

MEASURING SUSTAINABLE DEVELOPMENT

APPLICATION OF THE GENUINE PROGRESS INDEX TO NOVA SCOTIA

The Nova Scotia Genuine Progress Index

Soils and Agriculture Accounts

Part 1: Farm Viability and Economic Capacity in Nova Scotia

1st Data Release: Kings County Genuine Progress Index

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Executive Summary: Farm Economic Viability in Nova Scotia

The ability to generate an adequate income from farming enables farmers to devote resources to quality food production and to land stewardship that is essential to maintaining the value of natural capital in agriculture.

An *inadequate* return on investment can produce a wide range of negative social and environmental effects, each of which carries significant costs. In extreme cases, when farmers cannot make ends meet, prime agricultural land may be sold and converted to other uses, resulting in the loss of a valuable natural capital asset and a decline in food security for future generations. An inadequate return on investment is therefore not sustainable in the long run from *either* an economic *or* an ecological perspective.

Although total farm cash receipts have risen 12% over the past 28 years, all other indicators of economic viability examined here are showing negative trends. If these trends continue at current rates, we are likely to see the virtual demise of several agricultural sectors in Nova Scotia, including apples, vegetables, beef and hogs.

Due to marketing boards and supply-side price controls, dairy and poultry are faring better than other sectors. Preliminary evidence also indicates that organic food producers who market directly to consumers are getting better prices for their products. Direct marketing avoids most wholesale, retail and other “middle-man” costs that normally reduce the proportion of food price sales accruing to farmers.

Like the Gross Domestic Product at the provincial and national levels, gross farm output and total farm cash receipts (the conventional indicators most commonly used to assess agricultural growth and health) can be very misleading indicators of economic wellbeing. Five additional indicators are therefore presented below that provide more accurate and comprehensive signals of farm economic health. These indicators show that farm sector economic health is in serious decline, *even* when natural resource and social health measures are not considered.

This report is the first data release in the Nova Scotia Genuine Progress Index Soils and Agriculture Accounts. Future reports, to be issued in the coming months, include assessments of soil quality, pesticide use, nutrient use, livestock yield, biodiversity, employment, community resilience, and trade in farm products.

Specific results for the five indicators of farm economic viability are summarized in the next three pages. These results have never before been assembled and publicly presented.

Until now, the farm crisis has been widely perceived as subjective complaints by farm interest groups. This is believed to be the first time in Canada that objective, quantifiable and verifiable indicators of farm economic viability are publicly available as indicators of genuine progress in agriculture. The results and time lines presented in this report were assembled from raw primary data, entered into a database, and combined for the first time into time series that can assess progress over a 28-year time span (1971-1999).

Summary of Indicators and Results

Table 1. Summary of Indicators, Viability Threshold Estimates and Results, N.S.

| Indicator | Level | Trends and Results | Viability Threshold | Formula |
|---|-------------------|---|---------------------|--|
| 1. Total farm cash receipts | Province | Increase of 12% over 28 years | Not a GPI indicator | sum of all farm cash receipts |
| 2. Net farm income | Province | Decline of 46% over 28 years | No threshold set | total farm cash receipts – total farm operating expenses |
| 3. Expense to income ratio (%) | Province and farm | Increase from 83% to 90% over 28 years | Less than 80% | (total farm operating expense and depreciation / total farm cash receipts) * 100 |
| 4. Return on investment (%) | Farm | Currently ranges from 9.7% to less than zero for surveyed farms | More than 5% | [(net income - value of unpaid labour) / (total assets - total liabilities)] * 100 |
| 5. Debt to net income ratio (%) | Province and farm | Increase from 300 to 900% over 28 years | Less than 600% | (total farm debt / total net income) * 100 |
| 6. Direct payments to producers and dependency ratio(%) | Province | Subsidies down but dependency ratio increase from 15% to 35% over 28 years. | Less than 20% | Dependency ratio = (total direct payments by government / total net farm income) * 100 |

1) Net Farm Income

Net farm income is a primary indicator of economic viability and the basis for other indicators considered here. While total farm cash receipts rose by 12%, total *net* farm income in Nova Scotia declined by 46% from 1971 to 1999. Income figures are for the province as a whole, and therefore signify declining viability for the agriculture sector as a whole. They do not provide information on individual farms. Dividing total net farm income by an estimated 4000 farms, average net farm income in the late 1990s is \$10,000 to \$12,500 per farm per year. Net farm income does not take into account expenses such as unpaid operator and family labour.

