Economic Impact of Agriculture on the Economy of Huron County

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This report represents the opinion of the authors and does not represent the opinion of the supporting organizations.

Executive Summary

Often, the value of the agriculture sector is measured by the number of agriculture jobs in the economy. Over time, a decline in the number of these jobs has been interpreted as a sign of a fading industry. In fact, the number of direct jobs created by agriculture is an accurate but *incomplete* measurement of its impact on a given economy.

Recognizing this, the Huron County Federation of Agriculture initiated a study in 1996 to investigate a more accurate measurement of the impact of agriculture. At that time, jobs in farming were on the decline in the county, but the value of agriculture production continued to grow. There was considerable data on the role of farms and farmers, but little information available on the linkages between agriculture and the rest of the economy. New sectors such as tourism were on the increase but little was known about the exact magnitude of their impact. Planning was happening at the County and provincial level without benefit of a complete picture of important sectors of the county economy.

Given these facts, the Federation approached the University of Guelph to discuss a study with the objective to estimate the total economic impact of agriculture on the Huron County economy. All impacts, including direct, indirect, and induced, were to be estimated.

The authors took up this challenge, with the end result being this report. The study involved a combination of "economic base" and "input-output" methods. Statistics Canada data and similar studies were used to estimate the direct and induced impacts, while the indirect impact was calculated using a survey of businesses related to agriculture.

A draft report was prepared and shared with organizations in the County in 1997. This was followed by additional in-depth work on agriculture, including case studies of agriculture- related businesses operating in the county. Work also began in 1997 to study the impact of tourism. The Huron County Planning and Development Department and the Huron Tourism Association supported this work. A companion study on tourism is being completed at this time.

This document represents the final report for the agriculture study and includes a discussion of the research background, the methodologies used and the results of the analysis. In summary, the authors estimate that there are $512 million in direct agriculture sales and $1.5 billion in indirect agriculture sales in the county. The value of sales in the "induced" (services supporting employees related to agriculture) sector was not estimated. With respect to jobs, the latest data suggests 4,428 direct jobs for farmers, 12,128 indirect jobs for workers in businesses related to agriculture and 3,528 jobs in the induced sector. This means that for every direct job in agriculture, approximately four jobs are supported in the wider economy outside agriculture. This was estimated through an input-output like methodology using the findings of our agriculture-related business survey. A more general economic base analysis using Statistics Canada and other data suggests a more conservative result. For each job in agriculture, 1.8 jobs are produced in supporting services.

All the estimates indicate that the jobs supporting agriculture are more important than those within agriculture. Furthermore, substantial sales volume is created by agriculture throughout the county economy.

In fact, Huron County produces more farm gate sales than four provinces in Canada. This is significant considering that the county population is only around 55,000.

The data suggest that agriculture remains the largest and most important sector in the county. New employment and economic opportunities can be found within and related to the agriculture industry. Planning and policy should take this into account and recognize that the future of the agriculture sector lies in continued development of the agriculture and agri-related industries.

The methodology used for this study can be applied to any County or District. A supporting manual on how to do this work is available from the Huron County Federation of Agriculture or through Harry Cummings (519-824-4120 ext. 3637; email: hcumming@rpd.uoguelph.ca) at the University of Guelph.

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Thank you very much. Sincerely;

Bill Wallace
Steve Thompson
Henry Boot
Impact Study Committee

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1.0 Introduction

This research report attempts to identify and measure the economic impacts of agriculture on the Huron County economy. Researchers made specific attempts to measure the direct and indirect impacts of agriculture. Indirect impact research focused on agriculture-related businesses, defined as businesses that buy products and services from, and/or sell products and services to, the agriculture sector. Researchers also studied the induced impacts of agriculture to illustrate the importance of agriculture to the entire county economy.

The main method of analysis was an "input-output-like" approach using a telephone survey conducted in the summer of 1996. The aim of this analysis was to understand the nature and depth of agriculture's indirect impacts on the county economy. Researchers reviewed relevant secondary data, including Population Census of Canada reports and studies concerning the impact of agriculture on a relatively small region. Further calculations of the direct and induced impacts were also completed. A preliminary paper outlining the research findings was produced in December 1997. This was followed by further analysis to test the findings and finalize the results. Closer analysis of the extensive linkages between agriculture and the rest of the Huron County economy was also conducted. This final report provides a discussion of the research background, results of the analysis and the methodologies used in the study.

This methodology has been used several times since the Huron County study in 1996. Currently, a study is underway to assess the economic impact of agriculture in Simcoe County. It includes the development of a socio-economic profile of the County and a profile of the County's agricultural economy, using Statistics Canada (e.g. Census of Agriculture, Census of Population), and other secondary data. The study also includes a review of relevant literature, a survey of agriculturally-related businesses and the development of a strategic plan for agriculture and human resource development in the County.

An economic impact study was recently completed on Farmer's Markets in Ontario. This study assessed the direct impact of farmer's markets on the community economy in terms of jobs and level of sales. It also measured the indirect impact of farmer's markets on the local economy, particularly local businesses. Nineteen markets from Fort Frances to Hamilton to Ottawa were studied.

An economic impact study was also undertaken in the five counties of Prescott, Russell, Stormont, Dundas and Glandgarry. The impact of agriculture and agriculture-related businesses on the economy of the five counties as a whole and individually was calculated. The methodology included the development of an inventory of 1,300 agriculture-related businesses, a survey of selected businesses, and an analysis of Statistics Canada Population Census and Census of Agriculture data. The study used a combination of "economic base" and "input-output" methods.

Other industries can benefit from an input-output-like approach. For instance, the researchers returned to Huron County to conduct a study estimating the economic impact of the tourism industry. The methodology included a mail-out survey to 1,300 tourism-related businesses. A comparison between the tourism and agriculture sectors could thus be made.

Interest in the economic impact methodology developed in this paper has been great. In the spirit of shared knowledge, the authors wrote a "handbook" discussing, step-by-step, our approach to measure the

economic impact of an industry. This document, *entitled "The Handbook on Estimating the Economic Impact of Agriculture"*, is available from the authors upon request. Contact Harry Cummings at (519) 832-1647 or fax (519)821-0202 or email at hca@web.net.

1.1 Background to the Research Project

Early economic development in Canada centered on several key staples in the manufacturing and primary sectors. Economic growth in many parts of Canada depended on agriculture in particular. Such is the case in Huron County. Over time, fear related to the decline of direct primary sector jobs led many decision-makers to seek new employment focuses. Communities were urged to replace traditional roles (such as agriculture service centres) with new roles (such as centres of retirement and recreation) (Troughton, 1992, p. 39). This trend can be witnessed across Canada where communities are making efforts to diversify their economic activities.

These efforts, however, may be at the expense of traditional regional economic sectors. The historical primary economic activities which provided the original *raison d'etre* for many communities have become secondary in some communities (while remaining vital in others). The agriculture sector is one such industry and is under continued scrutiny due to declining direct job numbers. Failure to continue past job growth has led many decision-makers to under-emphasize the impact of agriculture and other primary industries (Kulshreshta, 1988, p. 431).

While it is true that direct employment in primary sector activities is declining relative to other sectors, the value of these activities often remains the same and is, in some instances, increasing. Thus is the case in Huron County, where the value of farm gate sales has risen substantially while agriculture employment has declined steadily over the past several census periods. At the same time, service sector employment has risen dramatically, providing marked job growth (Statistics Canada 1986, 1991; OMAFRA, 1995). As direct employment in the agriculture sector of Huron County declined in real terms and relative to other economic sectors, local planners and others began discounting the importance of the agriculture sector.

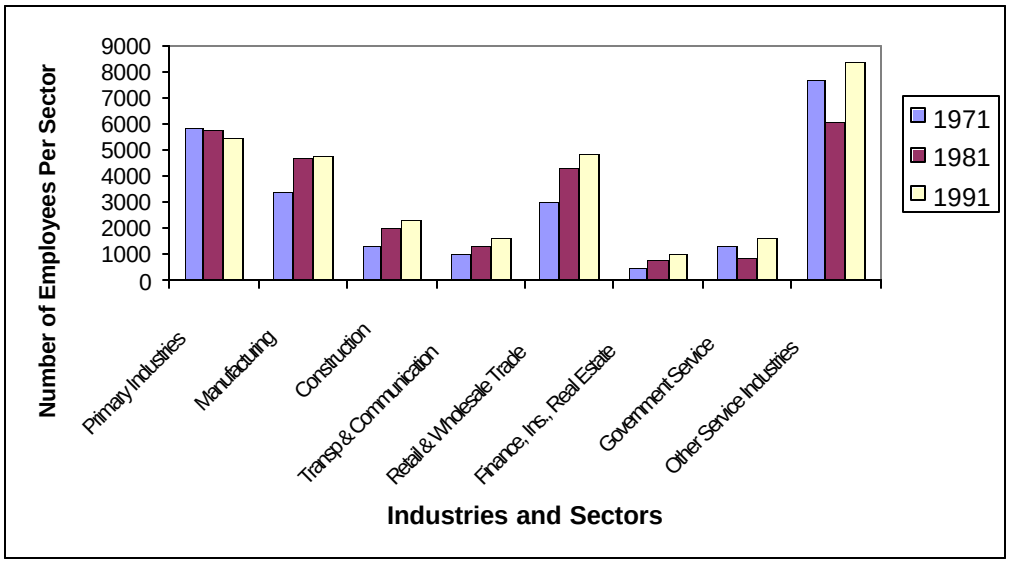
1.2 Introduction to the Huron County Research

As mentioned above, there has been a growing perception that agriculture is an industry in decline. This project was developed to examine the validity of this perception in Huron County. Specifically, several key local issues helped to instigate this research. These began with the closing of Centralia College and culminated with the release of *Huron County Study - Background Report* (The Rural Voice, 1996, p. 18; Wallace, 1996; Huron County Planning and Development Department, 1991). Ultimately, this study was undertaken by the Huron County Federation of Agriculture after a 1991 report on the county's economy identified agriculture as a declining industry (Huron County, 1991, p. 6). The report, published by the Huron County Planning Department, stressed the importance of moving to a new emphasis in economic development for the county (Huron County, p. 42). Notably, the 1997 revisions to the Huron County plan indicate a renewed focus on agriculture and recognition of its broader role.

1.3 The Dominant Service Sector

There is a general trend of rising service sector employment in Huron County; a phenomenon found in many regions. Table 1 and Chart 1 on the following page indicates that there were 6,100 employees working in education, health, welfare, professional, accommodation and food service industries living in Huron County in 1981. This increased to 8,400 service sector jobs by 1991, a 37.7 per cent increase over a ten-year period (Statistics Canada, 1991). Trade finance and government services also grew substantially in the 1971-1991 period. Overall, the emergence of the service sector as a prime employment sector is clear. What is not clear is how this relates to the traditional primary and manufacturing employment in rural areas.

Chart 1. Breakdown of Employment Changes for Huron County, 1971 to 1991



Source: Statistics Canada 1975, 1984 and 1991.

Table 1. Breakdown of Employment Changes for Huron County, With Percentage Changes, 1971 to 1991 (figures for Chart 1)

Industries and Sectors	Number of Employees Per Sector				
	1971	1981	1991	% Change 1981-1991	% Change 1971-1991
Primary Industries (1)	5,840	5,810	5,495	**-5.4**	**- 5.9**
Manufacturing	3,420	4,730	4,790	**1.3**	**40.1**
Construction	1,350	2,015	2,305	**14.4**	**70.7**
Transportation, Communications & Other Utility Industries	1,060	1,375	1,615	**17.5**	**52.4**
Trade (2)	3,005	4,330	4,840	**11.8**	**61.1**
Finance, Insurance & Real Estate Industries	540	790	1,015	**28.5**	**88.0**
Government Services	1,355	890	1,620	**82.0**	**19.6**
Other Service Industries (3)	7,675	6,100	8,400	**37.7**	**9.4**
Totals (4)	21,960	26,045	30,080	**15.5**	**37.0**

(1) Includes agriculture, forestry, fishing, trapping, mines, quarries and oil well industries.
(2) Includes retail and wholesale trade.
(3) Includes education, health and welfare, professional and accommodation and food service industries.
(4) Discrepancies in totals are due to rounding by Statistics Canada tabulations.
Source: Statistics Canada 1975, 1984 and 1991.

2.0 Profile of Huron County

Counties in southwestern Ontario, including Huron, began as a series of settlements servicing their rural hinterlands. These counties have changed considerably since the mid-1800s. This section will provide a profile of Huron County, focusing on the rise and fall of certain sectors, including agriculture.

2.1 Agriculture Sector Profile: Huron County

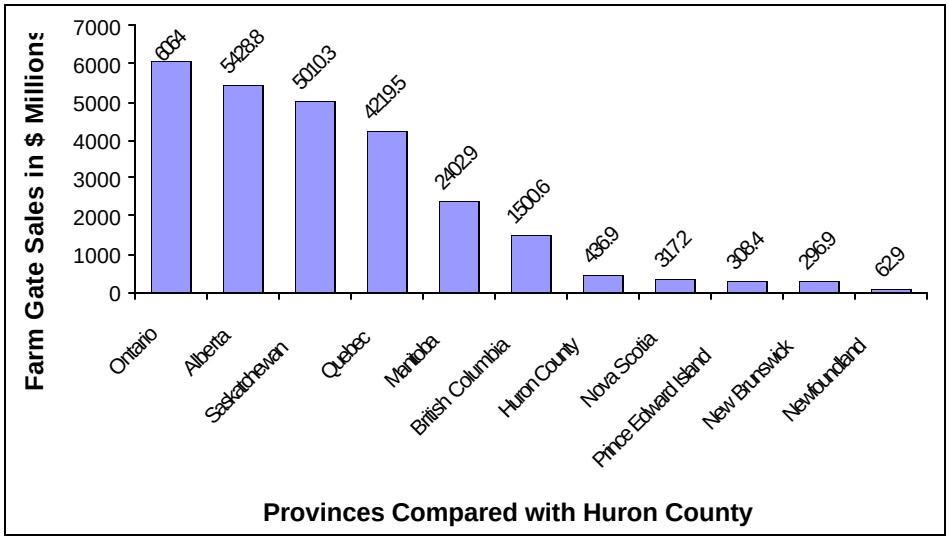
Traditionally, the Huron County economy has been based on agriculture and related services. This is changing, however, as the service sector accounts for a greater percentage of county employment. Historically, communities in Huron were established to serve the surrounding rural population. As time passed, however, these communities began to lose their service centre function and become rural residential locations. In recent times the trend has continued, with the establishment of fewer but larger commercial centres alongside mainly residential communities. As tourism has developed, many communities are becoming residential and cottage settlements, especially along the shore of Lake Huron. The economy of Huron County is becoming more service-oriented and less specialized on one sector; thus diversifying. Notably, the service sector seems to be increasingly serving the entire economy, including agriculture. Over the past decade, the agriculture service sector has retained relatively constant employment with slight increases. At the same time, this sector is becoming less focused on certain key sectors and is branching out into new areas.

