GPI Atlantic

Genuine Progress Index for Atlantic Canada / Indice de progrès véritable - Atlantique

MEASURING SUSTAINABLE DEVELOPMENT

APPLICATION OF THE GENUINE PROGRESS INDEX TO NOVA SCOTIA

NOVA SCOTIA GPI SOILS AND AGRICULTURE ACCOUNTS: PART 2: RESOURCE CAPACITY AND USE SECTION 3: LAND CAPACITY

Prepared by:
Jennifer Scott, MES
July, 2008

EXECUTIVE SUMMARY

Farming and food production require a special combination of elements to be successful—including the best and most fertile available land; clustered farming communities; farming infrastructure nearby; people knowledgeable about farming and willing to take risks; financial resources; adequate water and stable climatic resources; and favourable market conditions.

This component of the GPI Soils and Agriculture Accounts examines one of these key factors of agricultural production in Nova Scotia—land capacity. The study explores the direct value of actual and potential agricultural land in Nova Scotia, as this is the most fundamental basis for agricultural productive capacity. Since most farming depends on good land to produce agricultural products, it is essential to take stock of what productive capacity is available before assessing the value of flows into and out of agriculture.

The basic questions we seek to answer in this analysis are:

- How much land appropriate for agriculture is available in Nova Scotia?
- What is its market value and productive value?
- How has this stock of land changed over time?

The three indicators of land resource capacity used in this analysis are (1) available farm land; (2) inherent soil quality; and (3) flexibility of land use.

Available Farm Land

Recent sharp rises in the price of fuel, global food price increases, and commodity price fluctuations due to storms, climate change, drought, and other events have led to renewed insecurity about our food supply and to interest in reducing dependence on imported food supplies that may be uncertain and subject to increasingly expensive transportation costs. These circumstances give new importance to the issue of land capacity examined in this report, and to the question of whether Nova Scotia has sufficient farm land to improve food self-reliance.

Physical account

Estimates of the land area suitable for crops and tame pasture in Nova Scotia range from a low of 138,000 ha (current land in crops and pasture) to a high of 1.6 million ha (including potentially suitable land not currently in crops and pasture). In the best estimate of this analysis, about 1.1 million ha of land is potentially appropriate for crops and pasture in Nova Scotia, if it has not already been converted irreversibly to other purposes. This represents 21% of Nova Scotia's total land area.

Monetary account

Direct valuation: The estimated market value and productive value of actual and potential farm land is presented in the table below.

Summary of Average Farm Land Value in Nova Scotia ($2007)

	Area (ha)	Average annual net productive value ($55/ha) * area	Estimated 2006 market value ($1,394/ha) * area
Current land in farms (2006)	403,044	22,167,420	561,873,300
Potential land suitable for crops and pasture (total of Class 2 and 3 land)	1,149,194	63,205,670	1,601,976,436

Inherent Soil Quality and Vulnerability

A high percentage of the land in Nova Scotia is sloped, while autumn to spring precipitation levels are generally high. These features of the landscape and climate limit agricultural potential in the province and increase risk of soil erosion. Thus, 84% of Nova Scotia's cultivated agricultural land (compared to just 13% in Canada as a whole) has been assessed as severely vulnerable to inherent risk of water erosion if it is left bare, indicating that it should be kept in pasture, hay, orchard, agroforestry, or other perennial cover options in order to avoid this serious risk. This reality limits agricultural options in Nova Scotia, has economic impacts, and requires Nova Scotian farmers to take extra care to maintain soil quality.

Some of the structural weaknesses of soils in Nova Scotia are naturally occurring, with the province's soils generally assessed as "inherently weakly structured, low in soil organic matter and nutrients, and acidic" (Acton and Gregorich, 1995:58). Other weaknesses (particularly compaction), however, are due to "[t]he use of heavy machinery on moist, fine-textured soils during the wet conditions of early spring and late fall [which] accelerates structural degradation" (Acton and Gregorich, 1995:58).

Structural weaknesses in the province's soils due to farming methods, as well as the effects and costs of soil erosion, are assessed in greater detail in a separate report in the GPI Atlantic Soils and Agriculture Accounts series (Soil Quality and Productivity), but are briefly referenced in this report because of their relevance to land resource capacity.

Flexibility of Land Use

Physical land flexibility (PLF) (Neave et al. 1995) is a measure of "the degree to which current yields in an area are approaching potential yields. It is also a measure of the degree of flexibility to buffer against outside stress. PLF reflects the ability of a region to diversify production, and its capability to withstand climatological and economic stress." This is an important indicator for Nova Scotia, because it focuses on strengths and opportunities, rather than limitations. The indicator can also highlight the resilience of Nova Scotia agriculture in the face of many stresses.

Although data for this indicator are not presently available for Nova Scotia, they might indicate that the potential area available for farming and the consequent value of unused farm land are even greater than estimated above. For these reasons, it is recommended that this indicator be developed in the future and that appropriate data be collected in this area.

ACKNOWLEDGEMENTS

GPI*Atlantic* gratefully acknowledges funding for this study provided by the Nova Scotia Department of Agriculture and Fisheries, the Rural Secretariat / Canadian Rural Partnership, the Organic Agriculture Centre of Canada, the Alerce Fund, and Susan and Bill van Iterson.

A sincere and special thank you is extended to those who kindly reviewed the text and made constructive suggestions: Dr. Ronald Colman, executive director, GPI Atlantic; Gary Patterson, soil specialist, Agriculture and Agri-Food Canada; Dr. David Patriquin, Faculty of Biology, Dalhousie University; Linda Best; and Pierre Cloutier. Thanks are also extended to Nancy Hofmann and Barbara McLaughlan, Statistics Canada.

Needless to say, any errors or misinterpretations, and all viewpoints, findings, and conclusions expressed, are the sole responsibility of the authors and GPI Atlantic.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

GPI	Genuine Progress Index
ha	Hectare (2.47 acres)
ISQ	Inherent Soil Quality
NSDAF	Nova Scotia Department of Agriculture and Fisheries (as of 2000)
NSDAM	Nova Scotia Department of Agriculture and Marketing, now changed to Nova Scotia Department of Agriculture and Fisheries
PLF	Physical Land Flexibility

1. Introduction

It is important to take stock of what productive capacity is available in the agriculture sector before assessing the value of flows into and out of agriculture. Here we focus on land as one basic key to productive capacity. Other reports in the GPI Soils and Agriculture Accounts for Nova Scotia series examine other fundamental productive elements, such as soil, biodiversity, water, and human and social capital.

Although some agricultural enterprises (such as intensive livestock or greenhouse operations) are not overtly "land-based" (i.e., they have a very high production to land ratio), most farming depends on good land to produce agricultural products. The questions we seek to answer in this analysis are:

- How much appropriate land is available for agriculture in Nova Scotia?
- What is its market value and productive value?
- How has this stock of land and its value changed over time?

The three key indicators of land capacity referenced here are:

- Available farm land
- Inherent soil quality
- Flexibility of land use

2. Available Farm Land

How much land in Nova Scotia is available to and appropriate for agricultural production? Estimates of land area suitable for crops and tame pasture in Nova Scotia range from a low of 138,000 ha (land in crops and pasture in 2006) to a high of 1.6 million ha (including potentially suitable land not currently in crops and pasture) (Tables 1 and 2, and Figure 1 below).

