultural Census and yielded information on the economy of the five counties, individually and as a whole, including general labour trends and population data. Where appropriate, data from earlier censuses were incorporated to examine long-term trends in employment and sales in the five counties.

4.2 Indirect Impact Methodology

The research method used to measure the indirect impacts was a survey-based 'input-output-like' approach. This was completed through a telephone survey conducted from August to December 1998. The method was originally developed for use in a similar survey in Huron County in 1996 (Cummings, Morris and McLennan, 1998); the survey format was modified and translated in to French to suit the bilingual needs of the PRSD&G area. The method was designed to identify the value of gross sales and the jobs produced by a sample of businesses related to agriculture. From this sample, an estimate was produced for the total population of agriculture-related businesses in the PRSD&G Counties area. This in turn provided an estimate of the economic impact of these agriculture-related businesses in the area through indirect employment and sales.

Here, related to agriculture includes only those businesses that buy from or sell to the farm business; sales to farm families for personal consumption are excluded from the indirect impact but are included later as 'induced' impacts.

4.2.1 Development of the Business Inventory and Survey Sample

The survey was based on a random sample of local businesses. A list of agriculture-related businesses was developed by collecting lists from a number of sources in the area: Municipal Offices, Chambers of Commerce, Economic Development Offices, Ontario Federation of Agriculture County Representatives and the Yellow Pages. The original list of 1509 businesses was pared down to 1438 by verification of the existence of the businesses, checks for double-counting, and elimination of businesses that likely had no connection to agriculture (e.g. beauty salons). In order to attain a 5% confidence level for the 1438 businesses in the inventory, a sample size of 300 businesses was selected at random from the overall inventory. As a result of the first 300 surveys, it was determined that 21% of the businesses in the five county inventory as a whole had no ties to agriculture, and the inventory had to be further adjusted. Accounting for disparity between the five counties, a new estimate for agriculture-related businesses was developed, as well as for each individual county. The revised estimate for agriculture-related businesses in

PRSD&G counties in 1117, and is illustrated along with estimates for these businesses in each of the five counties as well as how these estimates were derived in Table 10.

Table 10: Number of Ag-related businesses in PRSD&G Counties.

County	# in orig. inv.	# in 1 st 300	Non-ag 1 st	% Non-ag	- Non-ag.	# in rev. inv.
Prescott	336	65	19	29.2%	98	238
Russell	437	85	20	23.5%	103	334
Stormont	219	37	13	35.1%	77	142
Dundas	229	60	6	10.0%	23	206
Glengarry	217	53	5	9.4%	20	197
TOTAL	1438	300	63	21.0%	321	1117

Source: 1998 Ag-business Survey

During the course of the telephone survey, respondents were asked to provide information regarding the total value of sales and employment figures for their business. They were also asked to estimate the percentage of sales related to the agriculture sector. Of the 303 businesses surveyed, 295 provided data on the value of sales and 302 provided employment data.

4.2.2 Verification of Sales and Employment Data through Long Interviews

Further analysis will be conducted in 1999 on the accuracy of the sales and employment data collected in 1998. Intensive interviews will be conducted with as many as twelve owners of agriculture-related businesses who responded to the 1998 phone survey. During the interview the respondents will be asked to divulge their business' total gross sales, the percentage of these sales associated with agriculture, and the number of employees for the year under study (1998). These numbers will be compared to the original data set collected during the 1998 telephone survey. Findings from previous studies have found that initial sales and employment data from the phone interviews tended to be underestimated (Cummings et al, 1998). Follow-up interviews will provide estimates of the percentage accuracy of the original estimates and provide for a revised estimate. All totals collected from the initial 1998 telephone survey will then be adjusted accordingly.

4.2.3 Total Gross Sales for Businesses Surveyed

Total gross sales for the businesses surveyed include sales related and unrelated to the agriculture sector. The sample included agriculture-related businesses that sell to and buy products from agriculture, but they may also sell to, and buy from other sectors of the economy. Table 11 illustrates the total gross sales for the businesses surveyed in 1998.

Table 11: Total Gross Sales of the Businesses Surveyed.

County	Number of businesses with sales data	Total gross sales
Prescott	58	\$94,871,500
Russell	79	\$114,560,500
Stormont	46	\$105,190,500
Dundas	52	\$66,832,000
Glengarry	60	\$92,117,500
TOTAL	295	\$473,572,000

Source: 1998 Ag-business Survey

It should also be noted that total gross sales are divided by the location of these sales. The businesses in the sample generate sales i) inside PRSD&G Counties, ii) outside PRSD&G Counties, but in Ontario, iii) outside Ontario, but in Canada, and iv) outside Canada. The figures below reflect these divisions. Again, it is important to note that these numbers will likely be adjusted using a multiplier after the long interviews have been conducted.

The initial 1998 estimate for total gross sales remaining inside the five-county area is 91.6% of the total gross sales, or \$433,654,413 for the 295 businesses surveyed that provided sales data. The initial 1998 estimate for total gross sales generated outside of PRSD&G Counties, but in Ontario, is 5.8% of the total gross sales, or \$27,437,480 for the 295 businesses surveyed that provided sales data. The initial 1998 estimate for total gross sales generated outside of Ontario, but in Canada, is 1.5% of the total gross sales, or \$6,962,915 for the 295 businesses surveyed that provided sales data. Finally, the initial 1998 estimate for total gross sales generated outside of Canada is 1.2% of the total gross sales, or \$5,517,192 for the 295 businesses surveyed that provided sales data. These

figures are presented in Table 13.

4.2.4 Agriculture-related Sales for the Businesses Surveyed

As part of the telephone survey, respondents were asked to estimate the percentage of their sales that were related to agriculture, either by providing products and/or services to farm businesses, or by purchasing products of agricultural origin. Table 12 illustrates the agriculture-related sales of the businesses surveyed for each of the five counties, as well as the study area as a whole, using the total gross sales of the businesses multiplied by the percentage of those sales that were related to agriculture.

Table 12. Agriculture-related Sales of the Businesses Surveyed.

County	Total Sales	% Ag-related Sales	Ag-related Sales
Prescott	\$94,871,500	40.5%	\$38,389,363
Russell	\$114,560,500	57.1%	\$65,459,278
Stormont	\$105,190,500	21.8%	\$22,949,240
Dundas	\$66,832,000	59.8%	\$39,934,190
Glengarry	\$92,117,500	35.7%	\$32,859,900
TOTAL	\$473,572,000	42.1%	\$199,591,971

Source: 1998 Ag-business Survey

Agriculture-related businesses in PRSD&G Counties have sales both related and unrelated to agriculture. By separating the agriculture-related sales from sales unrelated to agriculture and using the same percentages for sales as in Section 4.2.3, and , we are able to estimate both types of sales generated i) inside PRSD&G Counties, ii) outside PRSD&G Counties, but in Ontario, iii) outside Ontario, but in Canada, and iv) outside Canada. The figures below reflect these divisions. Once again, these numbers will likely be adjusted using a multiplier after the long interviews have been conducted.