2.2 Agriculture in the Economy of Huron County

While manufacturing and services account for most income generation in Ontario, a substantial part of the economy is dependent on the agriculture sector. In 1994, the value of Ontario farm gate sales was just over $6 billion including livestock and crop sales (OMAFRA, 1995, p. 3). Ontario agriculture is also important on a national level, providing valued produce for both the export and home-use markets. The value of Ontario agriculture production as a percentage of the total agricultural production of the nation (24 per cent) indicates this point (OMAFRA, 1995, p.7).

The value of agriculture is even more important to the regional economy. In Huron County, the value of farm gate sales was $436 million in 1991, more than any other county in the province. This grew to $512 million in 1996, a 17 per cent increase. To illustrate the relative importance of this, we have constructed a comparison of Huron County to the ten provinces.

Chart 2: Value of Farm Gate Sales: Huron County Compared to Provinces 1991



Source: OMAFRA, 1995.

When the value of Huron County farm gate sales in 1991 is compared to the provincial values Huron County ranks seventh behind British Columbia and ahead of the four Atlantic Provinces in value of gate sales produced (see Chart 2). This clearly shows the magnitude of Huron's agriculture production.

In 1991, Huron County had 3,260 census farms, more than in any other county in Ontario.[1] In 1996, this decreased to 3,150 farms. The approximate area under production in 1991 was 621,878 acres (OMAFRA, 1995, p. 28). This area, which accounts for 5.6 per cent of the area cultivated in Ontario, produces 7.2 per cent of the gross farm gate sales for the province. The comparison in Table 2 identifies the importance of the county's agricultural production relative to the rest of the province.

Table 2. 1991 Farm Gate Sales for Huron County and Ontario

[1] Statistics Canada classifies a census farm as those with sales greater than $200,000.

Farm Gate Sales	Farm Gate Sales ($ millions)
Huron County	436
Ontario	6,064
Huron County Sales as % of provincial total	7.2

Source: OMAFRA, 1995.

As stated, agriculture production in Huron County has significant value. It is also notably diverse. Table 3 illustrates the division between farmland uses in Huron County. Crop production is by far the most frequent use, followed by pasture use. The land accounted for by crop production in Huron County accounts for approximately 75 percent of county land with further portions used for pasture. Other areas account for non-agriculture uses involving industry and urban settlement.

Table 3. Land Area Classified by Use, 1991 (in acres)

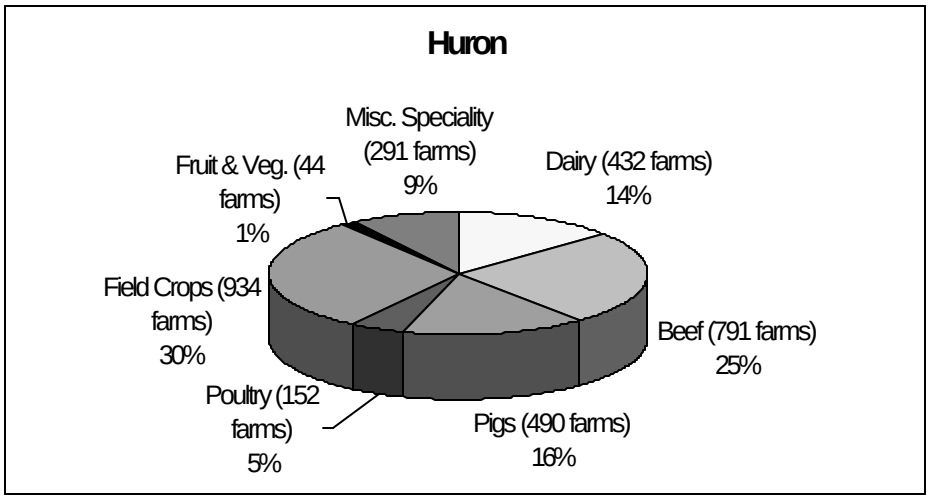
	Under Crops	Summer Fallow	Improved Pasture	Unimproved Pasture	Other[2]	Total
Huron County	557,448	2,352	34,422	27,656	89,647	744,525
Ontario	8,430,414	157,301	964,235	1,574,246	2,344,.457	14,470,653
Huron County/Ontario (%)	6.6	1.5	3.6	1.8	3.5	5.28

Source: OMAFRA, 1995, p. 28.

In 1991, the most common farm types in Huron County produced small grains and livestock. Overall, 60 per cent of farms were classified as livestock producers while the rest (40 per cent) produce crops. Small grains accounted for the largest proportion of Huron County farms where crop production was the major activity. Very few crop operations focused on wheat production. This is reiterated by Van Hoeve's cluster analysis using 1991 agricultural census data. Van Hoeve carried out an analysis of all farms in Ontario and classified them by county. Huron County was classified as primarily grains and livestock (Van Hoeve, 1995, p. 121). Charts 3 and 4 outline these details explicitly, identifying Huron County and Ontario farms with sales greater than $2,500 by major farming activity.[3]

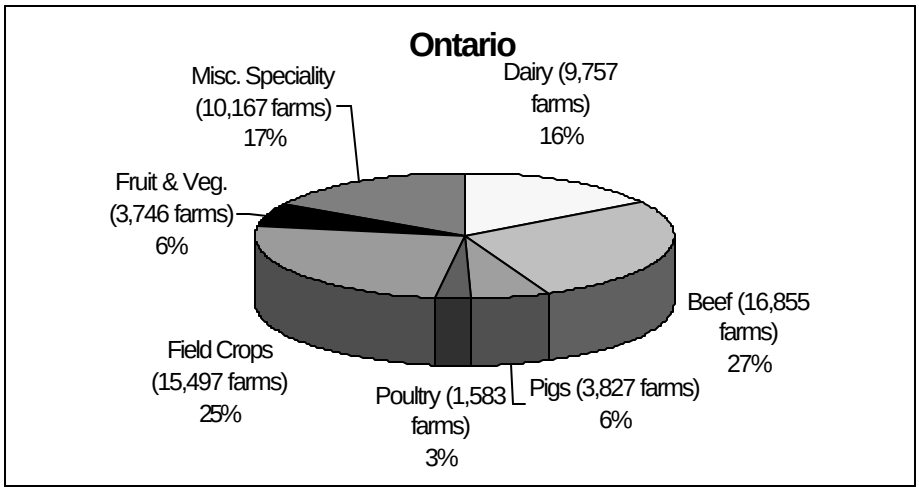
[2] Included are all non-farm uses.
[3] This classification was used to omit small hobby farms that might have skewed the results.

Chart 3: Huron County Farms Classified by Major Product, 1991 (farms with sales greater than $2,500)[4]



Source: OMAFRA, 1995, p. 31.

Chart 4: Ontario Farms Classi fied by Major Product, 1991 (farms with sales greater than $2,500)



Source: OMAFRA, 1995, p. 31.

Overall, agriculture contributes significantly to the Huron economy, generating substantial income for the county population. The Huron County agriculture sector is one of the most productive in the province, with consistently higher production compared with other counties.

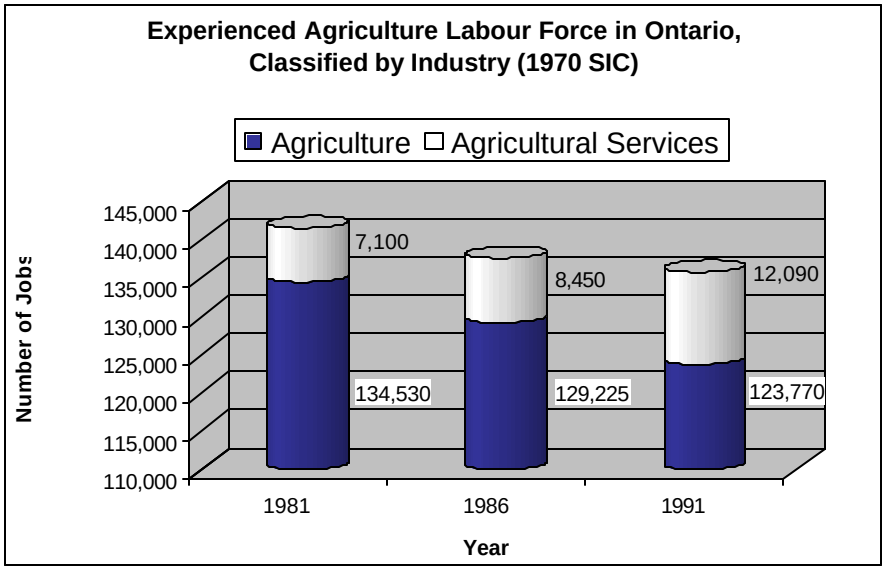
2.3 The Huron County Economy

While agriculture is the traditional mainstay of the county, it is only a part of the entire economy. This section will provide background on the county's economic structure as a whole. Note that this section refers only to direct jobs, and thus underestimates agriculture's entire impact. Agriculture's spin-off impacts on other sectors are estimated in later sections.

[4] The values for Charts 3 and 4 are found in Appendix 1.

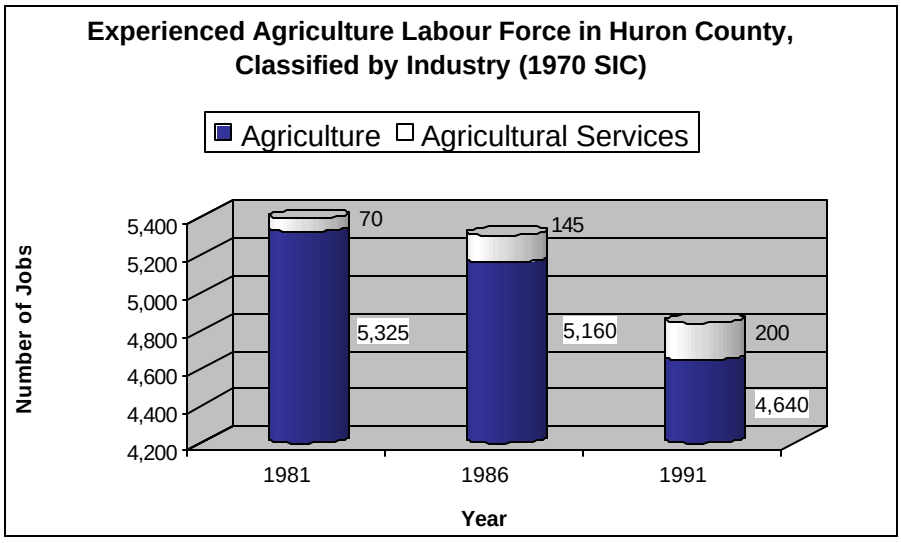
Charts 5 and 6 illustrate the relative importance of the agriculture sector for Ontario and Huron County by comparing data from 1981 to 1991 in the components of agriculture, agriculture-related, agriculture food processing, as well as non-agriculture components of the economy.

Chart 5: Experienced Agriculture Labour Force in Ontario Classified by Industry (1970 SIC).



Source: Cloutier, 1997.

Chart 6: Experienced Agriculture Labour Force In Huron County Classified by Industry (1970 SIC)



Source: Cloutier, 1997.

Chart 6 identifies a decline in direct agricultural employment in Huron County from 5,395 employees in 1981 to 4,845 employees in 1991 (a 10 per cent rate of decline). This includes employment associated with agriculture production and services related to agriculture. The number of employees in agriculture services is increasing relative to direct agriculture, rising from 70 (1.3%) employees in 1981 to 200 (4.1%) in 1991.

Table 4: Experienced Labour Force Classified by Industry (1970 SIC), Ontario and Huron County, Total

for Businesses Closely Related to Agriculture

Employees per Industry	Year	Food Transforma-tion Industry	Input Supply Industry	Grain Elevators	Agriculture Food Trade	Total Closely Related To Agriculture
Ontario	1981	103,140	16,825	2,315	144,690	266,965
	1986	102, 985	10,390	1,625	167,480	282,475
	1991	94,660	7,410	1,310	189,570	292,950
Huron County	1981	630	245	65	1,375	2,325
	1986	625	275	55	1,190	2,145
	1991	770	285	65	1,265	2,385

Discrepancies in totals are due to rounding by Statistics Canada.
Source: Cloutier, 1997.

Table 4 examines several industries closely related to agriculture, including the food transformation industry, the input supply industry, the agriculture food trade industry and the grain elevator industry. These industries together combine to form the "closely-related-to-agriculture" sector which has remained relatively constant in terms of employment in the county since 1981 (with the exception of a dip in 1986). This consistency is very important when other sectors that are declining outright are considered.

In total, the agriculture sector accounts for 7,230 employees in the Huron County economy. Identified in Table 5, this includes employment in agriculture (4,845 jobs) and industries closely related to agriculture (2,385 jobs) identified in Chart 6 and Table 4. Total agricultural employment in 1991 accounted for approximately 23.8 per cent of the total county employment. This level declined, largely due to decreases in direct agriculture, from approximately 29.2 per cent of total employment in 1981 (Cloutier, 1997).