The wide range of estimates raises an important question on agricultural resource capacity: Are only 138,000 ha of land being used for agriculture in Nova Scotia because that is the only land worth farming, or is there significantly more land in the province that would be worth farming if market or other circumstances were more favourable?

This question can best be answered with respect to land classifications (Table 4 below). Thus, all land in Classes 1–4 can be considered potentially appropriate for agriculture, though land in Class 4 has some "very severe limitations" for agriculture, and there is no Class 1 land in Nova Scotia. There are nearly 1.6 million ha of land in Nova Scotia in Classes 2, 3, and 4—the high estimate noted above. However, even if all this land were used for agricultural purposes, we would have to subtract 30% of this area for infrastructure, roads, edges, ponds, hedgerows, and woodlots. This would leave about 1.1 million ha of land potentially appropriate for crops and pasture (1,101,523 ha).

This estimation method correlates with the total amount of Nova Scotia land in Classes 2 and 3 (Table 3 below)—1,149,194 hectares. That figure can therefore taken as the amount of land potentially appropriate for crops and pasture in Nova Scotia *if* that land has not already been converted irreversibly to other purposes. Land in Classes 2 and 3 can be classified as "dependable" agricultural land, but, as indicated in Table 3, constitutes only about one-fifth of Nova Scotia's land area. Unfortunately, no data are available at present on the percentage of agriculturally appropriate land that has been converted to other purposes in Nova Scotia.

Recent sharp rises in the price of fuel, global food price increases, and commodity price fluctuations due to storms, climate change, drought, and other events have led to renewed insecurity about our food supply. As a result, many jurisdictions are examining whether they can reduce their dependence on imported food supplies that may be uncertain and that are subject to increasingly expensive transportation costs. These circumstances give new importance to the issue of land capacity examined in this report, since an emerging question is whether Nova Scotia could feed itself in event of emergency, and whether it has sufficient farm land to produce enough food for its own population.

Roughly speaking, the answer to this question is yes. There are presently about 936,000 people in Nova Scotia.[1] It is estimated that over half a hectare of farm land (0.524 ha) is needed to produce enough food for one person for one year.[2] Farmers would therefore need access to 490,444 ha of farm land to provide enough food for all Nova Scotians. It therefore appears that we have roughly twice the amount of land suitable for crops and pasture needed to feed ourselves, though this very rough calculation does not take into consideration issues like proximity of farm land to markets, processing infrastructure, or inputs, or whether the land is broken into small parcels or exists in larger tracts more convenient for farming. Even more importantly, we do not presently know what proportion of this roughly million hectares potentially suitable for agriculture in Nova Scotia has already been converted to other uses.

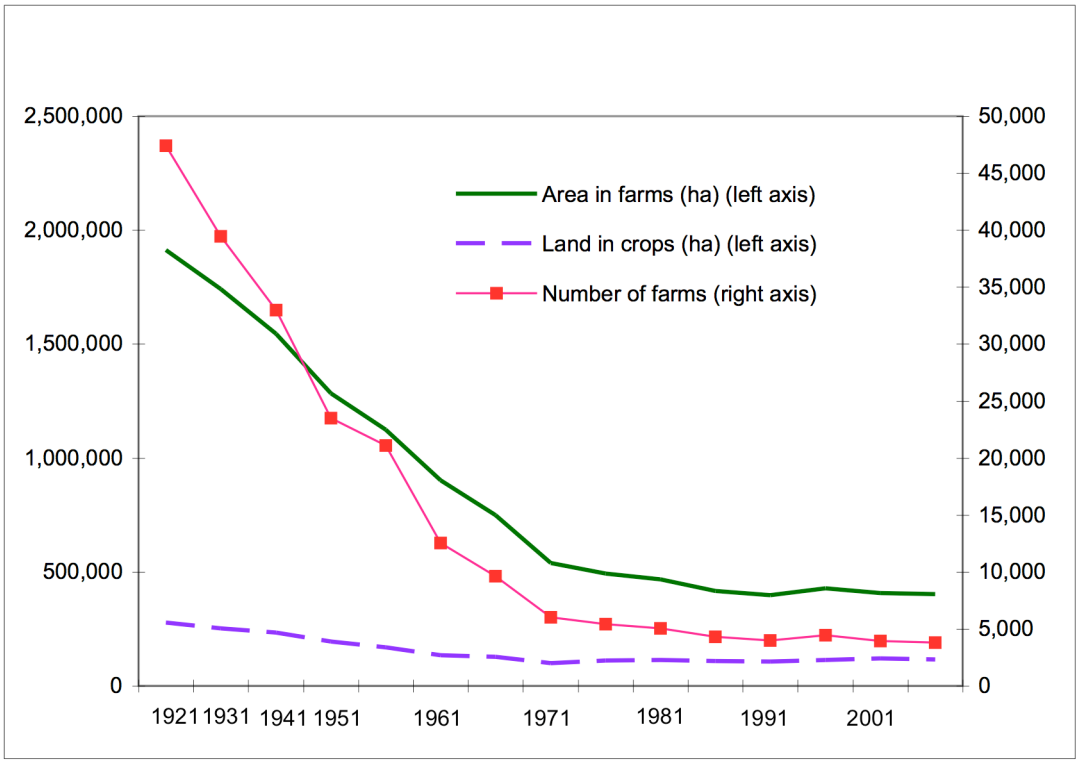
If Nova Scotia has about a million ha of land potentially suitable for farming (i.e., capable of supporting crops and tame pasture), how much is this land worth?[3] There are a number of different ways to estimate land value. One method is to estimate the market value of the land. A second method is to determine an "economic rent" value based on net output potential from the farm (see Table 7). Both of these methods are incomplete, and they are therefore presented here only as a starting point for agricultural land valuation.

[1] Statistics Canada 2008. CANSIM table 051-0005.
[2] BC Ministry of Agriculture and Lands. 2006. BC's Food Self Reliance: Can BC's Farmers Feed Our Growing Population? Available from Smart Growth BC: http://www.smartgrowth.bc.ca. Accessed June 2008.
[3] It has been argued that land is not something that should be bought, sold, and valued in the same manner as manufactured commodities, because it is a precious natural resource and inherently "invaluable." An attempt here to place a dollar value on Nova Scotia's farm land cannot therefore be accurate or complete, but can serve to draw attention to the fact that land has significant value in providing a foundation for the production of food, and, therefore, that this value should not be squandered or taken for granted. It is necessary to make this obvious fact explicit in light of the reality that, throughout Canada, there has been a trend to develop, for residential, commercial, and industrial purposes, some of the country's most productive farm land.

Based on historical Census results, Figure 1 below indicates that both the number of farms in Nova Scotia and the land area in farms dropped precipitously from the early 1920s to the early 1970s, then declining more gradually in the 1970s and 1980s, and stabilizing somewhat since the early 1990s. As indicated in Table 2 below, the land area in farms in Nova Scotia dropped by nearly 80% between 1921 and 2006. But most of that decline—from 1.9 million ha to half a million ha—occurred between the early 1920s and the early 1970s (a 74% decline), with a further 18% decline to about 400,000 ha since that time.