The initial 1998 estimate for agriculture-related sales remaining inside the five-county area is \$182,768,277 for the 295 businesses surveyed that provided sales data. The initial 1998 estimate for agriculture-related sales generated outside of PRSD&G Counties, but in Ontario, is \$11,563,819 for the 295 businesses surveyed that provided

sales data. The initial 1998 estimate for agriculture-related sales generated outside of Ontario, but in Canada, is \$2,934,595 for the 295 businesses surveyed that provided sales data. Finally, the initial 1998 estimate for agriculture-related sales generated outside of Canada is \$2,325,279 for the 295 businesses surveyed that provided sales data. Table 13 summarizes the total agriculture-related and non-agriculture sales of the 295 businesses surveyed that provided sales data by sales-generating location category.

Table 13. Total Agriculture and Non-Agriculture Sales of the Businesses Surveyed.

Sales for Surveyed Agriculture-Related Businesses n=295	Agriculture-related Sales	Sales Unrelated to Agriculture	Total Sales for the Businesses Surveyed
Sales in PRSD&G	\$182,768,277	\$250,886,136	\$433,654,413
Sales in other Ontario Counties	\$11,563,819	\$15,873,661	\$27,437,480
Sales outside Ontario	\$2,934,595	\$4,028,320	\$6,962,915
Sales outside Canada	\$2,325,279	\$3,191,913	\$5,517,192
Total	\$199,591,970	\$273,980,030	\$473,572,000

Source: 1998 Ag-business Survey

4.2.5 Total Gross Sales for all PRSD&G Counties' Agriculture-Related Businesses

From the sample, estimates can be made regarding the total gross sales of all agriculture-related businesses in PRSD&G counties. These include sales both related and unrelated to agriculture. We have already found that there are approximately 1117 agriculture-related businesses in the five counties; a total of 295 of these businesses surveyed provided sales data. This is approximately a 26 percent sample. Therefore, a sampling multiplier of 3.79 can be used to calculate the total gross sales of all the agriculture-related businesses in the five counties as a whole. Multipliers have also been calculated for each of the five counties individually.

Table 14 illustrates the estimated total gross sales for all agriculture-related businesses in each of the counties, as well as for the study area as a whole, using the

multipliers devised for each. These estimates were derived by applying the relevant sample multipliers to the total gross sales of the 295 businesses which provided sales data. This not only allows us to determine the total gross sales within each county, but also to determine the nature of the overall sample in representing each of the counties. As shown in Table 14, Prescott and Russell Counties are under-represented in the overall sample as their multipliers are higher than that of the overall study area sample (4.10 and 4.23 > 3.79). Dundas County is slightly under-represented (3.96 > 3.79); Stormont and Glengarry Counties are somewhat over-represented (3.79 > 3.09 and 3.28).

Table 14: Estimated Total Gross Sales for all Agriculture-related Businesses Using Sale Multipliers.

County	Total Sales for Businesses Surveyed	Sales Multiplier	Total Estimated Sales
Prescott	\$94,871,500	4.1	\$388,973,150
Russell	\$114,560,500	4.23	\$484,590,915
Stormont	\$105,190,500	3.09	\$325,038,645
Dundas	\$66,832,000	3.96	\$264,654,720
Glengarry	\$92,117,500	3.28	\$302,145,400
TOTAL	\$473,572,000	3.79	\$1,794,837,880

Source: 1998 Ag-business Survey

These discrepancies are largely due to the varying number of businesses to choose from in each county in the business inventory, and the nature of selecting these businesses at random. However, these discrepancies have no bearing on the overall effectiveness of the sample.

It should be noted that sales data from financial institutions, such as banks and credit unions, were collected somewhat differently. Typically, their sales would be based on profits generated from loans and services provided to farm businesses. However, this information is difficult to obtain. Therefore, for the purposes of this study, 'sales' by financial institutions were based on the number of employees at the institution multiplied by an average salary of \$40,000. Total sales were then calculated by multiplying the number of employees at the financial institution by the average salary.

Taking the figures from the sampled businesses and using the multiplier of 3.79, we can estimate that PRSD&G's agriculture-related businesses generated \$1,794,837,880 in total gross sales. Of this, \$1,643,550,225 in total gross sales were generated within the PRSD&G area. The total gross sales generated outside PRSD&G, but inside of Ontario, is \$103,988,049. The total gross sales generated outside of Ontario, but still in Canada is \$26,389,448. Finally, the total gross sales generated outside of Canada is \$20,910,158. These figures are presented in Table 16.

4.2.6 Agriculture-Related Sales for all Agriculture-Related Businesses in PRSD&G Counties.

Total agricultural sales for PRSD&G Counties can be derived using estimates of the agriculture-related sales generated by the businesses surveyed. Using the same multipliers, estimates can be made for the agriculture-related sales of all agriculture-related businesses in each of the five counties as well as the five-county study area as a whole. Table 15 illustrates these estimates, which were derived by applying the relevant multipliers to the ag-related sales of the 295 businesses which provided sales data.

Table 15: Estimated Agriculture-related Sales for all Agriculture-related Businesses Using Sale Multipliers.

County	Ag-related Sales for Businesses Surveyed	Sales Multiplier	Estimated Ag-related Sales
Prescott	\$38,389,363	4.1	\$157,396,386
Russell	\$65,459,278	4.23	\$276,892,744
Stormont	\$22,949,240	3.09	\$70,913,152
Dundas	\$39,934,190	3.96	\$158,139,391
Glengarry	\$32,859,900	3.28	\$107,780,472
TOTAL	\$199,591,971	3.79	\$756,453,565

Source: 1998 Ag-business Survey

Individually, the issue of over-representation in the sample size may affect estimates for the individual counties. However, this has no effect on the study area as a whole. In total, PRSD&G agriculture-related businesses generate an estimated \$756,453,565 in

agriculture-related sales. Of this, \$692,691,770 in agriculture-related sales were generated within the PRSD&G area. The total gross sales generated outside PRSD&G, but inside of Ontario, is \$43,826,872. The total gross sales generated outside of Ontario, but still in Canada is \$11,122,114. Finally, the total gross sales generated outside of Canada is \$8,812,809. These figures are presented in Table 16.

Table 16. Total Estimated Agriculture and Non-Agriculture Sales for all Agriculture-related Businesses.

Sales for All Agriculture-Related Businesses n=1117	Agriculture-related Sales	Sales Unrelated to Agriculture	Total Sales for all Businesses
Sales in PRSD&G	\$692,691,770	\$950,858,455	\$1,643,550,225
Sales in other Ontario Counties	\$43,826,872	\$60,161,177	\$103,988,049
Sales outside Ontario	\$11,122,114	\$15,267,334	\$26,389,448
Sales outside Canada	\$8,812,809	\$12,097,349	\$20,910,158
Total	\$756,453,565	\$1,038,384,315	\$1,794,837,880

Source: 1998 Ag-business Survey

4.2.7 Number of Full-Time Equivalent Employees Working at the Businesses Surveyed

The study separated employees at the agriculture-related businesses into two categories. The first are employees who work on activities related to the agriculture sector. There are also employees who work at agriculture-related businesses, but do not serve the agriculture sector. For example, a veterinary office may have four veterinarians specializing in large animals (agriculture-related employees) and one veterinarian specializing in house pets (unrelated to the agriculture sector). Data on both types of employees were collected in the study, and organized to reflect the total Full Time Equivalent (FT) number of jobs at that business based on a 1,875 hours per year workload (7.5 hours a day/5 days a week/50 weeks a year).