2) Expense To Income Ratio

The ratio of farming expenses to agricultural income is a vital indicator of farm viability because it highlights the margin farmers have to work with if they are not to go further into debt. The expense ratio tells us how much farmers are spending to operate the farm (e.g. hired labour, feed, fuel, and crop inputs) relative to their income from farm products and government payments. The higher the expense ratio is, the narrower producer margins are, and the more risky farming tends to become.

The sustainability threshold for the expense to income ratio of a healthy farming sector is estimated at 80%. An expense to income ratio of 100% would indicate a zero margin and no effective return on investment or the farmer's time. An expense to income ratio higher than 100% indicates negative margins and absolute losses.

In Nova Scotia the expense ratio has risen from an average of 83% in the 1970s to more than 90% in the 1990s, due both to higher input costs such as fertilizer, farm labour and farm mortgage costs, and to stagnant farm gate food prices. Price increases for food in stores *have* kept pace with increases in farm input costs, but the benefits of food price increases appear to have accrued to wholesalers and retailers and have not translated into higher prices paid to farmers.

The results indicate that prices paid to producers are inadequate and are not keeping pace with farm expenses, and that farming is becoming less economically viable over time.

3) Return On Investment

Return on investment is another key indicator of farm economic viability. Farmers invest heavily in their farm businesses, but rarely reap the rate of returns that accrue to mutual or pension fund investors, despite the long hours of work necessary to run a farm. A return on investment that is significantly below other investment opportunities discourages large investments in unprofitable farming operations. Given average pension fund returns of 10.2% between 1995 and 1999, the viability threshold is set here at 5%.

Return on investment figures for a limited number of surveyed beef, fruit, hog, and dairy farms in Nova Scotia show that only dairy farmers are making a reliable return on investment. Poultry farm returns were not available, but are likely to parallel the dairy results. Surveyed apple and beef farmers consistently show a return of less than zero. Overall trends, aside from dairy, appear to indicate declining farm sector viability, and have been identified by the Nova Scotia Federation of Agriculture as a serious problem.

4) Total Debt To Net Farm Income Ratio

The debt to net farm income ratio is an indicator of the risk adopted by the farming sector relative to the income it generates, and of the capacity of farmers to make payments on debt. If debt is going up relative to net income, the industry may not be economically robust, or it may be overcapitalized, or it may suffer from income-depressing prices that are not keeping pace with farm input costs. In many cases, a combination of all three factors may be responsible for raising the debt to net income ratio.

Based on historical Nova Scotia averages, the ratio of debt to net income in a healthy farming sector is estimated at less than 600%. In other words, total outstanding farm loans should not exceed six times total net farm income over time. In practice this sustainability threshold will vary according to the actual security of farm income. Supply-managed farms, because of their steadier and more secure incomes, could likely weather relatively higher debt levels, unless interest rates increased significantly.

In the long run, an ascending ratio over time indicates that farmers have to accept higher risks in order to achieve the same amount of net income. The risk-prone nature of farming, which is subject to major fluctuations in weather, price, trade, and pest and disease incidence, further dictates that total debt not be excessive relative to income. High overall debt levels can also contribute to cutting corners at the expense of safety and responsible land stewardship in order to make payments on outstanding debt.

Total farm debt in Nova Scotia is currently more than 900% of total net farm income, a three-fold increase in less than 30 years. The average debt to net income ratio in the 1970s was about 300%.

5) Direct Government Payments To Producers and “Dependency Ratio”

If market mechanisms worked perfectly, farmers would be paid enough for the food they produce so that farm subsidies and other direct government payments to farmers would not be necessary. Given that the price index for farm products is stagnant relative to both farm input costs and store food prices, direct government payments to farmers can be considered an indirect subsidy to those who buy food from farmers (consumers, processors, wholesalers, and retailers), or to those who sell inputs to farmers. Direct government payments to producers should not, therefore, be considered artificial supports for farmers alone, but compensation for market failures.