As Figure 1 and Table 2 below indicate, the actual land in crops in Nova Scotia declined by about 65% from the early 1920s to the early 1970s, but has been relatively stable since then, even increasing somewhat between 1991 and 2001. Tables 1 and 2 indicate that the total land in crops *and* pasture declined by nearly 80% between 1921 and 2006, with most of that decline again occurring from the early 1920s to the early 1970s. Since the mid-1970s, the total land in crops and pasture in Nova Scotia has declined by about 10%.

Figure 1. Nova Scotia Farm and Crop Area, and Number of Farms (1921–2006)



Source: Derived from Statistics Canada, Census of Agriculture.[4]

[4] Number of farms: http://www.statcan.ca/english/freepub/95-632-XIE/2007000/tables/table1.1-en.htm. Note: The definition of a census farm has changed between 1921 and 2001. These changes affect the comparability of data among censuses. For a summary of these changes, see Census Farm in the Glossary. Area in farms: http://www.statcan.ca/english/freepub/95-632-XIE/2007000/tables/table1.1-en.htm. Land in crops: http://www.statcan.ca/english/freepub/95-632-XIE/2007000/tables/table1.1-en.htm. Note: For each of the censuses

Table 1. Estimates of Available Land for Crops and Pasture, Nova Scotia[5]

Amount of land appropriate for crops and pasture (hectares)	Reasoning	Reference
670 thousand ha	Estimated amount of land in crops and pasture in 1921 (based on 35% of total farm area*)	Statistics Canada. Census of Agriculture
140 thousand ha	Reported land in crops and pasture in 2006	
1,574 thousand ha	Land in CLI inventory Classes 2–4, considered to be usable for agriculture (land in Class 4 has some "very severe limitations" for agriculture).	Statistics Canada (2005) Human Activity and the Environment
1,149 thousand ha	Land in CLI inventory Classes 2 and 3, considered to be more favourable for agriculture.	

Sources: Statistics Canada, Censuses of Agriculture, 1921 and 2006; Statistics Canada, Human Activity and the Environment, 2000.

* Note: In 2006, 35% of Nova Scotia's farm area was in crops and pasture, and the percentage of farm area in crops and pasture remained between 32% and 36% for the period 1976–2006 (Table 2 below). The 35% estimate has been extrapolated by the author to the total farm area data for the 1921 to 1971 period to provide estimates of the land in crops and pasture during that earlier period.

conducted between 1921 and 1976, land in crops included field crops, vegetables, fruits, and nursery crops. Since 1981, the definition of land in crops has been expanded to include sod.

[5] Unless otherwise indicated, "pasture" in this discussion refers to "tame or seeded pasture."

Table 2. Crop and Pasture Land in Nova Scotia (1921–2006)[6]

Year	Total area of farms (ha)	Land in crops (ha)[7]	Summer -fallow (ha)	Tame or seeded pasture (ha)	Land in crops and pasture (ha)[8]	Farm area in crops and pasture (%)
2006	403,044	116,609	1,083	23,381	139,990	35
2001	407,046	119,219	609	22,873	142,701	35
1996	427,324	112,364	579	25,005	137,948	32
1991	397,031	106,231	1,186	30,723	138,140	35
1986	416,507	109,512	3,910	36,236	149,658	36
1981	466,023	112,782	5,154	46,106	164,042	35
1976	493,293	111,667	2,909	42,447	157,023	32
1971	537,777	98,322	N/A	N/A	188,222	N/A
1966	749,435	127,129			262,302	
1961	902,609	133,188			315,913	
1956	1,123,262	168,444			393,142	
1951	1,284,347	193,221			449,521	
1941	1,544,542	233,072			540,590	
1931	1,740,970	252,408			609,340	
1921	1,911,553	278,448			669,044	

Source: Statistics Canada, 1997. Historical Overview of Canadian Agriculture; Statistics Canada, 2006. Census of Agriculture. Available from http://www.statcan.ca/english/freepub/95-629-XIE/4/4.3-1_A.htm.

Note: Direct data on land in crops and pasture in Nova Scotia for 1921–1971 are not available. Those data have only been collected directly since the 1976 Census of Agriculture. Therefore, the shaded statistics on land in crops and pasture for the 1921–1971 period are extrapolations by the author based on the percentage of farm area in crops and pasture in 2006. In 2006, 35% of Nova Scotia's farm area was in crops and pasture, and the percentage of farm area in crops and pasture remained between 32% and 36% for the period 1976–2001 (column 6 of Table 2). Thus, the 35% estimate has been extrapolated to the total farm area data for the 1921 to 1971 period to provide estimates of the land in crops and pasture during that period.

[6] The definition of "farm" has changed over time, making exact comparisons between years difficult.
[7] Since 1981 the definition of "land in crops" has been expanded to include "sod."
[8] Crop and pasture land also includes "summer fallow" land for this table. Estimated areas in the shaded cells are based on 35% of total farm area.

Table 3. Canada Land Inventory: Soil Capability for Agriculture[9] in Nova Scotia

Class[10]	Area (hectares)	% of total NS land area	Cumulative total area (ha)
1	0	0	0
2	166,317[11]	3.1	166,317
3	982,877[12]	18.6	1,149,194
4	424,410	8.0	1,573,604
5	82,215	1.6	1,655,819
6	14,325	0.3	1,670,144
7	3,516,041	66.5	5,186,185
Organic[13]	116,301	2.2	5,302,486
Unclassed	246,514	4.7	5,549,000
Total land area	5,549,000	100	

Source: Statistics Canada, Human Activity and the Environment, 2000.

[9] Statistics Canada. 1986. Human Activity and the Environment. Catalogue No. 11-509E, p.67.
[10] Class 1, 2, and 3 land is considered to be "dependable agricultural land," and is therefore shaded. See also Table 4 for more detailed descriptions of the various classes of land.
[11] This area was updated to 170,000 ha when more detailed soil maps were developed (Hofmann et al. 2005).
[12] This area was updated to 1,021,900 ha when more detailed soil maps were developed (Hofmann et al. 2005).
[13] The classification "organic" applies to peatlands, bogs, and marshes capable of supporting agricultural production and distinguishable from mineral soils by their high organic content.

Table 4. Soil Classification in the Canada Land Inventory

Class	Description
1	Soils in this class have no significant limitations for crops. These deep soils are level or have very gentle slopes, are well to imperfectly drained and have a good water-holding capacity. They are easily maintained in good tilth and productivity, and the potential for damage from erosion is slight. They are moderately high to high in productivity for a wide range of field crops adapted to the region.
2	Soils in this class have moderate limitations that restrict the range of crops or require moderate conservation practices. These deep soils have a good water-holding capacity, can be managed with little difficulty and are moderately high to high in productivity for a fairly wide range of field crops. The moderate limitations on these soils may be from any one of a number of factors, including mildly adverse regional climate; moderate effects of erosion, poor soil structure, or low permeability; low fertility correctable with lime; gentle to moderate slopes; and occasional overflow or wetness.
3	Soils in this class have moderate to severe limitations that restrict the range of crops or require special conservation practices. Under good management, these soils are fair to moderately fair in productivity for a wide range of field crops adapted to the region. Conservation practices are more difficult to apply and maintain. Limitations arise from a combination of two of the factors described under Class 2, or from one of the following factors: climate, erosion potential, low fertility, strong slopes, poor drainage, low water-holding capacity, or salinity.
4	Soils in this class have severe limitations that restrict the range of crops or require special conservation practices, or both. In this class, the type of limitation found may be one or more of the following: inundation, moisture limitation, stoniness, consolidated bedrock, topography, excess water (applies to the continuing drainage of the soil after improvement, if feasible, by tile), undesirable structure or low permeability and coarse fragments, or the cumulative effect of three or more Class 3 limitations.[14]

Source: Statistics Canada, Human Activity and the Environment, 2000.