Table 5: Experienced Labour Force Classified by Industry (1970 SIC), Ontario and Huron County, Agriculture-Related and Non-Agriculture Components

Employees per Industry						
	Year	All Other Industries	Indeterminate Activities	Total Closely Related To Agriculture	Total Agriculture	Totals
Ontario	1981	3,927,180	137,045	266,965	141,630	4,472,825
	1986	4,302,650	154,230	282,475	137,670	4,877,025
	1991	4,270,270	247,115	292,855	135,855	5,484,195
Huron County	1981	17,975	725	2,325	5,395	26,415
	1986	19,475	830	2,145	5,305	27,760
	1991	21,690	1,455	2,385	4,845	30,370

Source: Cloutier, 1997
Discrepancies in totals are due to rounding by Statistics Canada.

It should be noted that this "closely-related-to-agriculture" category is not equivalent to the term "agriculture-related employment" used elsewhere in this study. Agriculture-related businesses are defined in the methodology and results of this report as industries that sell to and/or buy from agriculture producers. This encompasses a wide range of industries, and involves a large proportion of employment in Huron County. This sector transcends the entire economy by including manufacturing, professional service, retail and wholesale, as well as specific agriculture services.

In 1991, the Huron County labour force consisted of 30,255 people over the age of 15. Overall, this is an increase of 8.6 per cent from 1986 (Statistics Canada, 1986, Statistics Canada, 1991). Accompanying this growth in the labour force are structural changes in the county economy, including a decrease in the number of agricultural jobs. In 1986 there were 5,305 people working in the agricultural sector. This decreased by 8.6 per cent to 4,845 jobs in 1991. If this trend continues, we estimate that there will be an estimated 4,428 direct employees in the agriculture sector in 1996. This is demonstrated in Table 6.

Table 6: Agriculture Employment in 1996: Huron County

Number of Employees	1991	%age change from 1986	Estimates for 1996
Agriculture and related services	4,845	- 8.6	4,428

Source: Statistics Canada, 1996b, Statistics Canada 1991b

The major employment sectors in Huron County in 1991 were the service sector; agriculture and its diverse related services; manufacturing; retail services; health services and construction. Recall from Table 1 that major trends since 1971 include a declining primary sector and a rising service sector. The increase in service sector employment is important as it represents a resurgence of government and other service sector industries over 1981 when finance, government, and other services sector employment numbers were down drastically from 1971. Between 1981 and 1991 there was a 37.7 per cent increase in service industries, including accommodation and food service industries, education, health and social service institutions and professional service industries. Government services increased by 82 per cent in the same period. The construction, trade and finance sectors have all commanded consistent employment growth since 1971. The manufacturing sector in the county leveled off in 1991 from substantial employment growth (38 per cent) between 1971 and 1981. In the primary sectors, the decline between 1971 and 1981 was very slight; however, by 1991, the decline over 1981 was significant at five per cent (Statistics Canada, 1975; Statistics Canada, 1984; and Statistics Canada, 1991b).

A more in-depth analysis is afforded by looking at the employment numbers for the three censuses of 1981, 1986 and 1991. This information is contained in Table 7. By looking at the inter-censal period it can be seen that, although the overall trend from 1971 to 1991 illustrated in Table 1 was for declining primary employment, this sector actually grew between 1981 and 1986. However, by 1991, the sector had again declined. It can also be seen that the manufacturing sector peaked in 1986 at 5,220 employees and fell to 4,790 by 1991. This could potentially be the start of a long-term trend for the manufacturing sector. All other sectors

grew consistently between 1981 and 1991 (Statistics Canada, 1984; Statistics Canada, 1986b; and, Statistics Canada, 1991b).

Table 7: Breakdown of Employment Changes for Huron County, 1981, 1986, and 1991 with Estimates for 1996

Industries and Sectors	Number of Employees by Year				
	1981	1986	1991	% Change 1986-1991	1996 Estimates
Primary Industries (1)	5,810	5,960	5,495	-7.8	5,066
Manufacturing	4,730	5,220	4,790	-8.22	4,395
Construction	2,015	1,765	2,305	-30.56	3,010
Transportation, Communication & Other Utilities	1,375	1,445	1,615	11.76	1,805
Trade (2)	4,330	4,350	4,840	11.26	5,385
Finance, Insurance & Real Estate	790	865	1,015	17.34	1,191
Government Services	890	1,155	1,620	40.26	2,272
Other Service Industries (3)	6,100	6,815	8,400	23.26	10,345
Totals (4)	26,045	27,575	30,080	9.1	33,469

Source, Statistics Canada 1984, 1986b, and 1991b.
1. Includes agriculture, forestry, fishing and trapping, mines, quarries and oil wells.
2. Includes Retail and Wholesale
3. Includes education, health and welfare, personal and accommodation and food services.
4. Discrepancies in totals are due to rounding by Statistics Canada.

From the inter-censal period between 1986 and 1991, several changes occurred which have implications for the 1996 results. Using the percentage changes from 1986 to 1991, the 1996 employment projections were completed. Of importance is the noted decline in both primary and manufacturing employment while the rest of the sectors continued their growth trends. With these projections, the service as well as the trade sector will usurp the primary and manufacturing sectors as leaders of direct employment in the county. Later in this analysis we indicate that spin-off from agriculture helps to maintain the service sector as the employment leader. It is important to note that this is only a projection as the 1996 census data was not yet available at the time of this writing.

Of equal interest is the data not shown in Table 7. Each category represents a collection of industries, which have been classified together due to incompatibility of census data from 1981, 1986 and 1991. The primary sector includes agriculture, fishing and trapping, logging and forestry, mining and quarry industries in the county. These sectors are separated out for the 1981 and 1991 censuses. The transportation sector includes communications, storage and the utility industries. The trade category represents both wholesale and retail trade, which are separated out for the 1991 census only. Finally, the "other services" category represents health and social service industries, educational service industries, accommodation, food and beverage service industries, business service industries and other service industries. This collection of industries represents the largest

employment sector of the county. What has been left out of the above discussion is the importance of wholesale and retail trade on the county economy. Throughout the 1970s and 1980s, Dahms (1982, p. 32) identified the growing importance of the wholesale trade function for the county. In Tables 1 and 7 wholesale trade is combined with retail trade. This makes it difficult to verify the trend of growing wholesale trade since the early 1970s (Statistics Canada, 1975; Statistics Canada, 1984; and, Statistics Canada 1991b). It is possible, however, to separate these two industries for 1991. In that year, wholesale employment was 1,335 while retail trade was 3,505 (Statistics Canada, 1991b). Researchers must wait for 1996 data to be made available to track the expected growth of these industries over time.

Huron County, with a rich agricultural past, has faced new realities over the past few years. It experienced the demise of its once numerous small communities to the point where several large communities service the county. At the same time, these new service centres have fortified themselves by gathering new functions and attracting new businesses. Goderich and Exeter are examples of newer, larger rural centres in the county.

Economically, Huron County's traditional mainstay has been agriculture. However, with continued employment growth in the construction, transportation and trade sectors as well as renewed growth in the finance, government and other services sectors, it might appear that agriculture is indeed on the decline. The researchers of this study argue that this is not the case as direct agriculture may be declining, but agriculture-related services and the businesses and services supported by agriculture continue to grow.

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 importance of a sector or a project on all sectors of the economy. The following is a discussion of the methodology upon which this study is based, namely, an “input-output-like” approach. (An economic base analysis of agriculture in Huron County is also available upon request from the authors.)

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 comprehensives of the model which desegregates the economy into individual sectors (Josling, 1966, p. 5). Desegregation permits analysis at the sectoral level, providing researchers with a close-up view of the economy. This dissected 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 the 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 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 exports of goods supports all other aspects of the economy (Bendavid-Val, 191, 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, 1991,p.78). The economic base multiplier is the ratio of total

employment to basic employment and indicates how many jobs in the 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, 1991,p.78).

There are a variety of methods to measure the economic base of a region. The main one used in this research is the location quotient. The LQ is a ratio of the regional share of employment in an industry as compared to the provincial employment in the industry. The method is based on the assumption that when an industry accounts for more than its share of the location quotient, theoretically, the portion of the location quotient above the regional average is considered an export industry. Given that, basic sector employment can be calculated as a percentage of the location quotient, with this representing the percentage of industry employment in the region. If the location quotient is less than one, then the basic level of employment will be zero. When the location quotient is greater than one, non-basic employment is calculated by subtracting the basic employment from the total sectoral employment in the region. Personal knowledge of the local economy is also used to estimate basic employment.

3.3 Multipliers

Given the previous discussion on input-output analysis, the reader may question where the application of this model 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 Hoeve, 1995, p. 66).

The multipliers calculated for this research include an expenditure multiplier and an employment multiplier. These have been used to estimate the induced impact of the agriculture sector on the Huron County economy.

4.0 Huron County Study Methodology

Initial research for the Huron County Study was carried out from April to August 1996. The economic impact of agriculture on the county economy was measured through an accounting of the total sales and employment of agriculture and related businesses in the county. [5]This work involved a review of primary data (Population Census of Canada, 1986 and 1991) to study the direct economic impacts of agriculture on the county economy. 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 products from the agriculture sector. The induced economic and employment impacts of the agriculture sector were also studied using primary data (Population Census of Canada, 1991).

Further work was carried out from April to August 1997. The purpose of this phase of the study was to verify the data collected during the summer of 1996. Modifications were made to the initial findings based on this work. A more in-depth look at the linkages between agriculture and the rest of the economy was also completed.

4.1 Direct Impact Methodology

A literature review was conducted to identify the direct impacts of agriculture in Huron County. Data was taken from the 1986 and 1991 Population Census of Canada. This provided a great deal of information about the economy of Huron County, including general labour trends and population data. Complete 1996 census data was not yet ready by the time of writing this document, so an extrapolation from the previous two census' data was done to estimate direct employment impacts. The process involved identifying the particular data for agriculture employment for both 1986 and 1991 data sets. From this, a rate of change in direct employment was projected to produce the 1996 data set. Results of this analysis are found in section 5.2.1.

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 in August 1996. The survey was conducted with the indirect businesses associated with agriculture – that is, businesses that either buy products/services from farmers, or sell products/services to farmers (for the farm business). The sample of businesses was randomly selected from a list of businesses provided by the Huron County Federation of Agriculture. This method enabled the researcher to identify the value of gross sales and the jobs produced by a sample of businesses related to agriculture. In 1997, these results were checked through personal interviews with past respondents in McKillop and Stanley Townships and the Town of Wingham. By using the 1996 survey results, combined with the 1997 interview results, the researcher estimated the economic impact of agriculture-related businesses (indirect employment and sales) for the county as a whole. Appendix 3 provides details on the methodology used for the indirect impact analysis. Results of this analysis are found in section 5.2.2.

[5] Agriculture-related businesses are defined as businesses that sell to or buy from the agriculture sector.

4.3 Induced Impact Methodology

A study of the induced effects of agriculture was conducted. Induced employment refers to service sector jobs supported by agriculture and agriculture-related employees. Two primarily agricultural townships were selected (Morris, McKillop) to estimate the number of induced jobs. Then, agriculture employment data from the 1991 census data was compared to service sector jobs in retail, health, education, government and other service sectors. Non-service sector jobs were also factored into the analysis. More detail on this is provided in section 5.2.3.

4.4 Case Studies: In Depth Analysis of the Linkages

During the summer of 1997, twelve agriculture-related businesses were randomly selected from the total number of businesses (220) that responded to the survey in the summer of 1996. A letter was sent to each of these businesses, followed by a phone call asking them to participate in a second phase of the study. Of the twelve that were contacted, all agreed to further participate in the study. They were asked to provide a tour of their business operation, and to be involved in a long interview regarding their business. This involved one to two hours of their time.

Interviews began with a tour of the business, with particular emphasis on the products purchased for the business, as well as the products sold by the business. During and after the tour, the researchers and owner(s) discussed the products and services sold by the business, with particular attention paid to those services and products purchased by the agriculture sector (forward linkages). As well, the products and services purchased for the operation of the business, with particular attention to those purchased from the agriculture sector (backward linkages), were discussed. Owners were asked to divulge the total value of sales, as well as the percentage of sales related to agriculture. Information was also solicited on the number and type of employees. Owners were urged to discuss local issues impacting their business, including changes in the agriculture sector. Finally, owners were asked about the changing status of their business, as well as their industry as a whole.

5.0 Results

5.1 Introduction to the Huron County 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 Huron County economy. This chapter will include 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, agriculturally related businesses in Huron County. Both primary and secondary data collection was undertaken; the primary research collection was an "input-output-like" survey approach and in-depth case studies with agriculture-related businesses. Further calculations of the induced and direct impacts were completed, based on Population Census of Canada data and, to some extent, on multipliers from other studies. The final analysis of the data illustrates that the agriculture sector is extremely important to the Huron County economy.

The aim of the study was to identify the total economic impact of the agriculture sector in Huron County. While published data show that farm gate sales were the largest for any county in the province of Ontario and that Huron County was one of the most productive agricultural areas in the province, there was no evidence to prove the actual impact of the agriculture sector. Similarly, published data showed that direct employment in agriculture for 1991 continued a downward trend. From this information, most people predicted this decline would continue while employment in other sectors would grow. Given this trend, estimates of some aspects of employment patterns in Huron County were made. Through a profile of Huron County, the direct impact of the agriculture sector was illustrated in employment data for the economy, which illustrated growth and decline industries for the county. However, this did not provide the full story of the economic impact of agriculture to Huron County. To provide a clearer picture of the indirect economic impact of the agriculture sector of the county, 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 effects of the agriculture sector on the rest of the Huron County economy. Direct sales are equivalent to the value of farm gate sales. In Huron County, the value of farm gate sales was $436 million in 1991, more than any other county in the province. This figure increased 17 per cent in 1996 to $512 million, an increase rate of 3.27 per cent per year. When the value of Huron County's direct sales is compared to Canada's ten provinces, Huron ranks seventh behind British Columbia and ahead of the four provinces in value of gate sales produced.