In total, 302 of the businesses surveyed provided employment data. The initial 1998 estimate for the total number of FT jobs at the businesses surveyed is 3362.27. This total includes all employees of the businesses surveyed, regardless of whether or not they perform activities related to the agriculture sector. For the businesses surveyed, 36.3

percent, or 1220.70 FT jobs were related to agriculture. Table 17 summarizes the total and agriculture-related FT jobs at the businesses surveyed for each of the five counties, as well as PRSD&G as a whole. Note that these figures may be adjusted pending the outcome of the long interviews with selected respondents.

Table 17: Total and Agriculture-related FT Jobs at the Businesses Surveyed.

County	# with job data	Total FT Job Equiv.	% Ag-related Jobs	Ag-related FT Job Equiv.
Prescott	59	768.13	39.0%	299.60
Russell	79	781.38	47.0%	367.47
Stormont	48	763.89	22.1%	168.81
Dundas	56	403.62	53.0%	213.90
Glengarry	60	645.25	26.5%	170.92
TOTAL	302	3362.27	36.3%	1220.70

Source: 1998 Ag-business Survey

The survey also illustrated that there are jobs generated outside the study area by PRSD&G agriculture-related businesses. The total number of FT jobs outside of PRSD&G by the businesses surveyed is 283.41. Of these, 102.89 service the agriculture sector.

4.2.8 Number of Full-Time Equivalent Employees Working in Agriculture Related Businesses in PRSD&G Counties

The total number of FT jobs for all agriculture-related businesses, as well as the total FT jobs that serve the agriculture sector can be derived from the sample. The number of respondents who provided employment data (302) was divided into the estimate of the number of agriculture-related businesses in PRSD&G Counties (1117), resulting in a multiplier of 3.70. From these values, the total number of FT jobs for all agriculture-related businesses in PRSD&G Counties can be estimated at 12,440.42. Of these, the number of FT jobs serving the agriculture sector can be estimated at 4516.61. Table 18 illustrates the estimated total and agriculture-related FT jobs using multipliers derived for each county, as well as for PRSD&G as a whole.

Table 18: Estimated Total and Agriculture-related FT Jobs Using Job Multipliers.

County	Job Multiplier	Total Estimated FT Job Equivalents	Estimated Ag-related FT Job Equivalents
Prescott	4.03	3095.58	1207.40
Russell	4.23	3305.23	1554.40
Stormont	2.96	2261.13	499.68
Dundas	3.68	1485.31	787.16
Glengarry	3.28	2116.42	560.61
TOTAL	3.70	12440.42	4516.61

Source: 1998 Ag-business Survey

Again, by examining the individual county sample multipliers, we can see that Prescott and Russell Counties were both somewhat under-represented in the sample (4.03 and 4.23 > 3.70); Dundas County was well-represented (3.70 >= 3.68); and Stormont and Glengarry Counties were somewhat over-represented (3.70 > 2.96 and 3.28).

There are also jobs created outside of PRSD&G Counties by these businesses. The total number of FT jobs generated by these businesses outside of PRSD&G Counties is estimated at 1,048.6. Of these, 380.71 work on activities related to the agriculture sector.

4.3 Induced Impact Methodology

An examination of the induced effects of agriculture was conducted. Induced employment refers to service sector jobs supported by agriculture and agriculture-related employees. Prescott County was selected as the largest agricultural county (in terms of farm gate sales) to estimate the number of induced jobs. Then, 1996 employment data from the agriculture and manufacturing sectors were compared to service sector jobs in education, health and government services to estimate the number of induced jobs and sales for the PRSD&G area. More details and results on this are provided in section 5.2.3.

5.0 Results

5.1 *Introduction to the PRSD&G Counties' Results*

The aim of this chapter is to present the results of the study, including findings concerning the direct, indirect and induced impacts of agriculture and agriculture-related businesses on the economies of Prescott, Russell, Stormont, Dundas and Glengarry Counties. This chapter includes findings of an in-depth examination of the backward and forward linkages of agriculture-related businesses.

This research focuses on the economic impact of the agriculture sector and, more specifically, agriculture-related businesses in Prescott, Russell, Stormont, Dundas and Glengarry Counties. Both primary and secondary data collection were undertaken; the primary research collection was an 'input-output-like' survey approach of agriculture-related businesses in the five county area. This survey will be verified and supported by in-depth case studies with selected businesses who participated in the survey. Further calculations of the induced and direct impacts were completed, based on the Population Census of Canada data and, to some extent, on multipliers from previous studies (Cummings et al, 1998). The final analysis of the data illustrates that the agriculture sector continues to be very important to the economies of Prescott, Russell, Stormont, Dundas and Glengarry Counties.

The aim of the study was to identify the total economic impact of the agriculture sector in Prescott, Russell, Stormont, Dundas and Glengarry Counties. While published data present significant farm gate sales for the five county area, there was no evidence to prove the actual impact of the agriculture sector. Similarly, published data showed that direct employment in agriculture in 1996 continued on a downward trend. From this information, it was predicted that this decline would continue while employment in other sectors would grow. Given this trend and subsequent predictions, estimates of some aspects of the employment patterns in PRSD&G were made. Through a profile of PRSD&G, the direct impact of the agriculture sector was illustrated through the employment data for the area's economy, which illustrated growth and decline industries.

However, this did not provide the full story of the economic impact of agriculture to PRSD&G. To provide a clearer picture of the indirect economic impact of PRSD&G's agriculture sector, the input-output-like methodology was applied.

5.2 *Direct, Indirect and Induced Impact Results*

5.2.1 Estimated Direct Sales and Jobs

Direct impacts refer to the value of sales and number of jobs created by the agriculture sector in the five county area. Direct sales are equivalent to the value of farm gate sales. In PRSD&G, the value of farm gate sales was \$338.86 million in 1991. This figure increased 7.56 percent in 1996 to \$364.47 million, and represents 4.7 percent of Ontario's total farm gate sales. When the value of PRSD&G's direct sales is compared to Canada's ten provinces, it ranks 8th behind Nova Scotia and ahead of 3 provinces (Prince Edward Island, New Brunswick and Newfoundland) in value of gate sales produced.

In 1991 the agriculture sector contained 6,460 employees. This number includes farm owners, operators and labourers. In 1996, this number fell 8 percent to 5,955 employees.

5.2.2 Estimated Indirect Sales and Jobs

The indirect impacts of agriculture refer to the value of sales and number of jobs created by agriculture-related businesses in the five county area. An agriculture-related business is defined here as any business which sells to, or buys from, the agriculture sector. This study found that the value of indirect impacts created by these businesses is substantial.

5.2.2.1 Location of Agriculture-related Businesses in the Survey

Agriculture-related businesses are located in rural areas, villages, towns and cities in every township across the five county area. Greater representation is found in and around Cornwall, Embrun, Casselman, Rockland, St-Isidore, Alfred, L'Original and Hawkesbury. A limited number of agriculture-related businesses were found in Avonmore,

Finch, Vanleek Hill, Bourget, Clarence Creek and Limoges.