Since 1971, total net farm income *before* government payments declined by nearly 60% from an average of about \$60 million to \$25 million in constant 1997 dollars. This has necessitated increasing dependence on government payments. . However, direct payments to farmers also declined from an average of \$17 million in the early 1980s to \$11 million in the late 1990s (in constant 1997 dollars). Taking both trends into account, the “dependency ratio” (direct government payments to farmers as a proportion of total net farm income) has more than doubled since 1971, as a result of a faster decline in income relative to the change in direct payments.

The declining reliability of market income and the consequent increase in vulnerability and loss of farm independence are indicators of the declining economic viability of provincial agriculture.

Kings County Pilot Survey

An in-depth pilot survey of Kings County farmers in the spring of 2000 confirmed that overall economic viability, and the need for a fair value paid for farm products and for a better return on investment are major concerns for growers. The small sample size of the pilot survey does not allow definitive conclusions, but three comments that illustrate farmers’ perceptions of society’s response to the farm crisis are reproduced here in order to put a human face on the statistical analyses and conclusions in this report:

- *“Society doesn’t recognize the work, risk, and costs to the farmer. It’s the middleman that gets the raise.”*
- *“Farmers are feeding society without being financially compensated for the work that goes into it. This work is not recognized by society.”*
- *“There is not enough knowledge in society about the cost, investment, and risk involved with farming. Maybe if the trucker’s strike [at the NB/NS border] had gone on for a few more days, consumers would become more aware of the importance of local farms.”*

The only sources of stability and adequate income identified in the survey were (1) quota systems in the poultry and dairy sectors and (2) direct marketing of organically grown food to consumers. Producer cooperatives also appear to carry promise in increasing farmer bargaining power with wholesalers and retailers and to increase farm gate prices.

GPI Atlantic is currently working with Kings County community groups to produce indicators of wellbeing and sustainable development at the community level. Because Kings County is the agricultural heartland of Nova Scotia, this report also constitutes the first data release for the Kings County Genuine Progress Index.

Acknowledgments

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We are also grateful to the Rural Secretariat, the Canadian Rural Partnership, the National Crime Prevention Centre's Business Action Program, the Canadian Population Health Initiative, Human Resources Development Canada, Central Kings Community Health Board, Eastern Kings Community Health Board, and Kentville Rotary Club, for their financial support of the Kings County Genuine Progress Index, for which this report is the first data release.

Without that support, as well as generous in-kind assistance from Statistics Canada, the Nova Scotia Citizens for Community Development Society, Kings Community Economic Development Agency, the Western Valley District Health Authority, Dalhousie University's Population Health Research Unit, St. Mary's University's Time Use Research Program, and numerous community partners and individuals, this enterprise and the Kings County GPI as a whole would not have been possible.

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Members of the Nova Scotia Federation of Agriculture (NSFA) Council of Leaders provided very constructive and helpful feedback and suggestions. The executive director of the NSFA, Laurence Nason, was also most helpful in providing materials and advice. As much of the NSFA feedback as possible was incorporated into this report. Other helpful insights from the NSFA Council of Leaders will be addressed in future reports.

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These reviewers provided critical feedback, and do not necessarily endorse the findings or conclusions of this report. Because the development of the Genuine Progress Index is a work in progress, and because GPI Atlantic welcomes improvements in methodologies, data sources and data analysis, we have included pertinent reviewer comments in an appendix to this report. We hope this will encourage further discussion of the indicators, measurement methods, data sources, results and interpretations.

Ronald Colman, Wendy Johnston, and Fredr'c Morgan also contributed significantly to this report, and the author sincerely thanks them.

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

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GPI Atlantic can only hope that the results of its research can repay some of the support received and make a modest contribution to Statistics Canada's own ground-breaking work in environmental and natural resource accounting and to the National Round Table's current environmental and sustainable development indicators initiative.