In 1991 the agriculture sector contained 4,845 employees (Cloutier, 1997). This number includes farm owners, operators and labourers. From this number, extrapolations provided an estimate of agriculture employees for 1996 by using the percentage change between 1986 and 1991. The estimated number of employees in the agriculture sector in 1996 is 4,428.

5.2.2 Estimated Indirect Sales and Jobs

The indirect impacts of agriculture refer to the impacts (i.e. value of sales and number of jobs) created by agriculture-related businesses. 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 agriculture-related 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 Huron County. Greater representation is found in and around Brussels, Goderich, Exeter, Seaforth, Lucknow, Wingham, Walton, Blyth, Clinton and Zurich. A limited number of agriculture-related businesses were found in and around Ashfield, Auburn, Crediton, Ethel, Kirkton, Lucan, Varna and Wroxeter.

The study found that Brussels has a concentration of construction and retail businesses serving the agricultural sector (according to 27 businesses surveyed). The town of Goderich hosts a relatively large number of agriculture-related businesses in the construction, transportation, retail trade and agriculture service industries (based on 33 surveyed businesses in Goderich). Wholesale trade industries serving the farming community are

well represented in Exeter (based on 22 surveys). There is a relatively high number of manufacturing, wholesale and agriculture related service industries in and around the town of Seaforth. Finally, Lucknow has a good representation of wholesale industries with agriculture-related sales.

Most (86 per cent) of the agriculture-related businesses surveyed in the county have only one business location. Ten percent of the businesses surveyed have outlets located inside Huron County. Thus, a business in this category may have its head office in Goderich and an outlet in Exeter. Four percent of the businesses surveyed have outlets both inside and outside Huron County. These typically have larger sales, employ more people, and have head offices located outside the county.

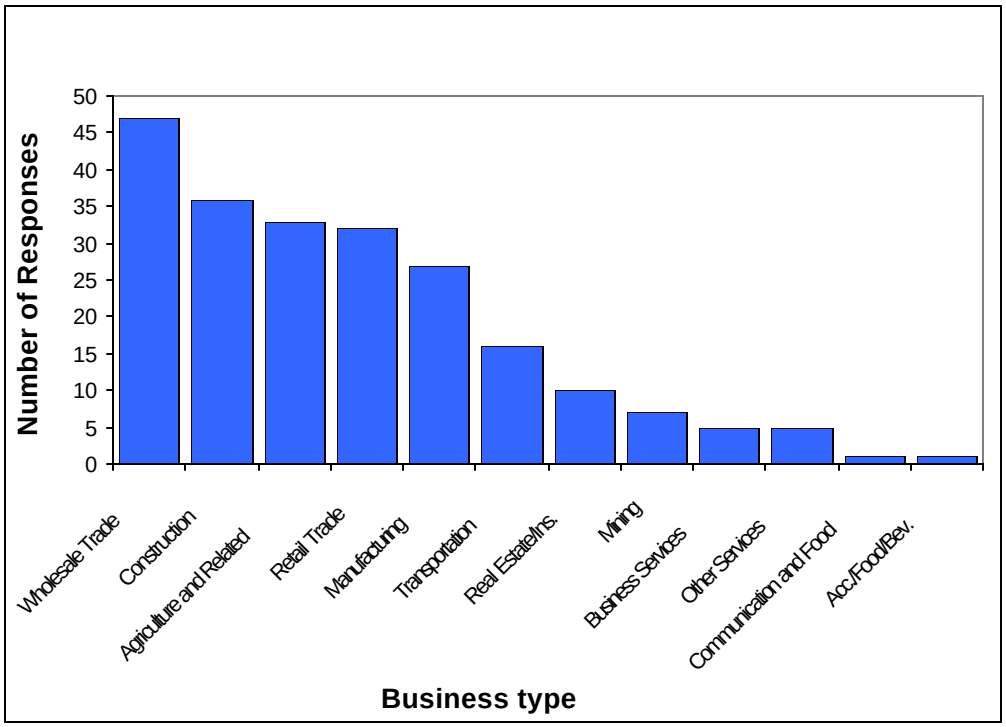
5.2.2.2 Characteristics of the Businesses Surveyed

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 surveyed businesses buy products and services from, and/or sell products and services to agricultural producers. It is important to note that these same "agriculture-related businesses" may also have trade with other sectors of the economy.

For the purpose of this study, the surveyed businesses were categorized according to their primary activity. This was done using a categorization method set out by Statistics Canada. Statistics Canada separates Canadian businesses into eighteen divisions or sectors, such as "Manufacturing", "Retail Trade" and "Agriculture and Related Service Industries".

As illustrated in Chart 7, this study surveyed businesses in twelve of these eighteen sectors. This suggests that the agriculture sector has links with almost every sector of the Huron County economy. Connections were found between agriculture and the following sectors: Mining, Manufacturing, Construction, Transportation, Communication, Wholesale Trade, Retail Trade, Real Estate and Insurance Agent Industries, Business Service Industries, Accommodation, Food and Beverage Industries, and "Other Service" Industries. Linkages were also found *among* businesses classified as Agriculture and Related Service Industries.

Chart 7: Response Rate by Business Type (for businesses surveyed)



Source: Agriculture-related business survey.

The study did not include businesses in the following sectors: Fishing and Trapping, Logging and Forestry, Finance, Government Service, Education, or Health and Social Service Industries. This does not necessarily mean that these industries are not linked to agriculture as they may sell to or buy from agriculture directly. In general, the service industries in this group support the workers and families in agriculture and related industries. More analysis of these particular industries may illustrate agricultural linkages.

Some of the industries analyzed in the study have comparatively stronger linkages with the agricultural sector. Of the total 220 businesses surveyed, high representation of agriculture-related businesses are found in manufacturing (27 businesses surveyed), construction (36), transportation (16), wholesale trade (47) and retail trade (31). Businesses within the agriculture sector are also making strong linkages with other businesses within that sector (32). Characteristics of the businesses surveyed in various sectors of the economy are discussed below.

i) Agriculture and Related Service Industries

The study found that strong linkages exist *between* businesses within the agriculture sector in Huron County. For example, both farms and nurseries are categorized as two types of agricultural producers. When a livestock farm provides manure to nurseries for their production of horticultural crops, a linkage has been made between two businesses in the agriculture sector.

More significant linkages are found between farmers and businesses that provide agricultural services. For example, veterinary offices and farm animal breeding specialists provide important inputs to livestock farms in Huron County. Linkages are also made with businesses providing agricultural crop services. These specialize in crop dusting and spraying, soil preparation, planting, and cultivating, harvesting, baling and threshing activities. Agriculture management and consulting services are also important inputs to the agriculture industry, but are not

represented in this study. In total, 32 businesses either producing agricultural products, or directly serving the agricultural sector, were surveyed in the county. A typical example is the Goderich Veterinary Clinic, which divides its time between large and small animals.

ii) Mining Industries

A number of businesses within the Huron County mining industry provide inputs used by the agriculture sector. Mining businesses such as sand and gravel pits provide aggregate for use on the farm. The second category includes a salt mining operation that provides salt for feed to livestock owners. Seven such businesses in the mining industry were included in the study. An example is Bothwell Ltd. in Dungannon.

iii) Manufacturing Industries

Huron County businesses manufacture a variety of products linked to the agriculture sector. A significant forward linkage involves agriculture products provided to the food industry for manufacture. Food industry activities in Huron County include abattoirs, bakeries, creameries, and the killing, dressing and packing of poultry products. An example of a non-food output from the agriculture sector is animal skins, which are used by tanneries in their production of leather goods.

The most important backward linkage between agriculture and the manufacturing sector is the production of farm machinery and farm equipment by businesses in Huron County. These and other Huron County manufacturing businesses are well represented in the study (27 surveys). An example is Promat in Seaforth, which produces mattresses for cattle.

iv) Construction Industries

The construction industry includes building, developing, general contracting and other establishments involved with the construction and development of commercial and residential buildings. Agricultural producers in Huron County use the construction industry for building water mains, sewers and drains on their farmland. They also require experts to drill or dig water wells, install and repair water well pumps and well piping systems. Other agriculture-related services provided by the construction industry include septic system installation, excavation and grading, and concrete pouring and finishing. There is also a large number of plumbing, heating and electrical businesses involved in the agriculture industry. Thirty-six construction industries with linkages to the agriculture sector were found in the county.

v) Transportation and Storage Industries

There are many transportation businesses linked to agriculture. These provide general freight, bulk liquids and dry material trucking. Typically, these involve local and long-distance trucking of livestock, manure and other agriculture products. Sixteen businesses were surveyed in this industry. An example is a transport company in Goderich that transports agricultural products locally as well as internationally.

vi) Communication Industries

Only one business in the communication industry was included the study. This business is a telephone carrier providing communication services to farm operations.

vii) Wholesale Trade Industries

There exist in Huron County a relatively large number of wholesale dealers providing inputs to the agriculture sector. A majority of these businesses sell farm supplies to farm operations and farm equipment dealers. Typically, this includes commodities such as machinery, equipment, feed, seeds and chemicals. Businesses dealing in new or used farm machinery, equipment, supplies, parts and repair are particularly well represented in the area. Examples include 21st Century Dairy Equipment in Walton and Becker Farm Equipment in Exeter.

viii) Retail Trade

Establishments included in the retail trade sector are primarily engaged in buying commodities for resale to the general public for personal or household consumption, and in providing related services such as installation and repair. These same businesses also sell products to farmers for use on the farm operation, but are classified as retail since their main activity is selling products for personal use. The strongest linkages between the retail and agriculture sector are found in automotive sales and service, including gasoline stations and motor vehicle repair shops. This industry is represented by 32 businesses in the study. DeJong Auto Repair in Brucefield is a typical business that sells and services farm vehicles.

ix) Insurance and Real Estate Agent Industries

Services provided by insurance and real estate agencies provide important inputs to the agriculture sector. The main agriculture-related activity of a real estate agent 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 to the farming community. Ten insurance and real estate agencies were surveyed for the study. Examples of businesses in this category include J.J. Talbot Realty in Goderich and West Wawanosh Mutual Fire Insurance Company in Dungannon.

x) Business Service Industries

Business service industries include accounting and law firms that provide financial and legal services to farm operations. Five such businesses were surveyed in the study.

xi) Accommodation, Food and Beverage Industries

Only one business in this category was involved in the study. This was a hotel that provides accommodation and other services to farm operators and their employees. The percentage of their total sales related to agriculture was, in fact, quite small.

xii) Other Service Industries

There are three important businesses with linkages to the agriculture industry included in the sector referred to by Statistics Canada as “Other Service Industries”. These include machinery and equipment rental and leasing businesses that provide important inputs to the agriculture sector. The second type of business with links to agriculture includes welding shops that repair farm machinery and equipment. Finally, auctioneers provide services for livestock and farm owners. Five such businesses were included in the study.

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 employees at the business. This provides an assessment all the economic activities of the business, regardless of whether or not they are related to agriculture. For example, a plumbing

and heating business may serve both residential and agriculture producing 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. Each business owner was asked to estimate the percentage of total gross sales that can be attributed to the agricultural sector. For example, if a business has $500,000 in total gross sales per year; and the owner estimates that 50 per cent of these sales are agriculture-related; then the total agriculture-related sales for that business would be $250,000.

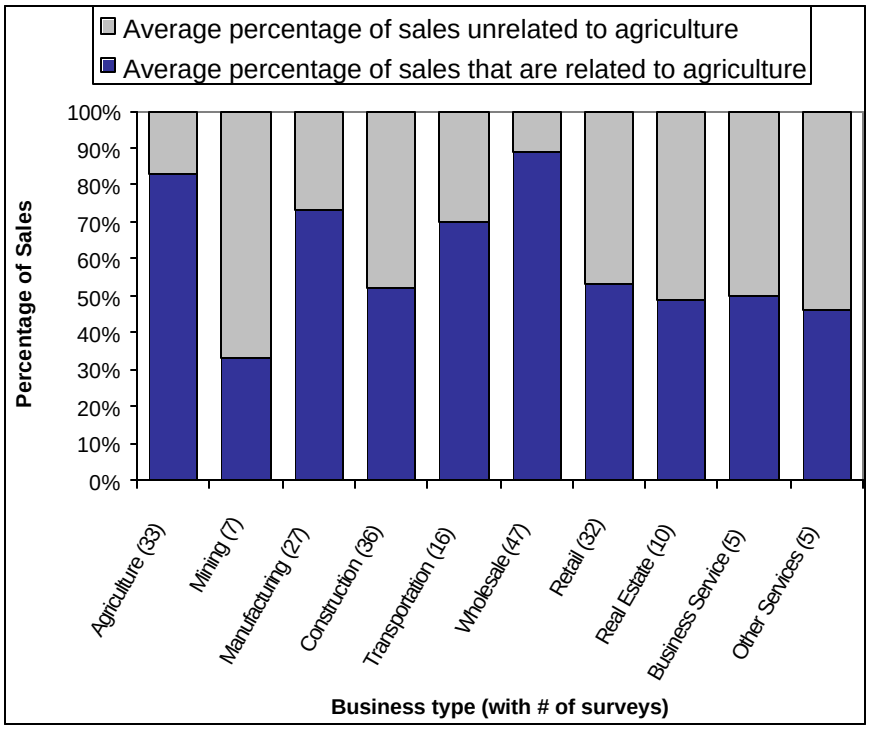
The importance of a business is also measured by number of full-time equivalent employees. This information was gathered for the business location, as well as the business outlets. An assumption of this study is that the percentage of sales related to agriculture is related to the percentage of employees working on agriculture-related activities. For example, if the plumbing and heating business mentioned above employed 20 people, it would be assumed that 10 people (50%) work on activities to provide goods and services to the agriculture sector.