According to Statistics Canada's *Agriculture Economic Statistics* reporting series, the 2006 estimated *real estate* value of total farm land in Nova Scotia was $562 million (Table 5 below). This estimate includes all farm land, not just the area in crops and pasture. The real estate value of farm land per ha has remained remarkably stable between 1981 and 2006.

The estimated value of *farm land and buildings* combined is also tracked by Statistics Canada in its *Agriculture Economic Statistics* series. These values, although not just for farm land, are included in Table 6 below for reference purposes. When buildings are included in the market value of farms, the value of farms more than doubles. Between 1971 and 1981, the per hectare and total estimated value of farm land and buildings more than doubled, but it has remained quite stable since then (Figure 6).

[14] Holmstrom, D. and Thompson, B. 1989. *Soils of the Annapolis Valley Area of Nova Scotia*. Report No. 22 Nova Scotia Soil Survey. Agriculture Development Branch, Agriculture Canada.

Table 5. Estimated Real Estate Value of Nova Scotia Farm Land 1981–2006[15] , $2007

Year	Total estimated real estate value of land in farms (000s of $2007)	Area of land in farms (ha)	Real estate value per ha[16] ($2007)
1981	631,265	466,023	1,355
1986	546,231	416,507	1,311
1991	519,177	397,031	1,308
1996	576,269	427,324	1,349
2001	630,627	407,046	1,549
2006	561,873	403,044	1,394

Source: Statistics Canada 2008. Balance Sheet of the Agricultural Sector. Agriculture Economic Statistics. Cat. No. 21-016-X; Statistics Canada, Census of Agriculture.

[15] Area of "land in farms" must be distinguished from area in crops and pasture, which comprises about 35% of "land in farms."
[16] Column 1, divided by column 2, multiplied by 1,000.

Table 6. Estimated Market Value of Nova Scotia Farm Land and Buildings 1971–2006 , $2007

Year	Total estimated value of land and buildings in farms (000s of $2007)[17]	Area of land in farms (ha)[18]	Value of farm land and buildings ($/ha)[19]
1971	714,706	537,777	1,329
1976	1,158,745	493,293	2,349
1981	1,472,167	466,023	3,159
1986	1,116,239	416,507	2,680
1991	1,075,954	397,031	2,710
1996	1,239,240	427,324	2,900
2001	1,321,271	407,046	3,246
2006	1,216,387	403,044	3,018

Source: Derived from Statistics Canada, 2008. Value of Farm Capital. Agriculture Economic Statistics. Cat No. 21-013; Historical Overview of Canadian Agriculture; Census of Agriculture.

In a special study of land value, Statistics Canada (1996) explored the idea that land value is actually more closely related to its *productive capacity* or "economic rent" than to its estimated resale or *market* value. Productive capacity is determined by subtracting expenses from actual farm cash receipts generated on Nova Scotia farms. This provides an estimate of the ability of the land to generate net income in any given year and will therefore vary from year to year according to revenues, expenses, and income in each year. Based on this premise, the productive capacity value of Nova Scotia farm land, as estimated by the author for the 1971–2006 Census years, is provided in Table 7 below.

When Table 7 results are compared to those in Tables 5 and 6, it is clear that the net productive capacity of Nova Scotia's farm land has declined significantly relative to market land values, with the most dramatic decline occurring between 1996 and 2006 when farm income plunged dramatically. Since the early 1980s, the net productive capacity of the land has been less than 5% of its estimated market value, and after 2001 it dropped below 1% of that value. The value of annual net productive capacity averaged about $55 per hectare between 1981 and 2006.

There are many flaws with the "productive capacity" approach to land values presented in Table 7 below. Some greenhouse operations and hog or mink farms are not "land-based," and would be considered more like production plants than land-based farms in which land is the primary means of production. Productive capacity figures based on non land-based farms would therefore not

[17] Derived by multiplying value of farm land and buildings per ha, by area of land in farms (ha).
[18] Statistics Canada 1997b; Statistics Canada 2006. Available from http://www.statcan.ca/english/freepub/95-629-XIE/1/1.5.htm - 12.
[19] Statistics Canada 2008. Value of Farm Capital. Agriculture Economic Statistics. Cat No. 21-013.

reflect the land's actual productive capacity. Also, fluctuations in farm product prices and in the prices of inputs like fossil fuels, feeds, capital improvements, pesticides, and fertilizers have a large impact on the productive capacity figure, but have nothing to do with the actual capacity of the land.

Table 7. Estimated Productive Value of Nova Scotia Agricultural Land 1981–2006

Year	Estimated annual net productive value (000s of $2007)[20]	Ratio of productive value to market land value (return on land value) (%)[21]	Net productive capacity/ha (2007$/ha)[22]
1981	41,842	6.6	89.8
1986	47,881	8.8	115.0
1991	34,042	6.6	85.7
1996	38,999	6.8	91.3
2001	1,814	0.3	4.5
2006	-23,807	-4.2	-59.1
average	23,461	4.15	54.5

Source: Derived from Statistics Canada, 2008. *Agriculture Economic Statistics*.

The productive capacity figures do, however, give an estimate of the ability of the farmer to generate income from the land. The productive capacity figures also take into consideration many other variables such as distance to markets, climatic factors, product prices, and flexibility of crop and livestock options. In addition, they provide a more holistic picture of land value than just the estimated market value given in Table 5 above.

Based on the results in Tables 5 and 7 above, Table 8 below shows the total estimated annual net productive value ($22 million) and estimated market value ($562 million) for farmed land in Nova Scotia. If we were to use the same figures[23] to estimate the value of *potentially suitable* land for farming, we would arrive at an estimated annual productive value of $63 million and an estimated market value $1.6 billion.

This estimate indicates that there is substantial value inherent in the stock of land potentially suitable for agricultural production in Nova Scotia. Other reports in the GPI Atlantic Soils and Agriculture Accounts series outline additional values associated with the land and its many amenities, such as the productive values inherent in soil and biodiversity, for example.

[20] Productive capacity is estimated by subtracting farm expenses from farm revenues for the year in question. All subsidies, insurance payments, and producer premiums were excluded. Depreciation on buildings and machinery was included, as were values of inventory changes, but the value of unpaid labour was not included. Productive capacity is therefore very similar to net farm income with the subsidies taken out (Statistics Canada 2008. Agriculture Economic Statistics. Cat. Nos. 21-011 and 21-012).

[21] Productive value divided by estimated total land value from Table 5 above.

[22] Productive value divided by total farmed land from Table 5 above.

[23] Using the same figures for *actual* and *potential* farm land is clearly not as accurate as would be desirable, and likely overestimates the productive value of potential farm land, as potentially suitable farm land will almost certainly have a lower productive value than actual farm land (assuming that the best agriculture land is already used for farming).