Leonard Poetschke, on behalf of the Nova Scotia Citizens for Community Development Society initiated and spearheaded the development of a community Genuine Progress Index in Kings County. Dozens of community organizations and Kings County citizens participated actively in the development of the Kings County GPI, and generously gave their time in numerous meetings and discussion groups that laid the essential groundwork for this project.

In particular, a dedicated Soils and Agriculture committee, composed mainly of Kings County farmers, met regularly in Kentville to construct the survey that is the basis of chapter 3 of this report and to discuss preliminary results. The spirited committee discussions on sustainable agriculture demonstrated that the real results of the GPI work are actually in the process, with the interchanges among farmers on this committee providing a genuine learning experience that grounds this work in reality and will

hopefully translate into stronger farm viability. In particular, we want to thank Kings County farmer Bill Swetnam for his leadership in the Kings GPI Agriculture process.

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Inspiration for the Nova Scotia Genuine Progress Index came from the ground-breaking work of Redefining Progress, which produced the first GPI in the United States in 1995. Though GPI Atlantic's methods differ in many ways, particularly in not aggregating index components for a single bottom line, we share with the original GPI the attempt to build a more comprehensive and accurate measure of well-being than can be provided by market statistics alone. GPI Atlantic also gratefully acknowledges the pioneers in the field of natural resource accounting and integrated environmental-economic accounting on whose work this study and the GPI natural resource accounts build.



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Glossary and Acronyms

A AFC Agriculture and Agri-Food Canada

AIDA Agriculture Income Disaster Agreement

Agriculture Economic Statistics is a compendium of agricultural statistics put out by Statistics Canada. It is the most reliable source of up-to-date economic information, and is subject to intercensal revisions.

Cash Receipts At the provincial level, total farm cash receipts from farming operations include receipts from crop sales (including non-food items such as forest products and Christmas trees), receipts from all livestock and livestock products sales (including hatchery income, pregnant mare's urine, furs, horses, and embryos), and direct payments to producers from various government programs (into which farmers may or may not pay). Hatchery and Christmas tree income were only added after 1996. Figures are obtained from Statistics Canada, *Agriculture Economic Statistics*.

Debt At the provincial level, total farm debt includes debts outstanding from a number of different institutions. These are chartered banks, federal government agencies, provincial government agencies, credit unions, insurance and trust companies, private individuals and loan companies. Total debt includes advance payment programs. Figures are obtained from Statistics Canada, *Agriculture Economic Statistics*.

At the farm level, total farm debt is the sum of long term loans and short term operating loans. These are recorded in detailed financial surveys of a sample of commercial farms. The survey results are presented in *Farm Management Analysis Project* reports, published by the Nova Scotia Department of Agriculture and Marketing.

OECD Organization for Economic Co-operation and Development

Farm Unless otherwise stated, a 'farm' is a census farm, which means "an agricultural operation that produces at least one of the following products intended for sale: crops; livestock; poultry; animal products; or other agricultural products."

FFA Feed Freight Assistance

Farm Management Analysis Project (FMAP) reports are published by the Nova Scotia Department of Agriculture and Marketing Business and Economics Section. Figures from these reports do not represent provincial averages for each sector surveyed. They represent averages of the surveyed farms. The data in them nevertheless provide important detailed information which can give a sense of the financial state of some farms in Nova Scotia.

Gross Domestic Product (GDP) The most important item in the National Income and Product Accounts (NIPA), GDP measures the nation's total output of goods and services and the total income of the nation generated by that output. It measures the sum of the dollar values of consumption, gross investment, government purchases of goods and services, and net exports produced within a nation during a given year, where these transactions are valued at market prices. It also represents the incomes earned as wages, profits, and interest, as well as indirect taxes. It is a useful indicator of the value of total goods and services produced, but was not intended by its architects to be used as measure of societal wellbeing, as it frequently is today.

Genuine Progress Index (GPI) The GPI is a measure of wellbeing and sustainable development presently under construction, that includes explicit valuations of natural capital and social assets. The GPI measures the depletion and degradation of natural and social capital as depreciation, and it values restoration efforts as "re-investments." This allows the ecological and socioeconomic sustainability of current harvesting practices and consumption patterns to be assessed.