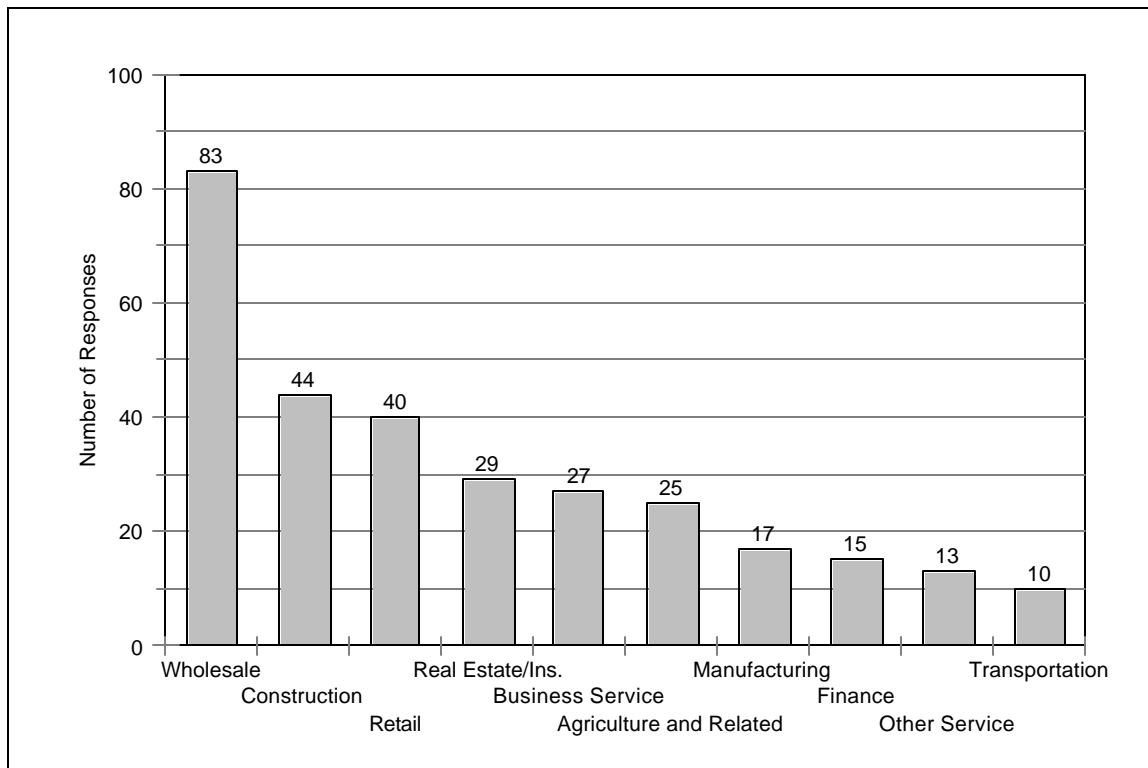
5.2.2.2 Characteristics of the Businesses Surveyed

The common characteristic with all of the businesses surveyed is that they deal in some way with the agricultural sector. More specifically, all of the businesses surveyed either sell products or services to, and/or buy products or services from agricultural producers. It is important to note that these agriculture-related businesses may also conduct trade with other sectors of the economy.

For the purposes of this study, the surveyed businesses were categorized according to their primary activity, using the Standard Industrial Code (SIC) categorization method developed by Statistics Canada. This system separates Canadian businesses into eighteen divisions or sectors, such as 'Manufacturing', 'Retail Trade' and 'Agriculture and Related Service Industries'.

During the Agriculture-related business survey, businesses from three industrial sectors (Education, Health and Government Services) were deliberately omitted from the survey as their impacts are being considered under induced impacts, leaving fifteen possible sectors with which PRSD&G's Agriculture-related businesses could form links. As illustrated in Chart 4, the study surveyed businesses in ten of the eighteen sectors.

Chart 4: Response Rate by Business Type



Source: 1998 Ag-business Survey

This suggests that the agriculture sector has links with almost every sector of the PRSD&G economy. Connections were found with the following sectors: Manufacturing, Construction, Transportation, Wholesale Trade, Retail Trade, Finance, Real Estate and Insurance, Business Services and Other Service Industries. Linkages were also found among businesses classified as Agriculture and Related Service Industries.

The survey did not include businesses from the following sectors: Fishing and Trapping, Logging and Forestry, Mining, Communications, and Accommodation, Food and Beverage Industries. This does not mean that these industries do not exist in PRSD&G, or even that they are not linked to agriculture as they may sell to or buy from agriculture directly, or may not have had enough local representation to be picked up by the survey sample.

Some of the industries analyzed in the study have comparatively stronger linkages with the agricultural sector. Of the total 303 businesses surveyed, high representation of agriculture-related businesses are found in Wholesale Trade (83 businesses surveyed), Construction (44), Retail Trade (40), Real Estate/Insurance (29) and Business Service Industries (27). Businesses within the agriculture sector are also making strong linkages

with other businesses within that sector (25 businesses surveyed). Characteristics of the businesses surveyed in various sectors of the PRSD&G economy are discussed below.

i) Agriculture and Related Service Industries

The study found that strong linkages exist between businesses within the agriculture sector in PRSD&G. Most often, services are provided to farms by these businesses in the forms of veterinary services, soil preparation, crop dusting, harvesting, baling and threshing. Highly specialized services such as egg grading and artificial cattle insemination are also linked to local agriculture. Linkages may also be provided by farms to these businesses through the sale of agricultural products such as manure, which can be used for plant nurseries. In total, 25 businesses from the agriculture and related industries sector were surveyed. A typical example is Martintown Animal Hospital, which specializes in veterinary services.

ii) Manufacturing Industries

A variety of products linked to the agriculture sector are produced by businesses in PRSD&G. In total 17 businesses from the manufacturing sector were surveyed as part of the study. A significant forward linkage involves the manufacturing of food products from agricultural goods. In PRSD&G, emphasis is placed on manufacturing/processing meat and poultry products. An example of one such local business is Neil's Butcher Blok, which specializes in custom meat processing. As described previously in this report, beef cattle make up a significant portion of local agriculture activity; as such it would seem logical that such emphasis is placed on the manufacturing of meat products in the area.

The most significant backward linkage to agriculture is the manufacture of agricultural implements and metal products by local businesses for use on farms. An example is Craig Rombough, who produces manure spreading systems.

iii) Construction Industries

The survey included 44 businesses from the construction industry, including businesses involved in well drilling, concrete pouring and finishing, plumbing, electrical, building and other heavy construction activities. One example of this type of business is PMC Contracting Services, which provides electrical contracting services.

iv) Transportation and Storage Industries

A total of 10 businesses from the transportation and storage sector were included in the survey. These businesses provide general freight, bulk liquids and dry material trucking. Typically, these would involve the transportation of livestock, dry and liquid manure and other fertilizers, and other agricultural products. One such example is McGinn's Livestock Trucking.

v) Wholesale Trade Industries

A number of wholesale dealers providing inputs to the agriculture sector exist in PRSD&G. Most of these businesses sell farm supplies to farms and equipment to farm equipment dealers. This includes general hardware, vehicle parts, farm machinery, construction equipment, auto wrecking services, food for livestock and agricultural chemicals. In some cases, wholesalers may sell equipment directly to the farm businesses, but this was not necessarily determined through the survey. A total of 83 businesses from the wholesale trade industries were surveyed. An example of a wholesale business in PRSD&G is Agrico Canada Limited, which provides wholesale fertilizer.

vi) Retail Trade Industries

Businesses included in the retail trade sector are primarily engaged in buying products for resale to the general public for personal or household consumption, and in providing related services such as installation and repair. The businesses also sell products to farmers for use in the farm business, but are classified as retail since their main activity is selling products for personal use, such as appliances, hardware stores and auto parts. The strongest backward linkages to the agriculture sector are automotive sales and service, which includes gas stations and garages. A weaker forward linkage is found in local grocery stores which purchase goods directly from local farms for sale to the public. In total, 40 retail trade businesses were included in the survey, an example of which is Grace Peter Auto Sales, which provides vehicle sales and service.