Table 8. Summary of Farm Land Value in Nova Scotia ($2007)

	Area (ha)	Average annual net productive value ($55/ha)[24] * area	Estimated 2006 market value ($1,394/ha[25]) * area
Land in farms, 2006	403,044	22,167,420	561,873,300
Potential land suitable for crops and pasture (total of Class 2 and 3 land)	1,149,194	63,205,670	1,601,976,436

Since there is a limited amount of productive farm land, and since the rising cost of fuel and transportation is reviving interest in localized food production and consumption systems (Halweil 2002), farm land conservation has become a priority in recent years. However, it is difficult to maintain productive land for farming purposes in Nova Scotia (and elsewhere), and to avoid its development for other purposes, when the average annual net productive value of farm land is only $55/ha (and in 2006 was minus $59/ha) (Table 7), in sharp contrast to the average market value of $1,394/ha (Table 5).

It is the difference between the *productive value* and the *market value* of farm land that helps farm land conservation organizations determine the value of farm Conservation Easements.[26] Such Conservation Easements are attached to the deed of the farm, and "run with the land," which means that they remain in place even when the farm is sold. These Conservation Easements are signed by those farmers who agree to "resale restrictions," and to prohibitions against selling off lots (among other restrictions), in return for a one-time compensation. Because of these restrictions and because the farm is thereby removed from the speculative real estate market, the resale value of the farm land under easement goes down, making the land more affordable for the next generation of farmers, and thus encouraging its continued use for farming purposes.[27]

The cost of purchasing Conservation Easements on working farm land in Nova Scotia can be estimated from the figures in Table 8. The difference between the estimated average real estate value of farm land ($1,394/ha) and the estimated average productive value of farm land ($55/ha) is $1,339/ha. At this rate, it would cost about $540 million dollars to protect all farm land for

[24] Average estimated annual productive capacity from Table 7 equals $55/ha (in $2007). Averages are used to estimate the land's productive value over time, and to somewhat remove the effect of yearly changes in policies, climatic conditions, market fluctuations, and other factors.
[25] The real estate value of land in Nova Scotia farms ($2007) is estimated to be $561,873,300 in 2006 (Table 5). In 2006, the area of land in farms was 403,044 ha (Table 6). $561,873,300/403,044 ha gives a value of $1,394/ha.
[26] Kim Good, Agriculture and Agri-Food Canada, personal communication, March 22, 2007.
[27] One reviewer, Pierre Cloutier, noted, "I found the section on Conservation Easements to be the most valuable. I would be very interested in seeing some calculations that combine Annual Net Productive Value and Estimated Market Value (Table 8), to produce a suggested compensation value for the farmer willing to enter into an Easement. This would enable us to undertake concrete measures to assist farmers."

farming in Nova Scotia. In reality, however, each Conservation Easement would be assessed based on independent professional appraisals, rather than on average provincial figures.[28]

3. Inherent Soil Quality and Vulnerability

Some soils are inherently better for agriculture than others, no matter what productive elements (such as fertility additions, tillage, etc.) are applied to them. Acton and Gregorich (1995) use an all-purpose indicator they call "Inherent Soil Quality" (ISQ) to rank land resources according to four elements which determine their ability to produce crops:

- soil porosity (providing air and water for biological processes)
- nutrient retention (measured most conveniently as cation exchange capacity)
- physical rooting conditions
- chemical rooting conditions

Acton and Gregorich (1995) compiled data from existing land resource inventories, rating each of these four elements from "poor" to "good." The ISQ has the potential to alert us to possible vulnerability thresholds. These thresholds may also indicate where economic loss is most likely, or the point beyond which the soil is no longer able to be "repaired" or "rebuilt." The four ISQ elements have been rated and mapped, both individually and together, for the Prairie Provinces. It would be useful to produce similar information for Nova Scotia and the other Maritime provinces, which would allow this indicator to be populated with reliable data for this region in the future.

Soils in Nova Scotia have presently only been cursorily assessed in terms of capacity to produce. According to Acton and Gregorich (1995:58), they are "inherently weakly structured, low in soil organic matter and nutrients, and acidic. Poor soil structure may be evident as compacted subsoils or the presence of naturally occurring hardpans or hard-set layers, or both." Therefore, some of the structural weaknesses of soils in this region are naturally occurring, while another portion (particularly compaction) is due to "[t]he use of heavy machinery on moist, fine-textured soils during the wet conditions of early spring and late fall [which] accelerates structural degradation." Structural weakness due to farming methods is assessed in another report in the GPI Atlantic Soils and Agriculture series—Soil Quality and Productivity.

In addition to soils with poor structure (which affects physical rooting conditions), Nova Scotia has a high percentage of sloped land in high-rainfall areas. Table 9 below shows the inherent risk of water erosion on bare soil. Although soil is not "inherently" or "naturally" bare—allowing risks to be ameliorated by appropriate cover—this bare soil risk assessment is still highly informative in revealing the relative degree of inherent erosion risk. As indicated in Table 9, a very high proportion (84%) of the province's cultivated agricultural land is *inherently* severely vulnerable to risk of water erosion, compared to just 13% in Canada as a whole.

[28] Good, K. and Michalsky, S. 2008. *Summary of Canadian Experience with Conservation Easements and their Potential Application to Agri-Environmental Policy,* AAFC Draft.

Of course, this land is only vulnerable if it is left bare, indicating that it should be kept in pasture, hay, orchard, agroforestry, or other perennial cover options. However, the reality of greater inherent vulnerability to water erosion limits agricultural options in Nova Scotia, has economic impacts, and requires Nova Scotian farmers to take extra care to maintain soil quality. As noted, the effects of, and costs of soil erosion, are assessed in another report in the GPI Atlantic Soils and Agriculture series—Soil Quality and Productivity.

Table 9. Inherent (Bare Soil) Risk of Water Erosion on Canada's Cultivated Land

Cultivated Land (%)						
Risk class	ON	QC	NB	**NS**	PE	Canada
Negligible	12	18	0	**3**	1	40
Low	11	21	4	**6**	7	23
Moderate	24	14	16	**4**	11	17
High	25	4	13	**3**	37	7
Severe	27	43	67	**84**	44	13

Source: Acton and Gregorich (1995), *The Health of Our Soils*

4. Flexibility of Land Use

According to Neave et al. (1995), physical land flexibility (PLF) is a measure of "the degree to which current yields in an area are approaching potential yields. It is also a measure of the degree of flexibility to buffer against outside stress. PLF reflects the ability of a region to diversify production, and its capability to withstand climatological and economic stress." In essence, this is a measure of resilience.

Regional PLF values in Manitoba, Saskatchewan, and Alberta were compared to the regional maximum. The analysis demonstrated that "southern Manitoba has the highest physical land flexibility, followed by areas in the Black Chernozemic soil zone in Saskatchewan and Alberta. These areas have the highest production capacity and are highly responsive to management." PLF values are indexed to the maximum in the region, allowing analysts to assess the ability of an area to be flexible and responsive to change in relation to an existing benchmark. This measure of resilience indicates improved opportunities for viable farm operations and high production dependability.

PLF values have not yet been assessed for Nova Scotia or the Maritimes. However, like the ISQ above, this PLF measure would be very important to track over time in Nova Scotia and the other Maritime provinces. Although we may predict that Nova Scotia would likely have some relatively high PLF values because of the province's ability to grow a number of diverse and different crops, and because of pockets of excellent growing conditions (as in the Annapolis

Valley), we currently have no way of knowing whether this resilience and flexibility have increased, declined, or remained stable over time.