Income in kind This category of non-cash income is used by Statistics Canada to add farm produced goods consumed by the farm family into 'net income' assessments.

Multiplier effect refers to the number of times a primary economic activity is multiplied in the local economy. For example, if each farm employs an average of four full-time people, the direct employment multiplier effect is 4. If there are 40 processing jobs created per farm, this would be a multiplier effect of 10 between farm employees and processing employees. If Nova Scotia has 4,000 farms and 12,000 employees in the agriculture sector, the farm to employment multiplier is 3. If a farmer spends \$100,000 in the local economy, and that in turn generates \$200,000 worth of business (the farmer's accountant buys lunch and the machinery dealer buys a car, etc), then the economic multiplier effect would be 2.

Net income Net farm income at the provincial level is determined in the following way:

+ total cash receipts from farming operations
- operating expenses after rebates
+ income in kind
- depreciation charges (on buildings and machinery)
+ value of inventory change (either positive or negative)

= net farm income

Figures are obtained from Statistics Canada, *Agriculture Economic Statistics*. Net farm income for surveyed farms is determined in exactly the same way except there is no accounting for income in kind (which is usually quite minor). The survey results are presented in *Farm Management Analysis Project* reports, published by the Nova Scotia Department of Agriculture and Marketing.

NISA Net Income Stabilization Account

NSDAF Nova Scotia Department of Agriculture and Fisheries, formerly the Nova Scotia Department of Agriculture and Marketing

NSDAM Nova Scotia Department of Agriculture and Marketing, recently changed to the Nova Scotia Department of Agriculture and Fisheries (NSDAF)

Operating Expenses and Depreciation Charges At the provincial level, this figure includes all farm operating expenses (such as fuel, taxes, wages, feed, etc). It also includes payments to insurance and stabilization programs. It does not include capital purchases of machinery, land, barns etc, but it *does* include interest on loans, and depreciation on buildings and machinery. Rebates on such items as interest or fertilizer are subtracted from operating expenses. This figure also does not include the costs of unpaid labour. Figures are obtained from Statistics Canada, *Agriculture Economic Statistics*.

Payments At the provincial level, ‘payments’ include payments enhancing receipts plus rebates reducing expenses. Producer contributions are not included. ‘Payments’ do not include indirect payments, transfer payments, or capital grants. Figures for direct program payments to producers *include*:

- (1) subsidies to encourage production;
- (2) subsidies to compensate producers for low market returns;
- (3) payments to stabilize income;
- (4) subsidies to reduce expenditures on farm inputs; and
- (5) payments to compensate producers for crop or livestock losses.

These figures do not represent total government expenditures under all programs. The figures *exclude*:

- (1) indirect payments (reduced property tax, reduced transportation costs, reduced fuel costs, reduced interest costs, as well as payments for research, marketing, and promotion);
- (2) transfer payments (e.g. EI payments or training grants); and
- (3) capital grants (e.g. to improve storage facilities, breeding stock, purchase of equipment).

Figures are obtained from Statistics Canada, *Agriculture Economic Statistics*.

Total Support Estimate (TSE) This OECD indicator refers to the annual monetary value of all gross transfers from taxpayers and consumers arising from policy measures that support agriculture, net of the associated budgetary receipts to government from farmers. When expressed as a percentage of the GDP, the TSE percentage indicates the proportion of total spending that this overall support for agriculture represents for the economy as a whole.

1. Farm Viability and Economic Capacity: Issues and Trends

"Sustainable agriculture has to be economically viable...Farmers put [economic viability] high on the list." Kings County vegetable farmer (1994)

The ability to generate an adequate income from farming enables farmers to focus on quality food production and land stewardship. An *inadequate* return on investment, by contrast, can produce a variety of negative social, economic and environmental effects, each of which carries significant costs:

- Other business generated by farming activity may slump;
- The quality and quantity of food produced may decline;
- Farmers may be forced to cut corners, thereby compromising safety;
- Investments in soil conservation, waste handling, or adequate animal housing may become impossible;
- Potential growers may choose other occupations; and
- There may be declines in new entrants or farm numbers, and potential conversion of prime agricultural land to urban and other uses.