vii) Finance Industries

A total of 15 financial service businesses were included in the survey. These businesses include banks and credit unions, and provide loans and banking services to farm operations, and in many cases, local branches will have a department responsible for servicing them. An example of a finance industry business in PRSD&G is Caisse

Populaire Limoges.

viii) Real Estate and Insurance Industries

Real estate and insurance agencies provide important inputs to the agriculture sector. The main agriculture-related service provided by real estate is the selling of agricultural land. They are also involved in the leasing and brokerage of farm property and in providing written appraisals to farmers on demand. Insurance is also an important agricultural input. The survey included 29 real estate and insurance businesses, an example of which is Irving H. Miller Insurance, a provider of general insurance sales.

ix) Business Service Industries

Business service industries include such businesses as accountants and lawyers that provide financial and legal services to farm operations. The survey included 27 of these businesses, and example of which is Bartley and Associates, an accounting firm.

x) Other Service Industries

Other service industries can be broken down into four major groups (Statistics Canada, 1980). These are: Amusement and Recreational service industries such as theaters, sporting events, casinos and amusement parks; Personal and Household service industries such as beauty salons, laundry facilities, and funeral services; Membership Organization industries such as religious organizations, business organizations and professional membership associations; and Other Service industries which are the most relevant to agriculture as they include machinery and equipment rental and leasing, welding shops that repair farm machinery and equipment and auctioneers providing services for livestock owners. In total, 13 of these businesses were included in the survey. An example is Guy Bissonnette, an auctioneer.

5.2.2.3 Importance of the Agriculture-related Businesses Surveyed

This study measures the importance of a business through its total gross sales per year and through the number of full-time equivalent (FT) employees at the business. This provides an assessment of all the economic activities of the business, both related and unrelated to agriculture. For example, if a plumbing and heating business may serve both residential and agriculture-producing (ie. farm-business) customers. The total gross sales of this business would include both agriculture-related and unrelated sales.

a) Sales for Agriculture-Related Businesses Surveyed

All of the businesses surveyed had some sales related to the agriculture sector. During the survey, the owner of the business was asked to estimate the total gross sales for their business as well as the percentage of those sales that could be attributed to the agriculture sector. For example, if a business has \$500,000 in total gross sales per year, and the owner estimates that 50 percent of these sales are agriculture-related, then the total agriculture-related sales for that business would be \$250,000 ($\$500,000 \times 50\%$).

The importance of a business is also measured by the number of FT jobs at the businesses. This information was gathered for the business location surveyed, as well as for any other outlets of that business in other locations. An assumption of this study is that the percentage of sales related to agriculture is equivalent to the percentage of employees serving the agriculture sector for their business. For example, if the plumbing and heating business mentioned above employed 20 people, it would be assumed that 50% of these FT jobs (10), work on activities that service the agriculture sector.

Ninety-seven percent of the businesses surveyed provided sales data (295 of the 303 businesses surveyed). Statistics Canada classifies an industry with less than \$5 million in sales as a small business. A medium-size business has sales between \$5 million and \$25 million per year. Businesses with sales above \$25 million are considered large.

By this classification, businesses related to agriculture in PRSD&G are generally small in size. Fifty-nine percent of the businesses surveyed (173 of 295), had sales under \$500,000. This study found that agriculture-related businesses have a wide range of sales, and some with very high sales. The average total gross sales for the 295 businesses that provided sales data is \$1,605,329. This number is substantially lower than the average gross sales of \$4,240,865 for the 154 businesses surveyed in Huron County in 1996 (Cummings et al, 1998). Only three businesses in PRSD&G had sales in excess of \$25 million; the top quarter had sales over \$1.5 million. This number is more in line with Huron County's top quarter, which had sales in excess of \$1.7 million. Overall, the total gross sales for all businesses surveyed in the PRSD&G study, including sales related and unrelated to agriculture, was \$473,572,000.

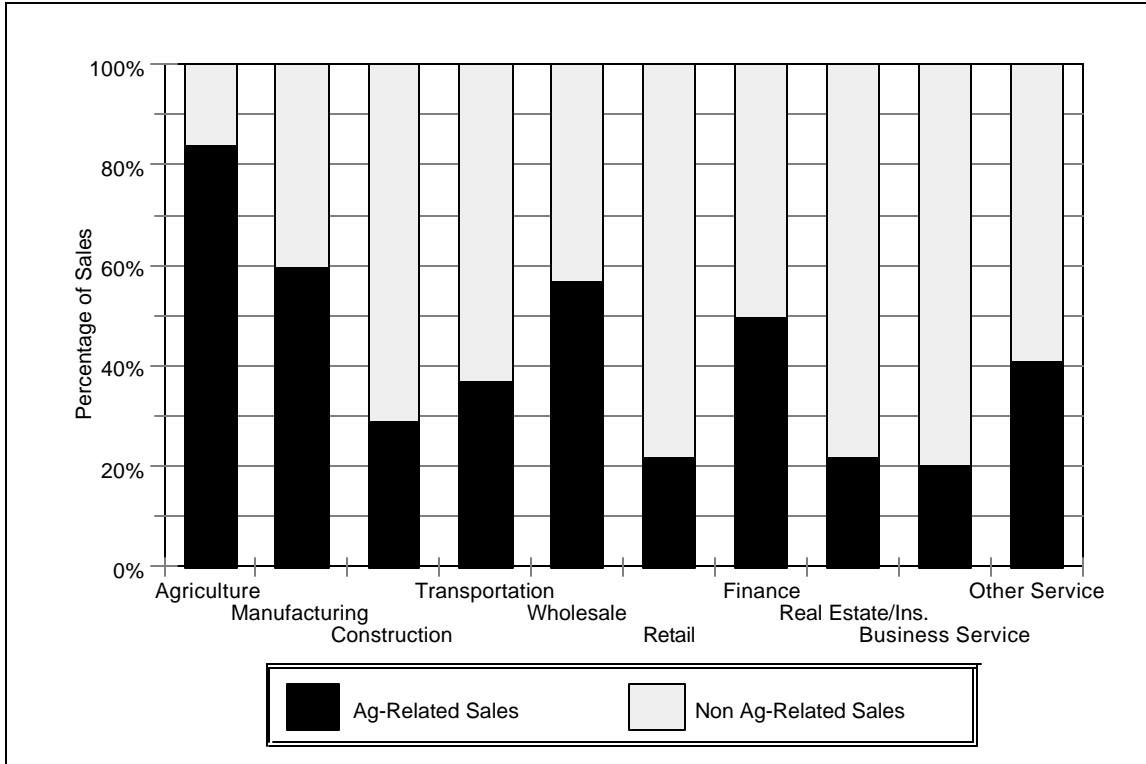
On average, the businesses in the study attributed 42.1 percent of their sales to the agriculture sector. As a result the total for agriculture-related sales for these businesses

was \$199,591,970. The average agriculture-related sales for the 295 businesses that provided sales data was \$675,843. There were a number of businesses with high agriculture-related sales figures. Fifteen percent of the businesses (45 of 295) had agriculture-related sales in excess of \$1 million. More than half of the businesses surveyed had agriculture-related sales below \$100,000.

i) Agriculture-Related Business in the Agriculture and Related Service Industry

Average gross sales for the surveyed agriculture and related service businesses are just over \$850,000. Eighty-four percent of sales from these businesses are attributed to the agriculture sector, for an average total of agriculture-related sales of just over \$720,000 (see Chart 5 below).