Like the ISQ, the PLF measure has been tried and tested in the Prairie provinces, and therefore can certainly be applied systematically to the Maritimes. Again, the resulting data will hopefully populate this indicator in the future. Because of the importance of this indicator, we therefore strongly recommend its systematic application to Nova Scotia and the Maritimes.

From the GPI capital accounting perspective, land capacity is a natural capital asset or "stock." But the value of a stock, and its appreciation or depreciation over time, depends on both quantitative and qualitative factors. Thus, capital depreciation can occur as a result of either depletion (when productive farm land is paved over, for example) or degradation (such as a decline in soil quality). We have seen that sufficient data are available for Nova Scotia at least to begin making preliminary value assessments of provincial farm land based on the quantity of Class 2 and 3 land, though major information gaps exist particularly in knowing the proportion of that land that has been irreversibly converted to other uses. Beyond such valuations based on the amount of fertile land, the ISQ and PLF measures have the potential to provide additional and vital qualitative components to the assessment of agricultural land capacity and its value.

Although PLF values have not yet been developed for the Atlantic region, we can take a closer look at the potential use of land in Nova Scotia in other, albeit less rigorous, ways. Thus, Table 10 below provides a breakdown of potential farm land in the province versus actual land used for farming at this time. The results indicate that all land suitable for pasture is not presently being used to capacity, and that there may even be some land suitable for crop land that is also not presently being used as crop land. Thus, Table 10 indicates that 27.8% of Nova Scotia's Class 2 land (suitable for growing crops) and 96% of the province's Class 3 and 4 land (suitable for pasture)[29] is not presently used as farm land.

Some important caveats to these findings are presented and discussed in the concluding section below. Here we simply note that the calculations in Table 10 below on potential excess crop land and pasture assume that this land is in fact available for agriculture. However, because data on conversion of Class 2 and 3 land for non-agricultural purposes in Nova Scotia are unavailable, we do not in fact know what proportion of the "potential" farm land noted in Table 10 below has already been developed or converted to other purposes.

Nevertheless, Table 10 does seem to indicate that—unlike other areas of the country where the area under cultivation actually exceeds the supply of what is classified as dependable land[30]—

[29] Sometimes class 3 land is used for orchard and crops.

[30] McRae, T., Smith, C., and Gregorich, L. eds. 2000. *Environmental Sustainability of Canadian Agriculture: Report of the Agri-Environmental Indicator Project.*
For example, between 1901 and 1996, Canada's cultivated land area (land under crops and summer fallow) expanded five-fold. By contrast, the supply of dependable agricultural land (Classes 1, 2, and 3 of the Canada Land Inventory Capability Classification for Agriculture) dropped by an estimated 16% over this period because of conversion of prime farm land to urban and other non-agricultural uses—particularly in southern Ontario. In the 1980s, the area of land under cultivation in Canada actually surpassed the supply of dependable land. This situation

Nova Scotia's actual and potential farm land does not presently appear to be used to capacity. In some *prime* farm land areas such as Kings County, however, there are land use conflicts between housing or other developments on the one hand and farming on the other. And Robinson et al (1996) further indicate that land available for high value crops is in short supply in Nova Scotia. In other words, the highly suggestive conclusions that seem to emerge from Table 10, pointing to apparently unused agricultural capacity, will require considerable further investigation before it can be determined what proportion of the "excess" potential crop land and pasture could actually be converted to agricultural purposes in reality.

Table 10. Actual and Potential Land Resources in Nova Scotia, 2006

Potential and actual farm land		Area (ha)
Total land area of province		5,549,000
Estimates of potential farm land (from CLI)[31]	Land suitable for producing crops	Class 2: 166,317
	Land suitable for perennial forage	Class 3: 982,877 Class 4: 424,410 (more marginal) Total 3 + 4: 1,407,287
Estimates of actual farm land, 2006[32]	Total farm land	403,044[33]
	Land in "crops"	116,609 (plus 1,083 in summer fallow) (Nova Scotia's crop land has remained fairly stable between 110,000 and 120,000 ha since 1976.)
	Land in pasture	23,381 in tame or seeded pasture 31,708 in natural land for pasture Total pasture: 55,089
Potential farm land not used as farm land	Land in crops	48,625 ha potential excess crop land[34]
	Land in pasture	1,352,198 potential excess pasture[35]

Sources: Statistics Canada, 2000. Human Activity and the Environment; 1997b Historical Overview of Canadian Agriculture; Census of Agriculture.

indicates that agricultural production in Canada is becoming more reliant on marginal land, with possible adverse effects on productivity, soil quality, wildlife habitat, and other environmental factors.

[31] CLI areas from Statistics Canada's Human Activity and the Environment are used because an ISQ rating has not yet been developed for Nova Scotia.

[32] Statistics Canada, Census of Agriculture. Available from http://www.statcan.ca/english/freepub/95-629-XIE/4/4.3-5_A.htm.

[33] The area reported is the total area in farms from the Census of Agriculture for 2006. Statistics Canada, Census of Agriculture. Available from www.statcan.ca/english/freepub/95-632-XIE/2007000/tables/table1.1-en.htm.

[34] Derived by subtracting actual land used for producing crops (117,692 ha) from land suitable for producing crops (Class 2 land: 166,317 ha as reported in the CLI).

[35] Derived by subtracting actual land used for pasture (55,089 ha) from land suitable for pasture (class 3 and 4 land: 1,407,287 ha as reported in the CLI).

If we turn around the previous "deficit analysis" focussing on limitations in Nova Scotia's agricultural capacity to examine instead the potential and assets in Nova Scotia's land resource rather than its "limitations," we may find that Nova Scotia's actual and potential farm land has an even higher value than originally estimated in Tables 5–7 above. The Canada Land Inventory (CLI) system, for example, relegates land suitable for hardy livestock or blueberries to lower

"classes," giving higher classifications instead to land most suitable for field crops such as grain or row crops such as potatoes. Classifying Nova Scotia's presently under-valued blueberry-producing land in a higher class might therefore increase the total designated value of the province's farm land. Granted, the CLI was developed for the specific purpose of assessing land suitable for general field crops.[36] This is one reason that the PLF is potentially a better and more balanced indicator of agricultural resilience, because it incorporates the value of diverse production and ability to withstand stress into a more comprehensive analysis.

Thus—in the absence of PLF data for Nova Scotia and in reliance on more general and less comprehensive, nuanced, and satisfactory indicators—it is easy to forget how much detail and potential are presently lost in the determination of "suitable land for agriculture." For example, land classified as "unsuitable for agriculture" because of its susceptibility to drought might grow excellent high value vegetables with the application of irrigation.

The questions we must ask in determining the potential value of farm land in Nova Scotia are therefore seen to be numerous and complex. For example:

- What does this land "want" to grow and to what particular form of agricultural production is it most suited?
- If we are producing perennial forages, how can we make the best and most productive and valuable use of them?
- What other resources do we have to work with in Nova Scotia (such as presence of seaweed, fish processing waste, favourable microclimates, manure, proximity to markets) that can potentially enhance the province's agricultural capacity and farming advantages?