Because it impacts every other area of agriculture and the food security of future generations, the basic economic viability of farming is a key indicator of genuine progress in the GPI.

Any measure of progress must answer the question ‘progress towards what?’ This question necessarily involves value choices. In the Genuine Progress Index, those values are explicit. For example, livelihood security, peaceful and secure communities, a healthy population, clean air and water, healthy natural resources and other core values represent goals on which there is a broad social consensus. Similarly, the food security of future generations is a fundamental social objective that depends on a healthy farm sector. For this reason, the health and economic viability of agriculture represents a core social value that defines an explicit goal in the GPI against which progress can be assessed.

Economists often express discomfort with such values. But it must be acknowledged that when the Gross Domestic Product (GDP) is commonly used, in a way never intended by its architects, to assess how “well off” we are as a society, it is also not value-free. *More* spending and *more* output are considered to be “better” for social wellbeing. Because the Genuine Progress Index includes social and environmental values and objectives not considered in standard economic growth measures, “*less*” may sometimes be “better.”

For example, less crime, less pollution, less sickness and less greenhouse gas emissions are signs of progress in the GPI, because peace, clean air and water, health, and a stable climate are core values in the index. By contrast, when economic growth is the primary measure of wellbeing, increases in crime, pollution, sickness and fossil fuel combustion are all misconstrued as contributions to prosperity and wellbeing, simply because they generate spending, which in turn is taken as a sign of economic “health.”

In sum, there is no escape from the value system underlying any measure of progress. We state this explicitly in the introduction in order to explain why the health of the agricultural sector is a core value and objective in the Nova Scotia Genuine Progress Index. We believe there is a consensus in Nova Scotia society that agriculture should survive in the province, and that a viable farm sector is a basic indicator of genuine progress towards this objective. That is the fundamental premise for the data presented in this report.

Because it impacts every other aspect of agriculture, farm viability is the first release of the GPI Soils and Agriculture Accounts, and is assessed according to the five key indicators described below. These indicators can be measured on a regular basis to determine whether farming is becoming more or less viable. The five indicators can also be used as annual assessments of progress or decline in the agriculture sector, and as guidelines to aid policy development. Future GPI releases will focus on ecological and social indicators of progress in agriculture.

The five indicators suggested in this report are also particularly useful at this moment in Canadian history. There is continuous debate about free trade in farm products and the role of government subsidies. Farm economic troubles have been on the front pages of newspapers for many months. Farmers have taken to the streets in protest. There are warnings from farm representatives about the demise of the family farm.

But farmer concerns are almost always presented as anecdotal evidence and “farmer complaints” from a single-issue interest group. There is almost no reference to objective, measurable indicators that signify *society’s* interest, concern or stake in a viable farming sector. The five indicators suggested here can be used to provide a more objective and quantifiable reference point for discussions that can reduce the emotive element, signal to farmers the shared and vested interest of Canadian society in food security and a viable agriculture sector, and provide practical and concrete guidelines for policy-makers.

The Nova Scotia GPI study presented here is intended as a pilot for the country as a whole. Indeed, it is clear that the trends identified in this report are not confined to this province. On the whole, increasing concentration in the retail and processing sectors, increases in farm input costs, and low commodity prices have negatively affected most Canadian farmers’ bottom line. Many farmers both in Canada and in the U.S. industrial farming sector have begun to ask whether it is ‘worth it’ to farm. In general, an objective examination of broad trends in farm economic indicators for Nova Scotia confirms what farmers have been saying for years, and the overall picture that emerges is not encouraging.

However, the same analysis finds that the broad averages conceal considerable diversity within the farming sector itself. Organic farming, for example, appears to be flourishing, even though it is not immune from the negative price trends affecting agriculture as a whole.¹ Supply-managed commodities like dairy and poultry are also faring better than

¹ Proctor, S. “Change or go under, farmers told. Corporate agriculture driving independents out – speaker,” *Sunday Chronicle Herald*, Halifax, December 3, 2000, p. A7.

unregulated commodities such as fruit, vegetables, or beef. In the unregulated sectors, farmers who market directly to consumers tend to be more satisfied with their earnings than those who sell to wholesalers or processors.²

The differences in economic outcomes for different agricultural sectors and marketing mechanisms have important policy implications and suggest ways of improving overall farm viability both in Nova Scotia and beyond. The results presented here are therefore intended to be used in practical ways to build on existing strengths in the farm sector and to overcome identified weaknesses.