Seventy percent of the businesses surveyed provided sales data (154 of the 220 businesses). Statistics Canada classifies a industry with less than $5 million in sales as a small business. A medium-sized business has sales between $5 and $25 million per year. Businesses with sales above $25 million are considered large.

By this classification, businesses related to agriculture in Huron County are generally small in size. Half of the businesses surveyed had sales under $500,000. This study found that agriculture-related businesses have a wide range of sales, with some very high sales. The average total gross sales for the 154 businesses that provided sales data are $4,240,865. Only one businesses had sales over 100 million, while the top quarter had sales over $1.7 million. The total gross sales for all businesses surveyed in the study, including sales related and unrelated to agriculture, was $653,093,350 for 1996.

On average, the businesses in the study attributed 67 per cent of their sales to the agricultural sector. The average agriculture-related sales for the 154 businesses surveyed are $3,498,067. Total agriculture-related sales for all the business surveyed in the study was $538,702,420 for 1996. There were a number of businesses with very high agriculture-related sales figures. One quarter of the businesses surveyed had agriculture-related sales over $1 million per year. Approximately half of all the businesses surveyed had agriculture-related sales below $200,000.

Chart 8: Percentage of Agriculture Related Sales According to Business Type (for businesses surveyed)



Source: Agriculture-related business survey.

i) Agriculture-Related Business in the Wholesale Industry

The study found that surveyed wholesale businesses providing goods and services to farmers are heavily dependent on the agriculture sector for their sales. The average total gross sales for the 37 wholesale businesses that provided financial information is slightly more that $3.1 million per year. Approximately $2.9 million or 88 per cent of these sales are attributed to the agricultural sector (refer to Chart 8 above). A typical wholesale business with a large percentage of agriculture-related sales is a farm machinery dealer.

ii) Agriculture-Related Business in the Manufacturing Industry

The manufacturing companies interviewed are also heavily influenced by the agriculture industry in Huron County. The average total gross sales for surveyed manufacturing businesses serving the agriculture community are $3.5 million per year. Approximately 70 per cent of these sales are attributed to the agriculture sector ($2.3 million). This information was derived from the twenty manufacturing companies that provided sales information for the survey.

iii) Agriculture-Related Business in the Transport Industry

Transport companies surveyed in Huron County depend on agriculture for 68 per cent of their Average total gross sales for these businesses is $3.4 million dollars, with average agriculture sales of $1.5 million for all the businesses surveyed (8). Liquid ammonia nitrate, bulls, cows, steers and weaner pigs are some of the examples of agriculture products shipped locally and exported by the trucking industry. This information is derived from the eight transport businesses surveyed for the study that provided sales data.

iv) Agriculture-Related Business in the Retail Industry

Retail stores typically sell products for household use, but, according to the 32 retail businesses surveyed, many also sell products to the agriculture industry. Approximately 50 per cent of the sales of the retail businesses surveyed are agriculture-related. Average gross sales for the 21 businesses surveyed are $2.6 million per year, with agriculture-related sales averaging $1.3 million.

v) Agriculture-Related Business in the Agriculture and Related Services Industry

Average gross sales for the surveyed agriculture and related services businesses are $1.5 million per year. In fact, the average sales for these industries are an unreliable way to understand the nature of most of the businesses in this sector. This is because the average is greatly affected by a couple industries with very large sales. Approximately forty percent of these businesses have sales less than $500,000.

While it may at first seem odd that only 82 per cent of the total sales of the surveyed agriculture and related service businesses are agriculture-related, this can be explained through a closer analysis of the businesses involved. This sector includes farms, as well as businesses that provide services to farmers. The primary activities of these businesses are agriculture-related, and they are categorized accordingly, but part of their sales may also be attributed to other sectors of the economy. An example is a veterinary clinic, which, while it may specialize in large animals, may also offer services to urban pet owners. Information was collected from 21 businesses categorized as agriculture or related industries that provided financial data.

vi) Agriculture-Related Business in the Construction Industry

Half of all sales for businesses surveyed in the construction industry are related to agriculture. Average sales are $1 million for the businesses surveyed in 1996. Agriculture-related sales reach $460,000 per year. Plumbing, heating and electrical businesses in the survey were particularly linked to agriculture. This is based on information provided by the 25 construction companies that provided financial data in the study.

vii) Agriculture-Related Business in the Mining Industry

The average sales for businesses surveyed in the mining industry is $600,000 per year. Thirty percent of this amount can be attributed to the agriculture industry. It must be noted that only four businesses were surveyed in this industry, and these concentrated only in the salt mining and sand and gravel pit industries.

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

Average sales for surveyed real estate and insurance businesses involved with the agriculture industry in Huron County are $3.8 million per year, with 47 per cent of these sales related to agriculture. Agencies with both high agriculture-related sales and very little agriculture-related sales were included in the study. Eight real estate and insurance companies provided financial data for the survey.

ix) Agriculture-Related Business in the Business Service Industry

The business service industry includes legal and accounting agencies. There was an average of $98,000 in sales for businesses surveyed in this sector, with approximately 48 per cent related to agriculture. Four businesses were surveyed in this category.

x) Agriculture-Related Business in "Other Service Industries"

The category referred to as "Other Service Industries" include 4 surveyed businesses offering machinery and equipment leasing, welding and auctioning services. Average gross sales for this industry are $270,000. Forty-four percent of these sales are related to agriculture.

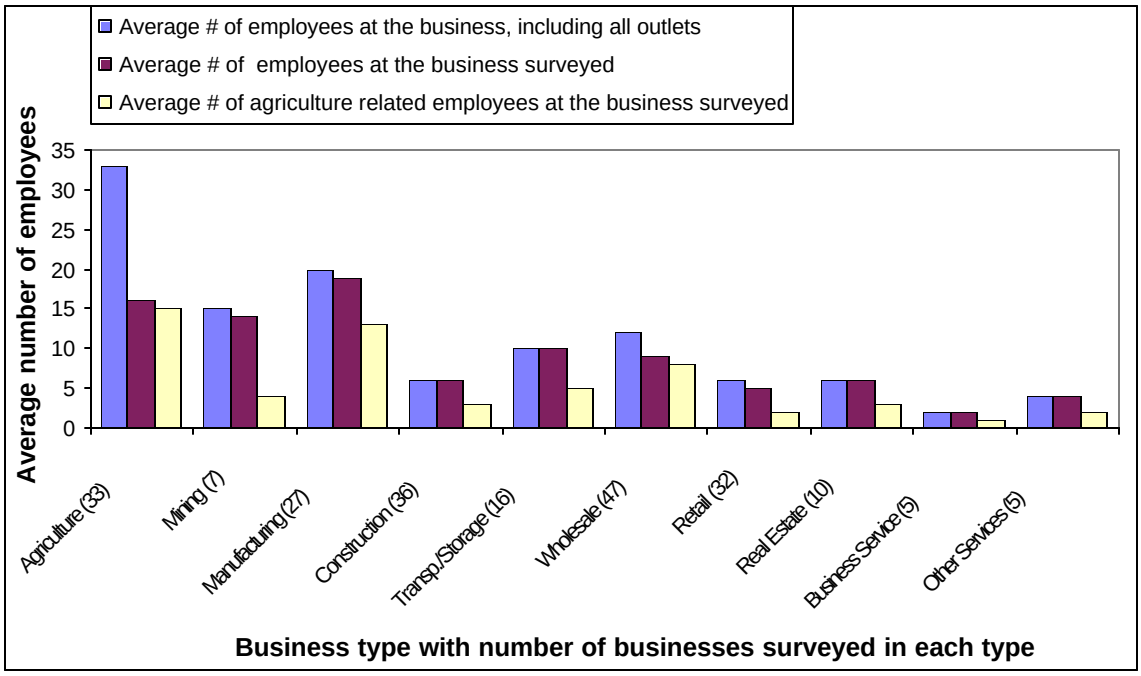
b) Employment for Agriculture-Related Businesses Surveyed

The number of full-time employees in a business is an 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, 97 per cent of the agriculture-related businesses in the study are small. The average number of employees for the businesses surveyed is ten. (This does not include employees in outlets.) While this average is meaningful, it should be noted that half of the businesses surveyed have between one and four employees, and 75 per cent of the businesses have less than nine employees. The range of employees per business is from one to 305 people.

Chart 9 shows that high numbers of employees are concentrated in agriculture and related service industries, manufacturing and mining for the businesses surveyed. Specifically, the average number of employees for the twenty-seven manufacturing businesses surveyed is nineteen. The average number of employees in the agriculture and related services industry is 16 people per business (based on 33 surveys). The average number of employees for the seven mining industries in the study is fourteen.

Chart 9: Average Number of Employees by Business Type (for businesses surveyed)



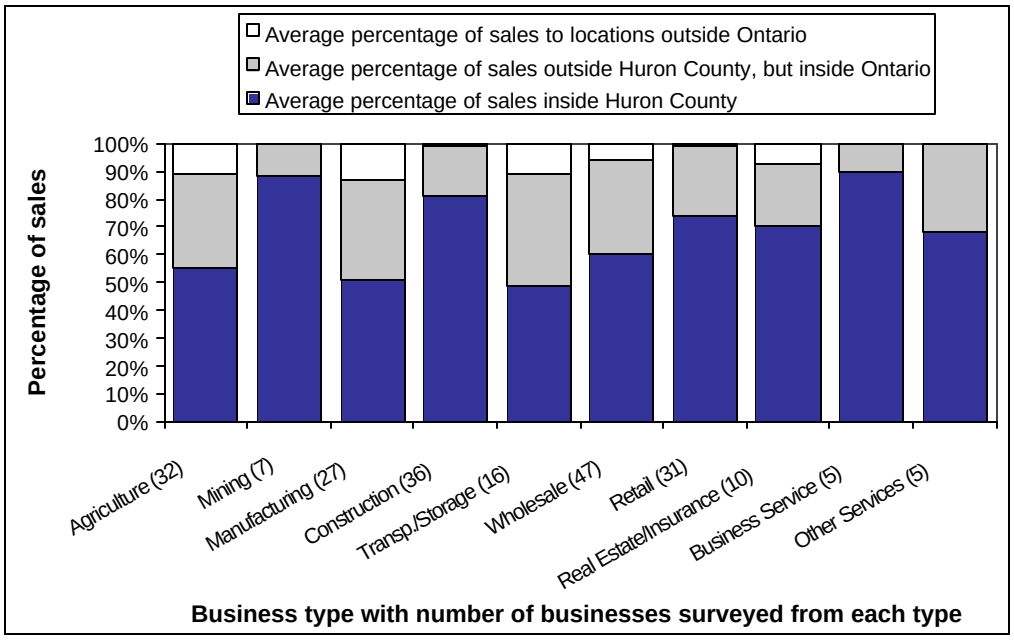
Source: Agriculture-related business survey.

All of the businesses in the study exchange goods and services with the agriculture sector. It is assumed that each of these businesses have employees working either full time or part time on activities to serve the agricultural sector. More than half of the businesses surveyed had at least two employees working on agriculture-related activities.

5.2.2.4 Exports of Agriculture-Related Businesses Surveyed

According to the 220 businesses surveyed in the study, 35 per cent of their sales are exported outside Huron County. In total, 65 per cent of the sales are retained inside the county, 29 per cent of the sales are exported to locations in Ontario (except Huron County), and 6 per cent are exported outside Ontario. These sales include sales related to and unrelated to agriculture, but are the total sales for all agriculture-related businesses surveyed.

Chart 10: Location of Sales by Business Type (for businesses surveyed)



Source: Agriculture-related business survey.

As can be seen in Chart 10, agriculture and related service businesses export 35 per cent of their goods and services to locations outside Huron County, but inside Ontario. Ten percent are exported to locations outside Ontario. The businesses surveyed in the mining industry export 11 per cent of their products and services to locations outside Huron County. Manufacturing businesses in the survey export half of their sales to locations outside Huron County, with 13 per cent going to locations outside Ontario. Surveyed construction businesses located in Huron County generate 19 per cent of their sales outside the borders of Huron. Transportation businesses in the survey have export sales of 50 per cent. Wholesale businesses in the survey export 40 per cent of their sales outside Huron. Retail businesses surveyed export 26 per cent of their sales outside Huron, but mostly inside Ontario. Seventy percent of the sales for the real estate and insurance businesses in the survey are generated inside Huron County. Business service industries in the survey such as accounting and law firms working in agriculture export only 10 per cent of their sales outside Huron. Other service industries, such as welding companies and auctioneers, have 32 per cent of their sales exported.

5.2.2.5 Summary: Agriculture-Related Businesses in Huron County

The analysis shows that businesses that buy from or sell to agriculture in Huron County generate a sizable amount of money and jobs inside Huron County. Furthermore, for both employment and income, Huron County companies generate flows of income and expenditure outside the county. It is estimated that $1.5 billion in agriculture-related sales generated in Huron County by agriculture-related businesses. These businesses generated $1.2 billion in agriculture-related sales in other parts of Ontario and a further $785 million outside Ontario. This income is exchanged among the three regions (inside Huron County, outside

Huron County but inside Ontario, and outside Ontario), which benefits local businesses. The total amount of agriculture-related sales for all three regions is $3.5 billion

Businesses supported by agriculture generate additional sales in other sectors of the economy. Total sales of agriculture-related businesses in Huron County reach $3.7 billion, including sales related and unrelated to agriculture. This is shown in Table 8.

Table 8: Gross Sales Generated by All Huron County Agriculturally Related Businesses

Location of Sales	Agriculture-Related Sales	Total Sales (Unrelated and Related to Agriculture)
Sales in Huron County	1.5 billion	1.6 billion
Sales in Ontario (excluding Huron County)	1.2 billion	1.2 billion[6]
Sales outside Ontario	785 *million*	926 *million*
Total Sales	3.5 billion	3.7 billion

Source: Agriculture-related business survey.