Chart 5: Percentage of Agriculture-related Sales According to Business Type, (for Businesses Surveyed



Source: 1998 Ag-business Survey

ii) Agriculture-Related Business in the Manufacturing Industry

The study found that surveyed manufacturing businesses providing goods and services to farmers are dependent on the agriculture sector for 60 percent of their sales. The average gross sales for these businesses is approximately \$600,000, of which about \$360,000 can be attributed to agriculture.

iii) Agriculture-Related Business in the Construction Industry

Average gross sales for surveyed businesses in the construction industry in PRSD&G is just over \$763,000. Of this, 29 percent, or \$217,000 can be attributed to sales related to agriculture. As in Huron County, sales in plumbing, heating and electrical services were especially linked to agriculture.

iv) Agriculture-Related Business in the Transportation and Storage Industry

Surveyed transportation businesses in PRSD&G had average gross sales of \$1.3 million dollars. Of this, 37 percent, or \$486,000 can be attributed to sales related to agriculture. This includes transportation and storage of agricultural chemicals, livestock and other agricultural products.

v) Agriculture-Related Business in the Wholesale Trade Industry

The study found that surveyed wholesale businesses providing goods and services to farmers are also dependent on the agriculture sector for their sales. The average total gross sales for the surveyed wholesale businesses is just under \$2.5 million. Of this total, 57 percent, or approximately \$1.4 million are attributed to sales in the agriculture sector.

vi) Agriculture-Related Business in the Retail Trade Industry

Retail stores typically sell products for personal or household use. However, many also sell products to the agriculture sector. Average gross sales for the surveyed retail businesses was over \$2.5 million, with 22 percent, or approximately \$570,000 being attributed to sales related to agriculture.

vii) Agriculture-Related Business in the Finance Industry

As mentioned previously in this report, sales data for finance institutions was calculated by multiplying the number of employees at the branch surveyed by an average annual salary of \$40,000. By using this method, the total average gross sales for surveyed finance businesses was approximately \$375,000, with 50%, or about 187,000 being attributed to serving the agriculture sector.

viii) Agriculture-Related Business in the Real Estate and Insurance Industry

Average sales for the surveyed real estate and insurance businesses involved with the agriculture sector in PRSD&G are slightly over \$2.8 million, with 22%, or about \$619,000 of these sales being related to agriculture.

ix) Agriculture-Related Business in the Business Service Industry

The business service industry includes legal and accounting firms. Average total gross sales for surveyed businesses in this industry were approximately \$360,000, with 20 percent, or just under \$74,000 being attributed to sales related to agriculture.

x) Agriculture-Related Business in the Other Service Industry

Average total gross sales for surveyed businesses in the Other Service Industry were slightly over \$382,000. Of this total, \$158,000, or 41 percent were attributed to sales related to agriculture.

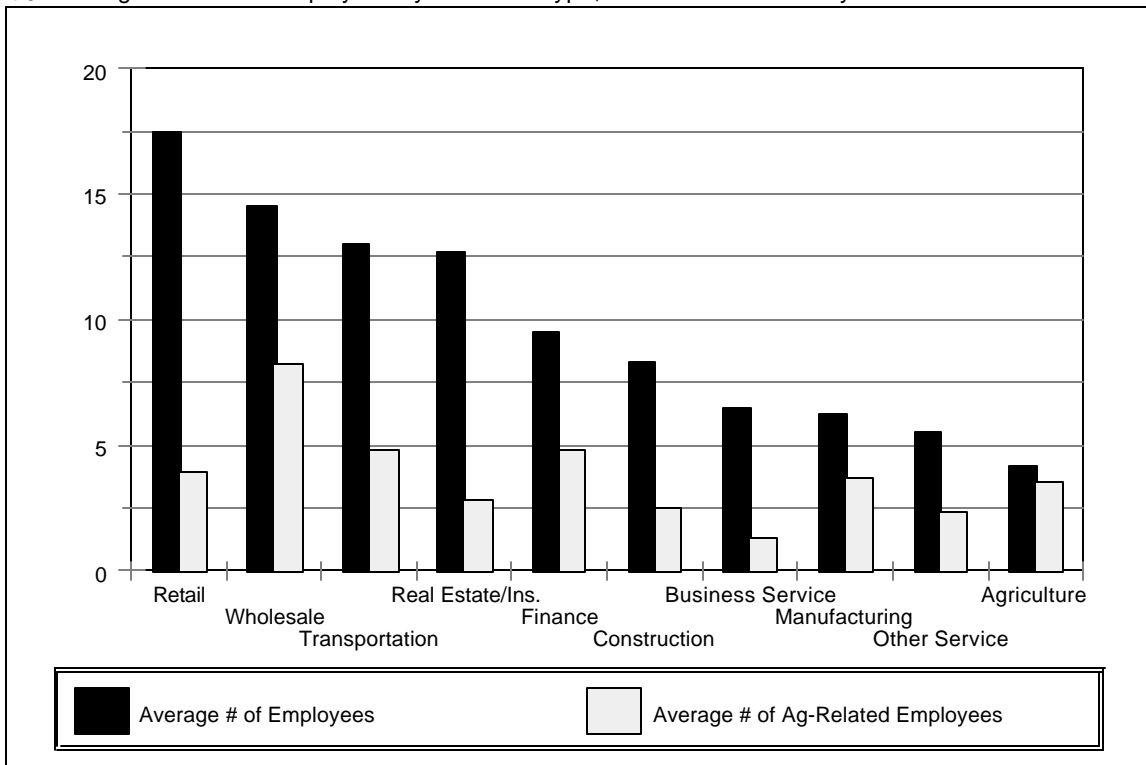
b) Employment for Agriculture-Related Businesses Surveyed

The number of employees in a business is another indicator of the importance of that business in the economy. According to Statistics Canada, a small business employs

one to fifty people; a medium business employs 51 to 250 people and a large business employs over 250 people.

By this standard, 98 percent of the agriculture-related businesses in the study are small (296 of 302 that provided employment data). The average number of employees (as calculate by FT jobs) for the businesses surveyed is 11. However, more than half of the businesses surveyed have less than 5 employees, and 70 percent of the businesses surveyed have less than 10 employees. Chart 6 shows the average number of employees by business type for the businesses surveyed.

Chart 6: Average Number of Employees by Business Type, for Businesses Surveyed.



Source: 1998 Ag-business Survey

All of the businesses in the study exchange goods and/or services with the agriculture sector. It is assumed that each of these businesses must also have employees working either full-time or part-time on activities to serve the agriculture sector. Of the businesses surveyed, 42 percent had at least two employees working on agriculture-related activities.