Such qualitative considerations can have a major impact on agricultural land capacity and on the valuation of the province's farm land, going far beyond the simple real estate and market valuations described earlier.

In short, such an asset-based analysis can not only help identify presently hidden agricultural potential in Nova Scotia, but may indicate a higher potential economic value for the province's land resources than indicated earlier. Both the ISQ and the PLF are very useful instruments that can assist in assessing this potential, and therefore should be systematically applied to Nova Scotia, as they have been in the Prairie provinces.

[36] Gary Patterson, NSDAF, personal communication.

5. Conclusion—Data Gaps and Uncertainties

The results in Table 10 above appear to indicate that there is a great deal of unused potential value in Nova Scotia's "stock" of agriculturally useful land. This would put Nova Scotia in a unique position, as other areas of the country are experiencing agricultural land stock shortages, in part due to the conversion of prime agricultural land to residential, commercial, and industrial development. In the 1980s, the area of land under cultivation in Canada surpassed the supply of "dependable" land (McRae et al, 2000). This situation indicates that agricultural production nationwide is becoming more reliant on marginal land, with possible adverse effects on productivity, soil quality, wildlife habitat, and other environmental factors.

By contrast, Table 10 indicates that 28% of Nova Scotia's Class 2 land (suitable for growing crops) and 96% of the province's Class 3 and 4 land (suitable for pasture) are not presently used as farm land. In other words, the province *appears* to have an excess of potentially productive agricultural land suitable for farming.

However, considerable caution is required in interpreting the estimates presented here, and several major caveats are required. First, there exist many data gaps in our knowledge of land availability and suitability. In particular, no data from Statistics Canada are available at this time to determine how much of the land in each soil class is actually available for farming and how much of it has been used for other purposes.[37] Data are available from Statistics Canada regarding conversion of Class 1 land to other purposes, but there is no Class 1 land in Nova Scotia (Hofmann et al., 2005: 7–8).

There is also uncertainty about the CLI classifications themselves. For example, farmers have described some land that is considered unsuitable for farming according to the CLI classification as actually quite productive when irrigation is used. According to Robinson (2005: 19): "In recent years, 'early land' with adequate water for irrigation has become among the most valuable farm land in the Annapolis Valley. In the past such land was rated poorly."

As well, the finding on potential excess crop land and pasture land appears to be contradicted by evidence in Kings County, where much of Nova Scotia's most inherently productive land is located. In Kings County there appears to be a shortage rather than an excess of suitable farm land—particularly in continuous (rather than fragmented) parcels of farm land. According to Robinson (2005:21):

> [T]he overall farming capacity [. . .] of Kings County is disproportionately large relative to its comparatively meagre agricultural land resources. In 2001 the county accounted for 0.49% of the total agricultural employment in Canada but [. . .] only 0.07% of the country's crop land area. Similarly the industry's commercial infrastructure including agricultural processing is large relative to a total crop land base of only 58,000 acres [23,500 ha]. One aspect of local agriculture, which partly reconciles these differences, of course is in the importance of non-land based production, especially poultry, eggs, and

[37] Nancy Hofmann, Statistics Canada, personal communication, July 2, 2008.

> hogs in the county. Another is the emphasis on land-intensive horticulture or high value crops. This commodity focus was influenced largely by the scarcity of farm land facing those attempting over time to develop farm and related businesses […]. It is the availability of good farm land in sizeable blocks that is most limiting for farm development.

The scarcity of farm land in Kings County, along with the high cost of land and competition with housing and commercial developments, generally means that farmers have to crop more intensively and "make every acre pay"—thus discouraging more extensive, soil-building pasture and hay-based beef or sheep systems, and discouraging the use of soil-building phases of a rotation. When good farm land is scarce, it becomes cheaper in the short run to use fertilizer and to crop all the time rather than to use such soil-building methods. In the long run, however, there may be heavy prices to pay for the intensive use of land. This potential conflict and its consequences are discussed in greater detail in the Soil Quality and Productivity report of these GPI Soils and Agriculture Accounts for Nova Scotia.

In addition to these major caveats, it is also important to ask whether all land *suitable* for agriculture should *actually* be used for agriculture. Some "agricultural land" may (or should) be covered by forests—a potentially beneficial land "use" that complements agricultural production in important ways.

Because of these and other major uncertainties in the existing data on land resource assessment and valuation in Nova Scotia, it is strongly recommended that the Physical Land Flexibility (PLF) and Inherent Soil Quality (ISQ) indicators described above be developed further and applied to Nova Scotia, as their effective application in the Prairie provinces points to their considerable utility and potential to be used as meaningful indicators of agricultural land stock in this province. Since land value is dependent on the quality as well as quantity of available agricultural land, the PLF and ISQ indicators can add important qualitative dimensions to the current, conventional assessment and valuation of agricultural land resources based on available hectares of Class 2 and 3 land.

6. References

Acton, D. and Gregorich, L. eds. 1995. *The Health of Our Soils—Toward Sustainable Agriculture in Canada.* Centre for Land and Biological Resources Research Branch Agriculture and Agri-Food Canada Publication, 1906/E. Ottawa, Ontario.

Halweil, Brian. 2002. *Home Grown—The Case for Local Food in a Global Market.* Worldwatch Paper 163. Worldwatch Institute: Washington, DC.

Hofmann, N., Filoso, G., Schofield, M. 2005. The Loss of Dependable Agricultural Land in Canada. Statistics Canada. *Rural and Small Town Canada Analysis Bulletin*. Cat. No. 21-006-XIE Vol.6, No. 1. http://www.statcan.ca/cgi-bin/downpub/freepub.cgi. Accessed June 2008.

Hofmann, N. 2001. Urban Consumption of Agricultural Land. Statistics Canada. *Rural and Small Town Canada Analysis Bulletin*. Cat. No. 21-006-XIE Vol.3, No. 2. http://www.statcan.ca/cgi-bin/downpub/freepub.cgi. Accessed April 2003.

Holmstrom, D. and Thompson, B. 1989. Soils of the Annapolis Valley Area of Nova Scotia. Report No. 22 Nova Scotia Soil Survey. Agriculture Development Branch, Agriculture Canada.

MacDougall, J., Nowland, J, and Hilchey, J. 1969. Soil Survey of Annapolis County Nova Scotia. Report No. 16 Nova Scotia Soil Survey, Truro Nova Scotia. Canada Department of Agriculture and Nova Scotia Department of Agriculture and Marketing.

McRae, T., Smith, C., and Gregorich, L. eds. 2000. *Environmental Sustainability of Canadian Agriculture: Report of the Agri-Environmental Indicator Project.*

Neave, P., Kirkwood, V., and Dumanski, J. 1995. *Review and Assessment of Available Indicators for Evaluating Sustainable Land Management* . Technical Bulletin 1995–7E. Centre for Land and Biological Resources Research. Agriculture and Agri-Food Canada, Central Experimental Farm, Ottawa. Available from http://res2.agr.ca/ecorc/program3/pub/indicat/overview.htm

NSDAM. 1997. Annual Report for the Fiscal Year Ending March 31, 1997.

NSDAM. 1989. Annual Report for the Fiscal Year Ending March 31, 1989.