Indirect employment is a further impact of the agriculture sector. There are approximately 12,000 indirect agriculture jobs created in Huron County by agriculture-related businesses. In addition, there are jobs supported outside Huron County by both Huron County residents purchasing from outside the county and by jobs in subsidiary locations of county businesses. This is seen in Table 9 which shows 2,058 jobs maintained by Huron County agriculture-related businesses located outside Huron County. These jobs are supported through sales inside and outside of the county and are important linkages for the Huron County economy. These businesses support an additional 4,873 jobs unrelated to agriculture. Total full time equivalent jobs created by agriculture-related businesses are approximately 19,000, including jobs related and unrelated to agriculture.

[6] Unrelated sales equal $25 million.

Table 9: Full Time Equivalent Indirect Jobs In Agriculture

Full time Equivalent Indirect Jobs for all Agriculture-Related Businesses in Huron County	Agriculture-Related Jobs	Total Jobs for all Agriculture-Related Businesses in Huron County
Jobs in Huron County	12,128	16,180
Jobs outside Huron County	2,058	2,879
Total Full Time Equivalent Jobs	14,186	19,059

Source: Agriculture-related business survey.

5.2.3 Estimated Induced Sales and Jobs

Induced agriculture impacts are the 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, Van Hoeve's calculations of the multipliers were used. Van Hoeve found that for every $1 of expenditure by farms in the dairy sector, 0.73 per cent were spent in the region (Van Hoeve, 1995, p. 100). If this was the case for Huron County, then $318 million of the $436 million in farm gate sales in 1991 would be spent in Huron County.

Induced jobs in Huron County refer to service sector jobs that are supported by services purchased by agriculture employees. To make the estimates of induced jobs, two primary agricultural townships were selected (Morris, McKillop). In Morris, agriculture is the largest sector with 315 jobs, while construction industries with 70 jobs in the second largest sector. In McKillop, there were 390 jobs in agriculture and 75 in manufacturing, the next largest sector. All basic sector or export oriented jobs were compared to all non-basic or service industry jobs using the 18 industrial sectors in the 1991 census. The following results were obtained. In McKillop, 83 per cent of basic jobs were in agriculture. The non-basic sector in McKillop included 434 jobs while agriculture could be said to support 360 jobs. This suggests that for each one hundred jobs in agriculture, 82 jobs in the induced sectors will be produced. For Morris Township, the relationship suggests that 72 induced jobs per 100 basic jobs in agriculture. From these figures, there are an estimated 3,528 induced jobs in Huron County created by direct agriculture employment.

5.2.4 Total Direct, Indirect and Induced Impacts

There are 4,428 direct, 12,128 indirect and 3,528 induced jobs created as a result of the agriculture sector in Huron County (direct figure is an estimate for 1996). Thus, farm operations, businesses they buy from and sell to, and services that support farmers and farm businesses are estimated to support approximately 20,000 jobs. In addition, there are $512 million in direct and $1.5 billion in indirect sales associated with agriculture in Huron County. Therefore, approximately $2 billion in agriculture-related sales are generated in the economy.

5.3 Economic Base Analysis Results

The economic base analysis of the eighteen employment sectors in the 1991 Population Census of Canada data for Huron County identified the base multiplier and the base ratio for Huron County. This analysis used the location quotient as well as assumptions about local industry to determine the basic and non-basic components. Thus, the location quotient is discussed before the economic base analysis.

Recall that a location quotient (LQ) value greater than one indicates a greater level of specialization in the region than the reference region in the sector, and a LQ less than one indicates a lower rate of employment in the study region compared to the reference region in the study sector. In this analysis, the reference region was the province of Ontario and the study region was Huron County.

The sectors where the LQ indicated a greater ratio of employment over the province of Ontario (LQ>1) were agriculture (6.42), fishing and trapping (2.3), mining (2.23), construction (1.16), health and social services (1.14), and wholesale trade (1.03). The other sectors have LQ's under one with employment below the provincial average. These sectors include accommodation (0.98), logging and forestry (0.97), manufacturing (0.91), retail trade (0.90), transportation (0.87), other services (0.77), education (0.73), government (0.71), communication (0.68), real estate (0.56), finance (0.50), and business services (0.38). In analyzing the LQ, it is important to compare the magnitude of the number relative to one.

Huron County is one of the better agriculture producing counties in the province (Huron County, 1991, p.7). Therefore, it is no surprise that the LQ was greater than one. The fishing and trapping industry also had a LQ greater than one. This industry is also mainly for export, as is the mining industry which exports both salt and aggregates out of the county. The construction sector is on the rise in the county with the increase of tourism-related construction such as cottages along the lake (Dahms, 1982, p.22). The health and social service sector also had an LQ greater that one, indicating a higher degree of employment in that sector for Huron County than in the province of Ontario. The wholesale sector was the final sector with a higher employment rate than the wholesale sector in the province as a whole. This is most likely accounted for by the agri-related industry. This can be seen in Tables 10 through 13.

The economic base calculations were predicted on a combination of the L and assumptions made from local knowledge of the economy. In this method, the sectors of agriculture, fishing and trapping logging and forestry, mining and manufacturing were classified as basic. This assumption has been made based on the exporting nature of the sectors as a whole. Local knowledge indicates that manufacturing, mining and agriculture all export their products outside the county. The products of forestry and fishing are also exported from Huron County.

The results of the LQ on the eighteen sectors demonstrated that twelve of the eighteen sectors had a LQ of less than one. However, there are certain points that indicated to the researcher that not all of these sectors should fall in the non-basic component of the economy. For instance, the manufacturing industry (LQ=0.91) in Huron County produces road graders and salt for export. The logging and forestry (LQ=0.97) is also a net exporter. As well, it is unrealistic to assume that the 59,065 people in Huron County could consume all the manufactured production from the county. For this reason, the manufacturing and forestry sector were included in the basic component.

The LQ was used to determine the remaining components of the basic sector. This was found by calculating the LQ for the remaining sectors of the economy and using the basic calculations for each sector with an LQ greater than one. This yielded three additional sectors where part of the employment is to be included in the basic component. Only the basic employment for these sectors was used to provide the overall basic component for Huron County. In Huron County, only three sectors had LQ's greater than one, indicating they were more specialized than the province in the sector and potential exporters were assumed to produce solely for local consumption because they had LQ's less than one.

The economic base analysis that provided estimates of employment for the eighteen sector 1991 census employment data have been classified into basic and non-basic employment. Basic sector employment includes the entire sectors of agriculture and related sectors (4,845), fishing and trapping (25), logging and forestry (75), mining (425), manufacturing (790). As well, parts of construction (318), wholesale trade (39), and health and social services (356) sectors have been included because their LQ were greater than one. Only the portion of the employment calculated as basic has been included in the basic component. The non-basic sectors are transportation and storage (905), communication and utilities (710), retail trade (3,505), finance and insurance (705), government (1,620), real estate and insurance (310), business services (765), educational service (1,475), accommodation, food and beverage (1,750), and other services (1,515). Non-basic employment was in retail (3,115), health (2,359), and accommodation (1,714). The highest basic employment was in business services (765), education (546), and other services (453). These data can be seen in Tables 10 through 13.

Table 10: Economic Base Analysis Results: Calculated for Sectors with Location Quotients >1

			LQ	Basic	Non-Basic
	All Industries	Construction			
Ontario	**5,435,850**	358,890		Basic	Basic
Huron County	**30,095**	2,305	1.16	318	1,987
	All Industries	Wholesale Trade			
Ontario	**5,435,850**	233,915		Basic	Basic
Huron County	**30,095**	1,335	1.03	39	1,296
	All Industries	Health and Social Services			
Ontario	**5,435,850**	475,115		Basic	Basic
Huron County	**30,095**	2,895	1.14	356	2,539

Table 11: Economic Base Analysis Results: Sectors Assumed as Basic

			LQ	Basic	Non-Basic
	All Industries	Agriculture and related services			
Ontario	**5,435,850**	139,880		Basic	Basic
Huron County	**30,095**	4,845	6.42	4,845	0
	All Industries	Fishing and trapping			
Ontario	**5,435,850**	1,965		Basic	Basic
Huron County	**30,095**	25	2.3	25	0
	All Industries	Logging and forestry industries			
Ontario	**5,435,850**	13,965		Basic	Basic
Huron County	**30,095**	75	0.97	75	0
	All Industries	Mining (milling), quarrying and oil wells			
Ontario	**5,435,850**	35,355		Basic	Basic
Huron County	**30,095**	425	2.23	425	0
	All Industries	Manufacturing			
Ontario	**5,435,850**	942,995		Basic	Basic
Huron County	**30,095**	4,790	0.91	4,790	0

Table 12: Economic Base Analysis Results: Non-basic Calculated for Sectors with Location Quotient<1

			LQ	Basic	Non-Basic
	All Industries	Transportation / storage industries			
Ontario	**5,435,850**	187,830		Basic	Basic
Huron County	**30,095**	905	0.87	0	905
	All Industries	Communication / utility industries			
Ontario	**5,435,850**	188,630		Basic	Basic
Huron County	**30,095**	710	0.68	0	710
	All Industries	Retail Trade			
Ontario	**5,435,850**	700,925		Basic	Basic
Huron County	**30,095**	3,505	0.90	0	3,505
	All Industries	Finance and Insurance			
Ontario	**5,435,850**	253,135		Basic	Basic
Huron County	**30,095**	705	0.50	0	705
	All Industries	Government service			
Ontario	**5,435,850**	411,450		Basic	Basic
Huron County	**30,095**	1,620	0.71	0	1,620
	All Industries	Real estate / Insurance agent			
Ontario	**5,435,850**	100,090		Basic	Basic
Huron County	**30,095**	310	0.56	0	310
	All Industries	Business service			
Ontario	**5,435,850**	367,200		Basic	Basic
Huron County	**30,095**	765	0.38	0	765
	All Industries	Educational service			
Ontario	**5,435,850**	365,235		Basic	Basic
Huron County	**30,095**	1,475	0.73	0	1,475
	All Industries	Accommodation, food and beverage service			
Ontario	**5,435,850**	322,955		Basic	Basic
Huron County	**30,095**	1,750	0.98	0	1,750
	All Industries	Other service			
Ontario	**5,435,850**	355,310		Basic	Basic
Huron County	**30,095**	1,515	0.77	0	1,515

Table 13: Total Basic and Non-basic Employment

	Basic	Non-basic
Totals	10,873	19,222

The calculations for the base ratio and the base multiplier require the determination of the basic and non-basic components. The economic base multiplier (EBM) is calculated by simply dividing the total employment by the basic employment. The formula is shown in equation 1. The economic base ratio (EBR) is calculated by dividing the basic by the non-basic. These two calculations were made using the basic value of 10,873 and the non-basic value of 19,222. Thus, the economic base multiplier is 2.77 (30,095/10,873) while the economic base ratio is 1.76 (19,222/10,873).

Equation 1: Formulas for the Economic Base Ratio and the Economic Base Multiplier

EBR = Non-basic / Basic	EBM = Total employment / Basic employment

Source: Bendavid-Val, 1991,p.78.

The economic base analysis demonstrated the overall impact of the combined exporting industries on the county. Combined, industries in agriculture, fishing and trapping, forestry, mining, manufacturing as well as construction, wholesale trade, and health and social services, support 19,222 jobs in the non-basic sector. Overall then, the base multiplier is 2.77 and the base ratio is 1.76. This means that for every one job in the basic sector, 1.76 jobs are generated in the non-basic sector.

5.4 In-depth Analysis of Agriculture-Related Businesses: Case Studies

Twelve agriculture-related businesses were randomly selected from the total number of businesses that responded to the survey in 1996. An in-depth case study of these businesses was completed. This analysis focused on the backward and forward linkages of agriculture-related businesses in Huron County. These linkages refer to the products and services sold by the business (forward linkages) and the products and services purchased for the operation of the business (backward linkages). The linkages and interactions with the agriculture sector were highlighted. The in-depth analysis also involved collecting information on the value of sales and the number and type of employees. The analysis also attempted to identify the changing nature of the agriculture sector and the impact of this change on agriculture-related businesses. Discussed below are a number of similarities and recurring issues between these businesses.

The primary result of this analysis was to emphasize the wide range of activities linked to agriculture. For example, the random sample of twelve agriculture-related businesses included typical agriculture-related activities such as feed and supply stores and veterinary clinics, but also included; a real estate agency; a plumbing and heating business; a water drilling company; a vehicle dealership; a communications cooperative; a transportation company and an air compression service operation.

Most of the agriculture-related businesses interviewed sell products and services to both the agriculture sector and other sectors in the economy. The owner of a plumbing and heating company indicated that approximately 10 per cent of his total gross sales could be attributed to agriculture. The products and services provided by the business include the sale, installation and repair of plumbing fixtures to both residential and commercial businesses. This includes pumps and waterlines for barn water systems. The business also sells and installs heating systems, including natural gas and oil boilers, and hydraulic systems. The business also provides other services and products not typically utilized by farmers. These include the sale, installation and repair of air conditioning systems, air changing systems, central vacuum systems, water conditioning systems, pumps (for sewage and wells), and fireplaces.

Many of the agriculture-related businesses surveyed are operated out of the home, such as a real estate agent. Another business owner, an air compressor specialist, works from the garage of his home located in an urban locale. He installs and repairs air compressor and high-pressure washers used in agriculture production. Other businesses interviewed operate in separate buildings, but on the same property as the residence. These include a plumbing and heating business and a water drilling operation. One owner noted that this saves on the costs of operating a business location, but some problems were noted. Often the house is used as office space, and the division between personal and business can become blurred. One of the businesses interviewed was a livestock transportation business operated by a husband and wife team. The business has been in the family for approximately 50 years and is located on the property on which the family lives. During the interview, which was conducted at the kitchen table, the interviewers noted the all-consuming nature of the business. Within the space of only a half an hour, an owner prepared a meal and answered five business calls, three employees came into the kitchen to ask the second owner a variety of questions, one employee worked on a computer in a small office which doubled as a laundry room and, finally, the house pets were fed. This hectic pace and melding of the personal and business aspects of their lives was discussed and the owners agreed that the business had "taken over their lives" to some extent.