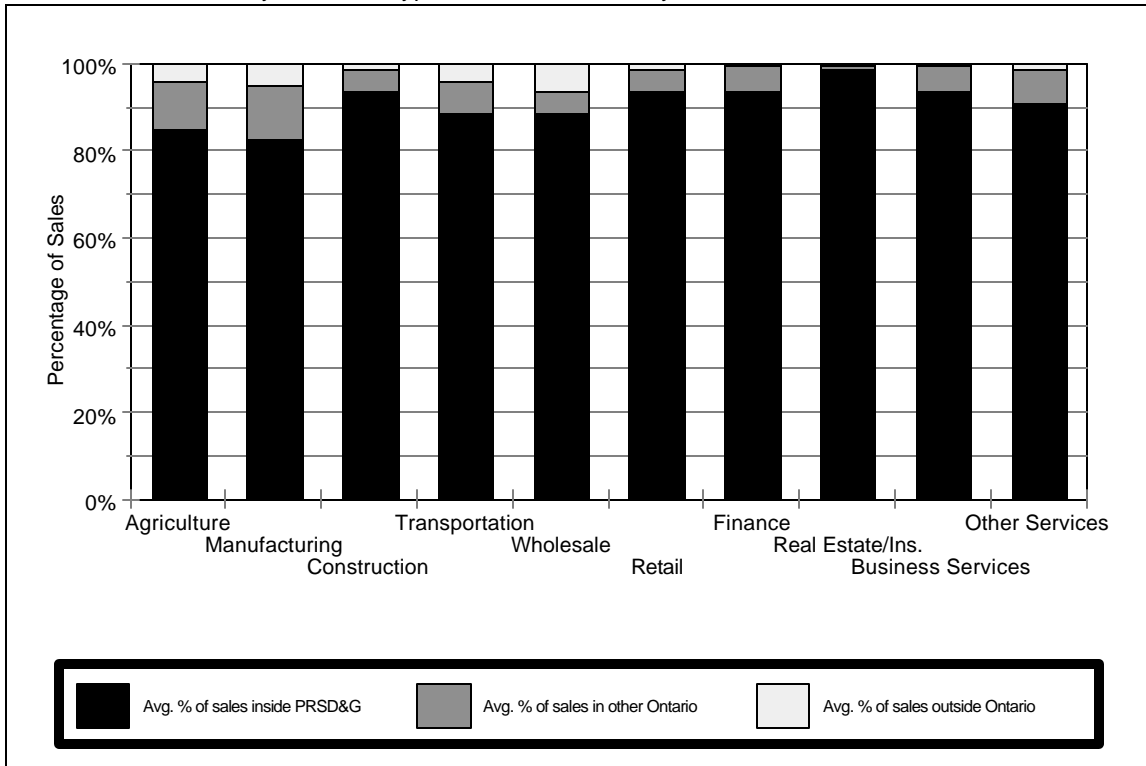
5.2.2.4 Exports of Agriculture-Related Businesses Surveyed

According to the 295 businesses that provided sales data for the study, 91.6% of their sales are exported outside PRSD&G Counties. In total, 5.8% of the sales are exported to other locations in Ontario (except PRSD&G), and 2.8% percent are exported

outside of Ontario. These sales represent the total sales for all the agriculture-related businesses surveyed, although they include sales related to and unrelated to agriculture.

As shown in Chart 7, agriculture and related services export 11 percent of their goods and services to locations outside PRSD&G, but inside Ontario. Four percent are exported to locations outside Ontario. The businesses surveyed in the manufacturing industry export 12 percent of their products to locations outside of PRSD&G, but inside Ontario, with another five percent being exported outside of Ontario. Transportation industries export seven percent of their services outside PRSD&G, but inside of Ontario, with an additional four percent of sales being made outside of the province. Wholesale industries export five percent of their goods to locations outside of PRSD&G, with another six percent exported out of the province. The remaining industries: Construction, Retail, Financial, Real Estate/Insurance, Business Services and Other Services all retain more than 90 percent of their sales within PRSD&G, and vary in exporting from one to eight percent of their goods and services out of PRSD&G, but inside of Ontario, with one percent or less additional exports being made outside of Ontario.

Chart 7: Location of Sales by Business Type, for Business Surveyed



Source: 1998 Ag-business Survey

5.2.2.5 Summary: Agriculture-Related Businesses in PRSD&G Counties

The analysis shows that businesses that buy from or sell to the agriculture sector in PRSD&G Counties generate a sizable amount of money and jobs inside the area. Furthermore, for both employment and income, these companies generate flows of income and expenditure outside the area. It is estimated that \$692.7 million in agriculture-related sales generated in PRSD&G Counties by agriculture-related businesses. These businesses generated \$43.8 million in agriculture-related sales in other parts of Ontario and a further \$19.9 million outside of Ontario. This income is exchanged among the three regions (inside PRSD&G, outside PRSD&G but inside Ontario, and outside Ontario), which benefits local businesses. The total amount of agriculture-related sales for all three regions is \$756.4 million.

Businesses supported by agriculture generate additional sales in other sectors of the economy. Total sales of agriculture-related businesses in PRSD&G Counties reach \$1.79 billion, including sales related and unrelated to agriculture. This is shown in Table 19.

Table 19: Gross Sales Generated by all PRSD&G Agriculture-related Businesses

Location of Sales	Agriculture-related Sales (in \$millions)	Total Sales: Unrelated and Related to Agriculture (in \$millions)
Sales in PRSD&G Counties	692.7	1643.6
Sales in Ontario (except PRSD&G Counties)	43.8	104
Sales outside Ontario	19.9	47.3
Total Sales	756.4	1794.9

Source: 1998 Ag-business Survey

Indirect employment is a further impact of the agriculture sector. There are approximately 4,517 indirect agriculture jobs created by agriculture-related businesses in PRSD&G Counties. In addition, there are jobs supported outside PRSD&G counties by both PRSD&G residents purchasing outside the counties and by jobs in subsidiary location locations of PRSD&G businesses. Table 20 shows that 1,049 jobs maintained by PRSD&G agriculture-related businesses are supported by sales located outside of PRSD&G Counties. Of these, 381 are positions related to the agriculture sector. These jobs are supported through sales inside and outside of the counties and are important linkages for the PRSD&G economy. The total full time equivalent jobs created by agriculture-related businesses is approximately 12,440, including jobs related and unrelated to agriculture.

Table 20: Full Time Equivalent Indirect Jobs in Agriculture

	Agriculture-related Jobs	Total Jobs for All Agriculture-related Businesses in PRSD&G
Jobs in PRSD&G	4136	11391
Jobs outside PRSD&G	381	1049
Total Full Time Equivalent Jobs	4517	12440

Source: 1998 Ag-business Survey

5.2.3 Estimated Induced Sales and Jobs

Induced agricultural impacts are impacts on businesses that benefit from the expenditure of wages and salaries of workers in the agriculture and agriculture-related sectors. In order to estimate the induced sales in PRSD&G Counties, the total amount of agriculture-related sales for the area (\$1,120,950,174, made up of \$364,496,609 direct sales and \$756,453,565 indirect sales) was divided by the total amount of direct sales for

the area (\$364,496,609) to calculate a sales multiplier of 3.07 to be used in making a conservative estimate of induced sales for the PRSD&G area. In short, we can use this calculation to estimate that for every dollar in sales generated by direct agricultural sales (farm gate sales), an additional \$2.07 in sales related to agriculture is also produced.