1.1 Indicator Selection, Viability Thresholds, and Results

In order to choose meaningful indicators of genuine progress, we must ask which economic measures accurately indicate ‘flourishing’ or ‘healthy’ agriculture. Some of the indicators suggested in this analysis are well established, while others require new ways of measuring wellbeing and economic health.

As noted above, the Genuine Progress Index, or any other measure of progress, implies certain values, goals and objectives against which current trends can be measured. In other words: are we moving towards or away from the kind of society we want to leave to our children? As mentioned, these goals can be expressed in very broad societal terms (e.g. livelihood security, population health, peaceful communities, environmental quality, educational attainment), or in very specific objectives for particular indicators.

For this first section of the GPI Soils and Agriculture Accounts, the broad goals are basic livelihood security for farmers, and a return on investment sufficient to encourage investments in quality food production and responsible land stewardship. The following indicators are expressed in terms of specific sustainability objectives. Sustainability is here defined very simply as the capacity to sustain farm operations over time in an ecologically and socially beneficial manner, so that farming will remain economically viable in the long term.

If farming ceases to be viable, farmers will likely abandon their operations, resulting in conversion of agricultural land to other uses, which in turn poses a threat to the wellbeing of rural communities. Because this particular analysis deals with a fundamental bottom line, ‘sustainability’ is therefore interchangeable in this discussion with ‘economic viability’. If farming is not economically viable, all other considerations are moot.

Using the indicators that follow, current trends are assessed against estimated minimum objectives, expressed as thresholds of economic viability. ‘Sustainability thresholds’ proposed here are based as far as possible on thresholds established in the literature. When no established thresholds for sustainability (or viability) exist, we have chosen thresholds that are both achievable (i.e. they *have* been achieved in representative times

² Scott, J. et. al. 2000. *Agriculture in Kings County: Are We Making Genuine Progress? Report of the preliminary farmer survey and statistical review*. Available from the GPI web site: www.gpiatlantic.org

and places) and/or necessary for long-term viability. Establishing such thresholds, of course, is part of the discussion that must take place when proposing new indicators of real progress. The thresholds proposed here may require adjustment over time as conclusions from new studies and actual experience are incorporated into the analysis.

Later reports assessing the sustainability of natural resource use expand the definition of sustainability to assess nature's 'carrying capacity', and thus consider the capacity of a finite resource base to sustain a certain level of human economic activity. This broader definition is necessary whenever the human economy is examined in relation to the encompassing ecosystem. Here, however, economic sustainability is assessed in narrower terms -- as the capacity of farming operations to provide adequate livelihood security and return on investment for operators over time.

All figures used in this report have been adjusted for inflation using the Nova Scotia Consumer Price Index, and are shown in 1997 dollars for comparison purposes.

In Table 1, selected viability indicators, results, thresholds and formulae are summarized. Each indicator is fully explained and footnoted in chapter 2.

Table 1: Summary of Indicators, Viability Threshold Estimates and Results

| Indicator | Level | Trends and Results | Viability Threshold | Formula |
|---|-------------------|---|---------------------|--|
| 1. Total farm cash receipts | Province | Increase of 12% over 28 years | Not a GPI indicator | sum of all farm cash receipts |
| 2. Net farm income | Province | Decline of 46% over 28 years | No threshold set | total farm cash receipts – total farm operating expenses |
| 3. Expense to income ratio (%) | Province and farm | Increase from 83% to 90% over 28 years | Less than 80% | (total farm operating expense and depreciation / total farm cash receipts) * 100 |
| 4. Return on investment (%) | Farm | Currently ranges from 9.7% to less than zero for surveyed farms | More than 5% | [(net income - value of unpaid labour) / (total assets - total liabilities)] * 100 |
| 5. Debt to net income ratio (%) | Province and farm | Increase from 300 to 900% over 28 years | Less than 600% | (total farm debt / total net income) * 100 |
| 6. Direct payments to producers and dependency ratio(%) | Province | Subsidies down but dependency ratio increase from 15% to 35% over 28 years. | Less than 20% | Dependency ratio = (total direct payments by government / total net farm income) * 100 |