A number of the business owners interviewed had another source of income other than the agriculture-related business. A number owned and operated farms. Many were also involved in community activities, such as local politics and agricultural and other lobby groups. Taken as a whole, those interviewed were extremely busy people both in their various businesses and in the community.

A husband and wife team operates more than half of the businesses interviewed. For example, the wife of the air compression specialist mentioned above does all of the bookwork for the business. A husband and wife team also jointly operates the livestock transportation company. A number of the businesses had other family members working for the company. In one case, a father owns a farm equipment and service operation and each of his two sons operates two separate parts of the business, (which are in fact two separate businesses). One of the sons works exclusively with the used parts service, while the other takes care of the new machinery being sold by the business.

Furthermore, almost a quarter of the businesses are family operations passed down over generations. For example, a real estate agent owns the same business his father owned since the late 1960s. The son took over the business in the late 1980s.

More than half of the business reported increased sales in 1996 over 1995. There is apparently a trend of growth of the businesses interviewed. Consequently, some of those interviewed are investing heavily in expansion. A feed and supply company, for example, recently added another building to the operation, one of three in the last decade. The owner stated that the growth is due to increased demand created by larger farm operations. As described above, there is a trend in Huron County, and beyond, toward a decrease in the number of farms and an increase in their size. The owner of the feed and supply company also reported that his operation is expanding geographically as well and an additional sales person has recently been hired to handle the new accounts.

Some of the agriculture-related businesses interviewed also reported an expansion in the type of business activities undertaken. This expansion is meant to meet the changing needs of agriculture. For example, a livestock transportation operation, established over 50 years ago, began as a local trucking business. Then, in the early 1990s, it became an international livestock trucking company. The owner stated during the interview that this expansion was an excellent decision as the success of the business has grown exponentially. He went further to state that "the choice is to grow or die in this day and age."

Another business expanding the number and types of services to support the agriculture sector is a water drilling company. The business offers services such as water well drilling and other types of drilling, installation of water lines and water systems, and water conditioning. Traditionally, drilling and water systems were services associated with agriculture, while the later product was purchased by residential and business locations. Over the last several years, however, the owner has had a number of contracts to install water conditioning systems in barns (i.e. swine) and stated that he believes this demand from the agricultural sector will grow. The owner also told the interviewer about the recent installation of a hydroponics system to heat the building of a large chicken operation. He is hopeful that there will be an increased demand in such systems since larger farm operations have the capital and need for such expensive and complex systems.

As suggested, these are sophisticated systems, and they illustrate the changing nature of the agriculture sector. As the owner suggests, "the farmer is specializing, and so must we." The specialization and expansion of farm operations, the amount of capital available to the agribusiness industry and large farm operators, and the growing sophistication of the farmer are combining to change the nature of agriculture and, at the same time, the nature of agriculture-related businesses.

One of the veterinarians interviewed, who has been in the business for several decades, noted this specialization of agriculture. He suggested that "twenty-five years ago, a typical farmer operated a diversified farm; ... he may have been growing some crops, and keeping cattle and pigs. That's just not typical today." What is typical is a large operator dealing in one product (i.e. swine). This veterinarian noted that, consequently, most large animal veterinarians in Huron County are experts in a certain farm animal and only work within their own specialty.

This veterinarian also suggested that, as farmers specialized in certain areas, they are becoming more skilled in these areas. The farmers themselves are becoming experts. For example, a large swine operator will have a large amount of knowledge and experience in the management of swine, and is less likely to call a vet when an animal is sick since he/she will know how to handle the situation. Thus, the role of the veterinarian has

changed accordingly. The vet interviewed stated that he goes on fewer farm visits today than in the past (since the 1970's). Twenty years ago he may have visited fifteen or more farms a day. Currently, he visits approximately four to five farms per day. The veterinarian adapts to the change by offering new services in demand, such as nutrient advice and formulation work. While on a regular health visit, this veterinarian will give animal nutrition advice and rations. He purchases these products wholesale and receives a commission from the company for each sale. He reported that this is a growing part of his business.

As can be seen in this example, a marked change in the agriculture business creates an equivalent change in the agriculture-related businesses associated with that business. Many of the interviewees noted an increased demand by the agriculture sector for personalized service. An example is an abattoir and meat market where the main activity is custom killing, which makes up 60 per cent of the total business sales. Farmers intending to resell their meat make up 50 per cent of this business. The owner estimated that 40 per cent of his total gross sales are agriculture-related as farmers are adding value to their livestock for non-personal use.

Increased demand for more complex and sophisticated products and services has entailed a more skilled and diverse labour force for the agriculture-related businesses interviewed. For example, the air compression specialist mentioned above has practiced his craft for more than 35 years. He installs and repairs air compressors and high-pressure washers. He has noticed an increase in the demand for his specialization in the last decade. He is over 70 years old and would like to retire, but the current demand for his expertise is significant. He continues to work at least one day a week.

Another interviewee noted that experienced employees are becoming more difficult to find. This interviewee has an international livestock trucking company. Business activities involves the transport of livestock such as bulls, cows, steers, sows, boars, fat hogs, wiener pigs, horses and liquid ammonia nitrate. There are a total of seventeen livestock tractor-trailers (i.e. fourteen 50 feet long and three 53 feet long). There are four liquid tanks for the fertilizer transport. Along with the two owners, there are from twenty to twenty-five employees at any given time. There are mechanics, secretaries, trailer washers, pig sorters and drivers. There are also a number of brokers working for the business.

All of the employees at this business were hired within Huron County, although the owner expressed concern that this is becoming more and more difficult. He complained that there is a shortage of trained drivers who know how to deal with livestock. He suggests this be due to the fact that "the farming industry is changing so much, and all the young guys on the farm are leaving for city jobs."

The result of the interviews was to highlight certain trends in agriculture-related businesses sector in Huron County. The most significant finding was the linkages created by agriculture through agriculture-related businesses. These linkages illustrate the interconnectedness of agriculture with the rest of the Huron County economy.

6.0 Results Conclusions

The total impact of the agriculture sector in Huron County is estimated above. From this we can see the magnitude of the agricultural sector in Huron County. Agriculture generates substantial sales volume throughout

the economy. In fact, in 1991, Huron County produced more farm gate sales than four provinces. This is significant considering that the county population is only around 55,000.

Estimated expenditures of $2 billion are generated from agriculture producers and agriculture-related businesses within Huron County. This is the estimated total flow of sales and expenditure generated by farm operations as well as sales related to the agricultural sector. While estimates indicate that 4,428 jobs existed in the agriculture sector in 1996, a further estimation of 12,128 jobs were tied indirectly to the agriculture sector in Huron County through expenditures by agriculture-related businesses. Clearly this has a significant impact on the Huron County economy.

7.0 Discussion and Recommendations

Given the trend of declining primary employment, it would seem natural to focus economic development and planning into industries that nurture business opportunities in other sectors. However, declining primary and manufacturing employment is not necessarily a death knell to these industries. As Kulshreshtha (1988, p. 432) noted, the indirect benefits of primary sectors are often more important than the direct impacts. This is the case in Huron County, where substantially more employment was identified as agriculture-related than in direct agriculture. This is something planning practitioners should bear in mind while evaluating future development in the county.

In the larger economy, there has been a steady decline of the primary and manufacturing sectors and an increase in the services sector. Because of the decline in primary and manufacturing sectors, planners have placed their emphasis on economic diversification (Troughton, 1992, p. 39). This is despite research that proves that the impacts of the primary activities are often under-estimated due to a lack of investigation of the indirect and induced impacts of the sectors (Kulshreshtha, 1988, p. 432). Signs such as the continued rise in the value of agricultural gate sales and the size of indirect employment indicate that the agriculture sector is not necessarily on the decline, but merely shifting its focus from production to providing services.

In Huron County, the decline of the primary and manufacturing sectors was combined with an accompanying shift of employment focus to the service sectors. The two trends do not occur in isolation of one another and are in fact related. The economy may be more service based, but it still needs base industries to provide services to. For example, the types of businesses related to the agriculture sector include farm machinery and equipment wholesalers, general freight and trucking, building development and construction, insurance and real estate, veterinary services, services such as accounting, as well as garages and other types of general repair. This indicates the inter-relatedness of the entire economy. While Statistics Canada subdivides these activities into individual sectors for the Population Census of Canada, all of these provide services to the agriculture sector and are indeed the agriculture-related businesses of the Huron County case study.

In Huron County, agriculture continues its strong role. While the numbers of direct agriculture jobs are down, the overall numbers including agriculture-related jobs are quite strong. Therefore, the first recommendation for Huron County is to continue to review planning and economic development policies to guarantee the continued support of agriculture and other primary sectors in the county. The second recommendation is to provide new policies that nurture and encourage new economic activity in the county. This

policy should not preclude the further development of existing industries, nor focus on any one particular industry over others.

Although these recommendations run contrary to the provincial and national trends, they are based in Huron County's unusual situation of consistently strong agriculture sector performance. Huron County's entrenched agriculture system with large agriculture-related employment indicates that the sector will remain a vital component of Huron County's overall economy. Planners, stakeholders, and decision-makers in Huron County are recognizing this fact. This research provides a well-documented analysis that indicates that Huron County's strengths lie in the agriculture sector with significant direct, indirect and induced employment. This sector, along with the other basic sectors of manufacturing, mining, forestry and logging, fishing and trapping, and the support sectors such as health, social services and wholesale services, provides an excellent basis for much of the rest of the economy. The future of the agriculture sector therefore lies in continued development of the "agriculture and related" industries.

As stated, the researchers believe strongly that new employment and economic opportunities can be found within and related to the agriculture sector. This belief does not dictate that the sector should be the sole interest for the future of the county. The potential for agriculture services to decline is a constant concern especially as the trend to greater agribusiness control of farms and declining farm numbers exists. Indeed, it has been the services sector that has provided the bulk of employment growth in the county, including the agriculture sector. However, it must be remembered that these services require base industries such as the agriculture and other primary sectors to support them. Therefore, these recommendations have been created stressing the need for a base sector to drive the service sector.

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Appendices

Appendix 1: Table 17: Values for Charts 3 and 4, Huron County and Ontario Farms Classified by Major Product, 1991

Appendix 2: Survey for Agriculture-Related Businesses

Appendix 3: Technical Appendix to Indirect Impact Assessment Methodology

Appendix 1: Values for Charts 3 and 4: Huron County and Ontario Farms Classified by Major Product, 1991 (farms with sales > $2,500)

Number of Farms	Dairy	Beef	Pigs	Poultry	Field Crops	Fruit & Veg.	Misc. Speciality	Total
Huron	432	791	490	152	934	44	291	3134
% of County Farms	13.8	25.2	15.6	4.9	29.8	1.4	9.3	100
Ontario	9757	16855	3827	1583	15497	3746	10167	61432
% of Ontario Farms	15.9	27.4	6.2	2.6	25.2	6.1	16.6	100

Miscellaneous crops include, among other, garlic and sunflowers.
Source: OMAFRA, 1995, p. 31.

Appendix 2: Survey for Agriculture-Related Businesses

1. Business number: ___.
2. Subject's position? _____.
3. Where is this business located?
   Town?_____.
   County?_____.
4. What services or products does this business provide for the agriculture sector? What is the importance of this product to your business?

Service or Product	Importance as % of Annual Sales
1.	
2.	
3.	
4.	
5.	

5. Is there more than one outlet of this business (y/n): Where?
   In Huron County?_____.
   Number outside Huron County?_____.
   Where?_____.
   (Identify the location(s) by town.)

6. The next question deals with the number of employees in the business by full and part time as well as seasonal employees. Could you please answer this by number of employees.

   Location No.1 Full-time employees?_____.
   Part-time employees?_____. # of weeks/year?_____.
   Seasonal employees?_____. # of weeks/year?_____.
   Location No.2 Full-time employees?_____.
   Part-time employees?_____. # of weeks/year?_____.
   Seasonal employees?_____. # of weeks/year?_____.
   Location No.3 Full-time employees?_____.
   Part-time employees?_____. # of weeks/year?_____.
   Seasonal employees?_____. # of weeks/year?_____.
   Location No.4 Full-time employees?_____.
   Part-time employees?_____. # of weeks/year?_____.
   Seasonal employees?_____. # of weeks/year?_____.
   Location No.5 Full-time employees?_____.
   Part-time employees?_____. # of weeks/year?_____.
   Seasonal employees?_____. # of weeks/year?_____.

7. What per cent of your total sales are related to the agriculture sector? _____%

8. Please identify the value of expenses used by this business $_____. Could you suggest what percentage of your expenses are in the following categories?

	Expense	Percentage	Location Spent
1.	**Cost of doing business** Advertising Business tax/fees Transportation Maintenance and repairs Office expenses Property/rent Salaries, wages, benefits		
2.	**Wholesale** Product for resale Raw materials, goods in process, finished product		

(Inside Huron County = 1, Outside Huron County = 2, Outside Ontario = 3)

9. The previous questions have dealt with expenses into this company's production. I would now like to shift to the other side of the equation which is sales. Could you identify the value of sales produced by this company in the previous year for your agriculture-related business? $_____.

   Could you now identify what percentage of your total sales would be agriculture-related?_____.

10. Continuing on the same topic, in order to estimate the full value of agriculture in Huron County, we need to know the location where sales were sold. Could you now estimate the percentage of your agriculture related sales carried out:

    Inside Huron County?_____%
    Outside Huron County?_____%
    Outside Ontario?_____%

11. We are now at the end of the questionnaire. Are there any comments which you would like to make about the subject of agriculture related business in Huron County?

Appendix 3: Technical Appendix to Indirect Impact Assessment Methodology

Indirect Impact Methodology

The indirect impact methodology was based on an "input-output-like" approach using a telephone survey completed in 1996. Questions focused on the sales and employment for agriculturally related businesses in Huron County. The study continued in 1997 with in-depth interviews conducted with some of the same businesses phoned the prior year. The study of these sampled businesses provided an estimate of the economic impact of agriculture-related businesses for the county (indirect employment and sales.)