Induced jobs in PRSD&G refer to service sector jobs that are supported by services purchased by agriculture employees. These represent jobs in the education, health and government service sectors. To make estimates of the induced jobs in PRSD&G, Prescott County was selected to represent the area as it has the greatest total direct agricultural sales. Total direct employment figures for Prescott County's two primary production industries, Agriculture and Manufacturing, (1685 and 3060 respectively for a total of 4745 jobs) were divided by the total number of jobs in the Education, Health and Government Service Sectors (1210, 1310 and 840 respectively, for a total of 3360 jobs). This calculation indicated that for every job created in the two primary production industries, 0.71 induced jobs were supported by them. When this number is applied to the total number of direct and indirect jobs related to agriculture for PRSD&G as a whole (5955 direct jobs and 4516 indirect jobs for a total of 10471 jobs), it indicates that 7415 induced jobs are supported by agriculture. When these three numbers are added together to estimate the total number of jobs related to agriculture in PRSD&G (5955 direct, 4516 indirect and 7415 induced for a total of 17886) and divided by the total number of direct agriculture jobs, a multiplier of 3.0 is the result. This calculation allows us to estimate that for every job in the agriculture sector, an additional 2.00 jobs related to agriculture are supported.

5.2.4 Total Direct, Indirect and Induced Impacts

There are 5,955 direct, 4,136 indirect and 7415 induced jobs created as a result of the agriculture sector in PRSD&G Counties. Thus, farm operations, businesses they buy from and sell to, and services that support farmers and farm businesses are estimated to support approximately 17886 jobs. In addition, there are \$364 million in direct and \$756 million in indirect sales associated with agriculture in PRSD&G Counties. Therefore, approximately \$1.12 billion in agriculture-related sales are generated in the PRSD&G economy.

5.3 *In-depth Analysis of Agriculture-Related Businesses: Case Studies*

As mentioned previously, ten to twelve businesses that participated in the Ag-business survey in PRSD&G will be asked to participate in an in-depth analysis of their business through a standardized long interview process and site visit. This will allow the researchers to modify the data received from these businesses, and enable modifications to be made to data to more accurately reflect existing conditions across the study area.

6.0 Results Conclusions

With approximately 19 % of employment in PRSD&G and \$1.12 billion in sales in the five counties, agriculture is clearly a very important player. This sector touches over 1100 businesses selling to agriculture as well as the vital public service sector.

Estimated expenditures of \$1.12 billion are generated by agriculture producers and agriculture-related businesses within PRSD&G Counties. This is the estimated flow of sales and expenditures generated by farm operations as well as sales related to the agriculture sector. While previous estimates indicate that 5955 (Statistics Canada, 1996 census) jobs existed in the agriculture sector in 1996, a further 4516 jobs were tied indirectly to the agriculture sector in PRSD&G through expenditures by agriculture-related businesses, and an additional 7415 jobs were supported by agriculture in education, health and government service. Clearly, this has a significant impact on the economy of PRSD&G, where the total estimated number of jobs in 1996 is 88,110. Multipliers associated with the sales and employment data suggest 2 jobs off the farm for every 1 on the farm. Similar multipliers were linked to sales data.

All though these numbers are significant, it suggested that there may be some future opportunities. With fewer farms and higher levels of sales the trend over the last 25 years, we will see a move toward a more specialized agriculture. We can get a glimpse of that future in the more specialized and larger (in employment impact and value of sales) agricultural economy of Huron County (Cummings, Morris, McLennan, 1998).

We would also note the downside to specialization in the declining prices of basic agricultural commodities in the last year, and on previous occasions.

In terms of sales, the multipliers in Huron County are larger than PRSD&G- \$3.00 sales in ag related businesses for every \$1.00 in sales on farms. With respect to jobs, we find the same pattern. One direct job on the farm is related to 4 indirect and induced jobs off the farm. Much of this difference could lie in the role of agricultural exports. In Huron County, 35 percent of sales of ag related businesses are to places outside Huron County (29 percent to places in Ontario, 6 percent to places outside Ontario). The businesses are in general bigger with as an example 33 employees on average in Huron Ag. Related businesses and only 4 in PRSD&G businesses of the same type. The manufacturing businesses are also bigger and more important with 27 employees on average compared

to 6 in PRSD&G.

The opportunity exists in PRSD&G to expand the number and size of ag related businesses. Export markets could be tapped and more goods sold for local production, replacing imports. Even if farm jobs continue to decline (Huron County just reversed this trend in the last 5 years) we can expect multipliers to increase in a more capital intensive and productive local agriculture economy.

All parties interested in the local economy and role of the Agricultural sector are asked to remember the total impact of agriculture and its importance in the local economy. There may be a tendency to think of declining farm jobs as an indication of a sector that is no longer important. On the contrary, we have a vital agriculture sector, playing a large and important role, with significant prospects for the future.

The results we have presented here are preliminary. Our past experience is that the numbers are also conservative—we have purposely tried to choose lower estimates. However, we believe them to be representative and a starting point for debate, discussion and action.

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Appendix 1. Questionnaire

Study on the Economic Impact of Agriculture in the Five Counties Of: Prescott, Russell, Stormont, Dundas and Glengarry

1. Can I confirm that you are in the _____ business?
- 2 a) In which municipality _____ and county _____ is your business located?
- b) Please provide the 6-digit postal code _____.
- c) What other municipalities/counties does your business operates in (branches, head office).

Municipalities	Counties

3. Please estimate the total gross sales of your business between January 1, 1997 and December 31 1997. Just to clarify, we are not asking for your business profits. We just need to measure the size of the industry in the county. \$ _____

Suggestions:

- | | | | |
|----------------------------------|-------|-------------------------------------|-------|
| Less than \$100,000 | _____ | Between 750,000 and \$1,000,000 | _____ |
| Between \$100,000 and \$250, 000 | _____ | Between \$1,000,000 and \$2,500,000 | _____ |
| Between \$250,000 and \$500,000 | _____ | Between \$2,500,000 and \$5,000,000 | _____ |
| Between \$500,000 and \$750, 000 | _____ | Over \$5,000,000 | _____ |

- 4 a) Do you sell your products or services to farmers?
Yes _____ No _____

If yes, what percentage of your total gross sales relates to sales to farmers and/or other agriculture-related businesses?
_____ % (If Yes, proceed to Question #5)

- b) Do you buy products from farmers?
Yes _____ No _____

If yes, what percentage of your total gross sales relates to products of agricultural origin?
_____ %

5. Referring now to the agricultural sales, where are these sales being made? (Note that "the counties" refers to the counties of Prescott, Russell, Stormont, Dundas and Glengarry

What percentage of sales is done inside the counties? _____ %

What percentage is outside the counties, but inside the province? _____ %
 What percentage is outside the province, but inside Canada? _____ %
 What percentage is outside Canada? _____ %
 100 %

6 a) The next question deals with the products and services your business sold to the agriculture sector in 1997. This means products and services sold to farmers and other agriculture-related businesses. Please list the 5 most important products/services in order of importance.

Products & Services Sold	In the Counties		Out of the Counties	
	Yes	No	Yes	No
1.				
2.				
3.				
4.				
5.				

6 b) Please list, in order of importance the products and services that your agriculture-related business bought from suppliers in 1997. (Note : include only supplies used in agriculture related sales.) Also indicate if these products/services were bought in the counties or out of the counties.

Products & Services bought	In the Counties		Out of the Counties	
	Yes	No	Yes	No
1.				
2.				
3.				
4.				
5.				

7. This question relates to the number of employees in the business in 1997. Please include yourself, other owners and family members in this question. Be sure to include the owner of the business as a full-time employee. This includes anyone working for the business, whether waged or unwaged.

	# of employees	# hours/day	# days/year
Full-time			
Part-time			
Seasonal			

8. Do you have any other comments or suggestions?

Thanks for your time!