Robinson, B., Patterson, G., and Gordon, R. 1996. Combining the USLE and a GIS for Planning Crop Rotations: The Soil Saving Crop Planner (SSCP). Final report to: Canada/Nova Scotia Agreement on the Agricultural Component of the Green Plan. pp.68. Available from http://agri.gov.ns.ca/rs/greenplan/resource/105.html.

Robinson, D. 2005. Agriculture and the Local Economy of Kings County Nova Scotia. Economics Report. NSDAM.

Statistics Canada. 2008. Value of Farm Capital—Agriculture Economic Statistics. Cat No. 21-013.

Statistics Canada. 2006. Census of Agriculture.

Statistics Canada. 2008. Agriculture Economic Statistics. Catalogue No. 21-603

Statistics Canada. 2000. Human Activity and the Environment 2000. Catalogue 11-509-XPE. Ottawa: Minister of Industry.

Statistics Canada. 1997a. Agricultural Profile of the Atlantic Provinces 1996. Cat. No. 95-175-XPB. Ottawa: Minister of Industry.

Statistics Canada. 1997b. Historical Overview of Canadian Agriculture. Catalogue No. 93-358-XPB. Ottawa: Minister of Industry.

Statistics Canada. 1996. Environmental Perspectives—Studies and Statistics. Cat. No. 11-528-XPE, No.3.

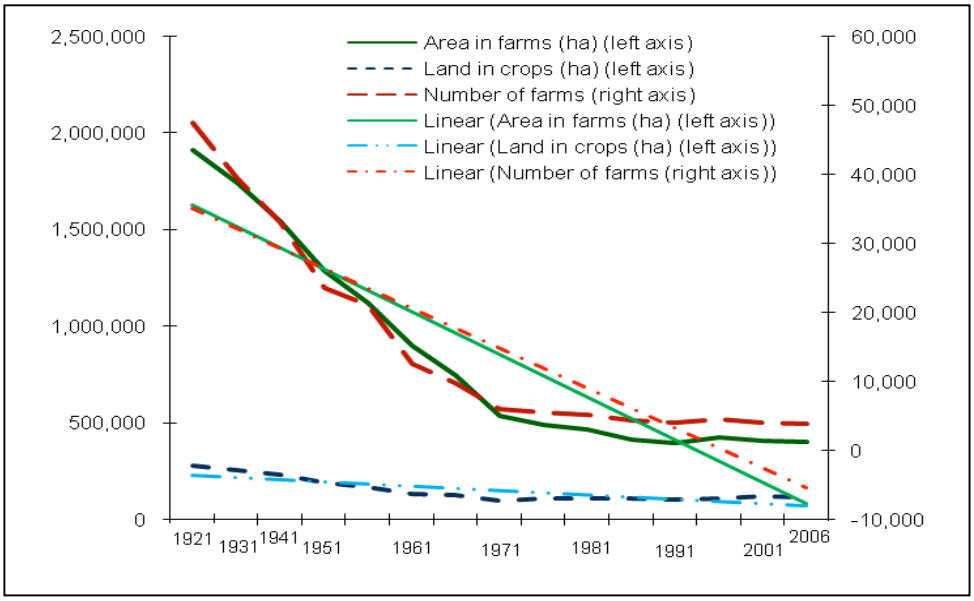
Statistics Canada. 1987. Agriculture Census 1986, Nova Scotia. Catalogue No. 96-105.

Appendix: Data Table and Trend Lines

Table 11. Nova Scotia Farm and Crop Area and Number of Farms (1921–2006)

Year	Number of farms	Area in farms (ha)	Land in crops (ha)
1921	47,432	1,911,553	278,448
1931	39,444	1,740,970	252,408
1941	32,977	1,544,542	233,072
1951	23,515	1,284,347	193,221
1956	21,075	1,123,262	168,444
1961	12,518	902,609	133,188
1966	9,621	749,435	127,129
1971	6,008	537,777	98,322
1976	5,434	493,293	111,667
1981	5,045	466,023	112,782
1986	4,283	416,507	109,512
1991	3,980	397,031	106,231
1996	4,453	427,324	112,364
2001	3,923	407,046	119,219
2006	3,795	403,044	116,609

Figure 2. NS Farm and Crop Area and Number of Farms (1921–2006), with Trendlines



Sources: number of farms from: www.statcan.ca/english/freepub/95F0302XIE/2001001/tables/html/optab13.htm#11; area in farms from: www.statcan.ca/english/freepub/95-629-XIE/1/1.5.htm#11; land in crops from: www.statcan.ca/english/freepub/95F0302XIE/2001001/tables/html/optab13.htm#TFtn.

Glossary: Definition of Census Farm

The definition of a census farm has not remained constant over the years. Changes in this definition since 1921 are summarized below. These changes do affect the comparability of the data among censuses.

In 1996 and 2001, a census farm was defined as an agricultural operation that produces at least one of the following products intended for sale: crops (hay, field crops, tree fruits or nuts, berries or grapes, vegetables, seed); livestock (cattle, pigs, sheep, horses, game animals, other livestock); poultry (hens, chickens, turkeys, chicks, game birds, other poultry); animal products (milk or cream, eggs, wool, furs, meat); or other agricultural products (Christmas trees, greenhouse or nursery products, mushrooms, sod, honey, maple syrup products).

The 1996 definition of a census farm was expanded from the definition used in 1991 to include commercial poultry hatcheries and operations that produced only Christmas trees. In 1996, this expanded definition resulted in the inclusion, for the first time, of 138 commercial poultry hatcheries and 1,593 operations across Canada that produced only Christmas trees. In all other respects, the 1996 definition was the same as the 1991 definition.

For the 1981 and 1986 Censuses, a census farm was defined as a farm, ranch or other agricultural holding with sales of agricultural products of $250 or more during the previous 12 months. Agricultural holdings that anticipated sales of $250 or more in the census year were also included.

For the 1976 Census, a census farm was defined as a farm, ranch, or other agricultural holding of one acre or over with sales of agricultural products of $1,200 or more during 1975. However, the basic unit for which a questionnaire was collected was termed an agricultural holding. This term was defined as a farm, ranch, or other agricultural holding of one acre or over with sales of agricultural products of $50 or more during the 12-month period prior to the census. At head office, the questionnaires were then divided into "census farms" and "small agricultural holdings." Small agricultural holdings were those remaining after the census farms had been removed. For data comparability purposes, however, all published 1976 Census data on the number and area of farms in this report have been tabulated according to the agriculture holding definition (i.e., with sales of agricultural products of $50 or more during the 12 months prior to the census) and not according to the census farm definition.

For the 1961, 1966, and 1971 Censuses, a census farm was defined as a farm, ranch, or other agricultural holding of one acre or over with sales of agricultural products of $50 or more during the 12-month period prior to the census.

For the 1951 and 1956 Censuses, a census farm was defined as a holding on which agricultural operations were carried out and that was (a) three acres or more in size, or (b) from one to three acres in size, with agricultural production in the year prior to the census valued at $250 or more.

The 1931 and 1941 Censuses defined a census farm as a holding of one acre or more that produced, in the year prior to the census, agricultural products valued at $50 or more, or that was under crops of any kind or used for pasturing in the census year.

The 1921 Census defined a census farm as a holding of one acre or over that produced, in 1920, crops of any kind valued at $50 or more. (Source: http://www.statcan.ca/english/freepub/95F0302XIE/2001001/notes/center.htm. Accessed August 5, 2007)