The following is a detailed discussion of the exact methodology used in the indirect impact study. A handbook on the methodology of measuring the economic impact of agriculture is also available from the authors.

Development and Verification of the Survey Sample

The survey was based on a random sample of businesses from a list of agriculture-related businesses provided by Huron County Federation of Agriculture directors. After verification, the final list of agriculture-related businesses had 448 entries. The survey asked the respondent to give information over the phone regarding employment and the value of sales related to the agriculture sector. Of the 220 businesses, all gave employment data and 154 provided data on the value of sales.

A concern of the researchers was the representativeness of the list of agriculture-related businesses. During the summer of 1997, further research was conducted in three municipalities in the county to verify the 1996 survey results. The three areas were Stanley and McKillop Townships and the Town of Wingham. Researchers visited each of these areas to establish a better estimate of the actual number of agriculture-related businesses within each municipality. Visual checking, the telephone directory, municipal tax rolls, business lists and key informants were utilized in this task.

The original estimations for the number of agriculture-related businesses in Stanley, McKillop and Wingham were 35, 38 and 30 respectively. After further study, the new estimation of agriculture-related businesses in McKillop, Stanley and Wingham were 52, 50 and 128 respectively. The researchers determined that the 1996 findings underestimated the number of agriculturally related businesses. Figures were therefore adjusted upwards.

As can be seen, the list made by the Huron County Federation of Agriculture directors was more accurate in the rural (i.e. Stanley and McKillop) municipalities than in the urban area (i.e. Wingham). It was therefore decided that any changes would need to be weighted according to the rural/urban difference. The multiplier[7] for the urban areas is taken from the Wingham example and remains at 4.27. The multiplier for the rural setting is devised by adding the Stanley and McKillop figures (73/102=1.4). Based on the addresses on the original list of agriculture-related businesses, 80 per cent of the businesses are rural and 20 per cent are urban. Therefore, the urban multiplier is .85 (.2 x 4.27= .85). The rural multiplier was found to be .88 (.8x1.39x.8= .88).

[7] The factor used to multiply the original number of businesses by to get the final estimate.

For the entire population (80 per cent of the rural area plus 20 per cent of the urban area), the multiplier thus becomes 1.73 (.88+.85 =1.73).

This multiplier is used to estimate the actual number of agriculture businesses in Huron County. The number of businesses originally derived from the list developed by the HCFA directors (448) is increased using the multiplier found in the second year of the study (448x1.73=775). The new estimate for the number of agriculture-related businesses in Huron County is 775.

Verification of Sales and Employment Data through Long Interviews

Further analysis was also completed in 1997 on the accuracy of the sales and employment data collected in 1996. Intensive personal interviews with twelve owners of agriculture-related businesses who responded to the phone interview in 1996 were conducted. During the interview the respondents were asked to divulge their businesses' total gross sales, the percentage of these sales associated with agriculture, and the number of employees for the year under study (1995). These numbers were then compared to the original data set collected in 1996 using the actual survey responses via the telephone. Findings from the interviews revealed that all sales and employment data was underestimated. The interviews provided the researcher with multipliers for the total gross sales (1.14), the percentage of sales related to agriculture (1.11), and the number of employees (1.82).

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. Also note that total gross sales are divided by the location of those sales. The businesses in the sample generate sales (i) inside Huron County, (ii) outside Huron County, but inside Ontario, and (iii) outside Ontario. The figures below reflect these divisions. The original estimate in 1996 for total gross sales remaining inside the county was $276 million for the 154 businesses surveyed. Using the multipliers regarding total gross sales (1.14) we arrive at a new estimate of $315 million (276x1.14=315) for the total gross sales remaining inside the county by the businesses surveyed.

The original estimate in 1996 for the total gross sales generated outside Huron County[8] by the businesses surveyed was $213 million. Using the multipliers derived above, researchers estimate that $243 million in sales was generated outside Huron County by the sample businesses (213x1.14=243).

The original 1996 estimate for total gross sales generated outside Ontario by the businesses surveyed was $161 million. The new estimate, using the multipliers, is $184 million (161x1.14=184) for the businesses surveyed.

Agriculture-Related Sales for the Businesses Surveyed

As stated, agriculture-related businesses in Huron County have sales both related and unrelated to agriculture. Researchers separated out the sales unrelated to agriculture to find agriculture-related sales generated inside Huron County, outside Huron County and outside Ontario.

[8] Sales outside Huron County, but inside Ontario.

The original 1996 estimate for agriculture-related sales generated inside Huron County was $234 million for the 154 businesses surveyed. Using the multipliers regarding the sales (1.14) and percentage of sales to agriculture (1.11), the new estimate for agriculture-related sales remaining inside Huron County is $296 million (234x1.14x1.11=296) for the businesses surveyed.

The original 1996 estimate for agriculture-related sales generated outside Huron, but inside Ontario, was $188 million for the businesses surveyed. Using the multipliers derived above, we can estimate that $238 million in agriculture-related sales was generated outside Huron County by the businesses sampled (188x1.14x1.11=238).

The original estimate for total gross sales generated outside Ontario was $123 million. The new estimate, using the multipliers, is $156 million (123x1.14.x1.11=156) in sales generated outside Ontario by the surveyed agriculture-related businesses. Details can be found in Table 14.

Table 14: Total Agriculture and Non-Agriculture Sales of Surveyed Businesses

Sales for Surveyed Agriculture-Related Businesses	Agriculture-Related Sales ($million)	Sales Unrelated to Agriculture ($million)	Total Sales for Surveyed Businesses ($million)
Sales in Huron County	296	19	315
Sales in other Ontario Counties	238	5	243
Sales outside Ontario	156	28	184
Total Sales	690	52	742

Source: Agriculture-related business survey.

Total Gross Sales for All Huron County Agriculture-Related Businesses

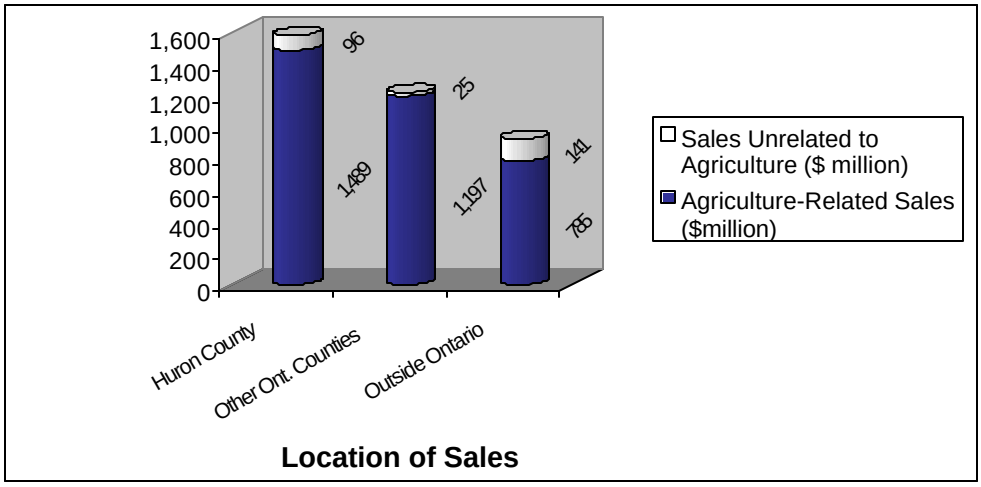
From the sample, estimates can be made regarding the total gross sales of all agriculture-related businesses in Huron County. These include sales both related to and unrelated to agriculture. We have already found that there are approximately 775 agriculture-related businesses in Huron County. A total of 154 of the businesses surveyed responded to the sales questions. This is approximately a 20 per cent sample. Therefore, a multiplier of 5.03 can be used to calculate the total gross sales of all the agriculture-related businesses in the county (775/154=5.03).

Taking the figures from the sampled businesses, researchers found that Huron County agriculture-related businesses generate $1.6 billion (315x5.03=1,585 million) in total gross sales inside Huron County. These are the total gross sales that are generated within the county. The total gross sales generated outside Huron County is approximately $1.2 billion (243x5.03=1,222 million). The total gross sales generated outside Ontario is approximately $926 million (184x5.03=926 million). It is important to note that these amounts include sales both unrelated and related to agriculture. Businesses in the study that buy products from, or sell products to, agricultural producers may also conduct business with other sectors of the economy. The figures above indicate total sales of all agriculture-related businesses in Huron County.

Agriculture-Related Sales for all Agriculture-Related Businesses in Huron County

Total agriculture-related sales for the entire county can be derived using estimates of the agriculture-related sales generated by the businesses surveyed. Approximately $1.5 billion (296x5.03=1,489 million) in agriculture-related sales is generated within Huron County by agriculture-related businesses. The total agriculture-related sales generated outside Huron County (but inside Ontario) is approximately $1.2 billion (238x5.03=1,197 million). The total agriculture-related sales generated outside Ontario is approximately $785 million (156x5.03=785 million). This is illustrated in Chart 11.

Chart 11: Total Agriculture and Non-Agriculture Sales by All Agriculturally Related Businesses in Huron County



Source: Agriculture-related business survey.

Number of Full Time Equivalent Employees Working at the Businesses Surveyed

The study separated employees at the agriculture-related businesses surveyed into two categories. The first are employees which work on activities related to the agriculture sector. There are also employees who work at businesses related to agriculture, but which do not serve the agriculture sector. For example, a veterinarian office may have four veterinarians specializing in large animals (agriculture-related employees) and one veterinarian specializing in small animals (unrelated to the agriculture sector). Data on both types of employee was collected in the study and the results are presented here.

The original 1996 estimate for the total employees working in the surveyed businesses was 2,540. The difference between the employment data collected in 1996 and the revised data collected in 1997 resulted in a multiplier of 1.82 (see above). Using the multiplier, the revised estimate for total full-time equivalent employees at the businesses surveyed is 4,623 (2,540x1.82=4,623). This total includes all employees of the businesses surveyed, regardless of whether or not they perform activities related to the agriculture sector. The full-time equivalent employees working within Huron County to serve the agriculture sector 3,465 (1,904x1.82=3,465) for the businesses surveyed.

The survey also illustrated that there are also jobs generated outside the county by Huron agriculture-related businesses. The total number of full-time equivalent jobs outside Huron County supported by the

businesses surveyed 823 (452x1.82=823). Of these, 588 are employed to service the agriculture sector (323x1.82=588) for the businesses surveyed.

Table 15: Full Time Equivalent Jobs at the Businesses Surveyed

Jobs at Agriculture-Related Businesses Surveyed	Jobs Related to Agriculture	Jobs Unrelated to Agriculture	Total Jobs at Businesses Surveyed
Jobs in Huron County	3,465	1,158	4,623
Jobs outside Huron County	588	235	823
Total Jobs	4,053	1,393	5,446

Source: Agriculture-related business survey.

Number of Full-Time Equivalent Employees Working in Agriculture-Related Businesses in Huron County

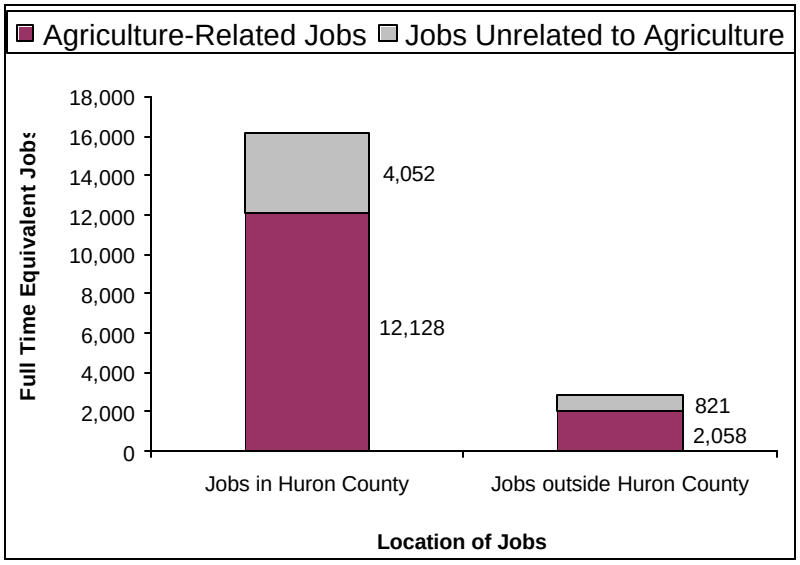
The total number of full-time equivalent jobs for all agriculture-related businesses, as well as the total full-time equivalent jobs that serve the agriculture sector can be derived from the sample. The number of respondents who provided employment data (220) was divided into the estimate of the number of agriculture-related businesses. This resulted in a value of 3.5 per responding firm (775/220=3.5). From these values, the total number of employees for all agriculture-related businesses in Huron County is 16,180 (4,623x3.5=16,180). Of these, the number of full-time equivalent employees working on activities to serve the agriculture sector is 12,128 (3,465x3.5=12,128). There are also jobs created outside Huron County by these businesses. The total number of jobs generated by these businesses outside Huron County is 2,879 (823x3.5=2,879). Of these, 2,058 work on activities related to the agricultural sector (588x3.5=2,058). A summary of these results can be found in section 5.0. Refer to Table 16 and Chart 12 on the following page for the actual figures and a visual display of this data.

Table 16: Full Time Equivalent Indirect Jobs in Huron County

Jobs for all Agriculture-Related Businesses in Huron County	Agriculture-Related Jobs[9]	Jobs Unrelated to Agriculture	Total Jobs for all Agriculture-Related Businesses in Huron County
Jobs in Huron County	12,128	4,052	16,180
Jobs outside Huron County	2,058	821	2,879
Total Full Time Equivalent Jobs	14,186	4,873	19,059

Source: Agriculture-related business survey.

Chart 12: Full Time Equivalent Indirect Jobs in Huron County



Source: Agriculture-related business survey.

[9] "Jobs" are full-time equivalent jobs.