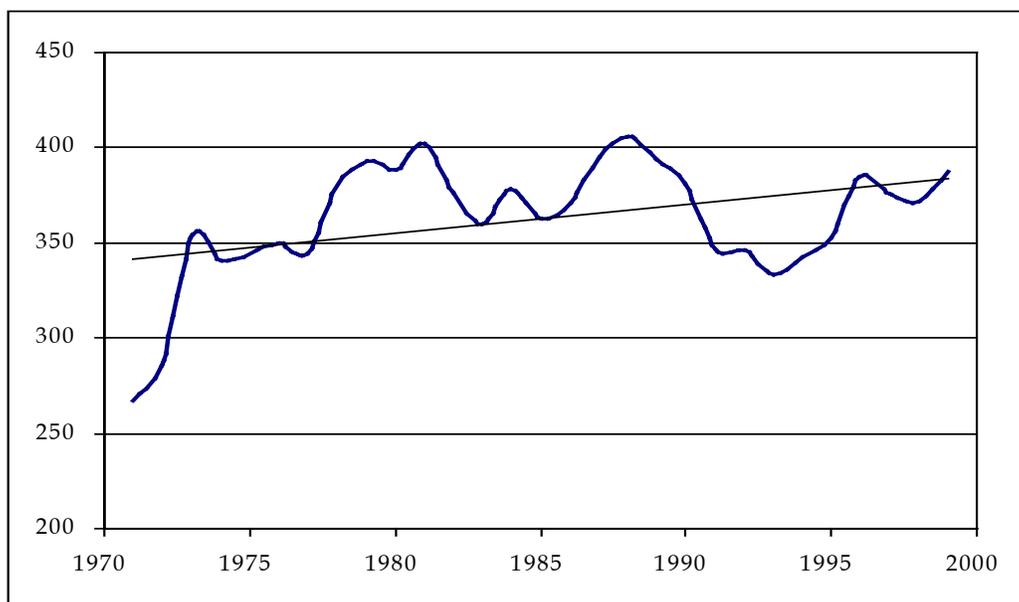
2. Economic Sustainability Indicators and Thresholds

2.1 Total Farm Cash Receipts³

Typically, ‘total farm cash receipts’ are used as an overall indicator of farm sector growth and health. ‘Total farm cash receipts’ include receipts from all sales of farm products plus direct payments (subsidies) from government, but do not include off-farm income.

Indeed the use of ‘total farm cash receipts’ as an indicator of farm financial health shares the shortcomings of the use of GDP as an indicator of prosperity at the provincial or national level. In both cases, total sales are summed without accounting for the productive, ecological or social effects of those sales, without netting out costs, and without qualitative distinctions. Although most economists are aware of the pitfalls of basing analyses of ‘progress’ on such incomplete summary figures, there is still a widespread assumption that increases in total sales indicates overall prosperity.

Figure 1. Total Farm Cash Receipts, Nova Scotia Farms (1971-1999)
(\$1997 millions)⁴



Source: Statistics Canada, *Agriculture Economic Statistics*

Figure 1 shows that total Nova Scotia farm cash receipts have increased from an average of about \$340 million to about \$380 million over the last 28 years on a constant dollar basis. Farm cash receipts in the province in 1999 were about 5% below peak levels in the

³ See Appendix III for reviewer comments on this section.

⁴ The trend line in this figure is shown as a straight black line.

early and late 1980s.⁵ Based on this indicator alone, there might appear to be little cause for concern, and certainly no “crisis” to correspond with farmers’ expressed fears.

Starting in 1996, Statistics Canada's farm cash receipt figures included farm income from Christmas trees and hatcheries. Therefore recent figures are not strictly comparable with earlier figures, and the modest increase in Nova Scotia farm cash receipts from 1995 to 1996 indicated in Figure 1 may be the result of this accounting artifact rather than signifying any real increase in income. The fact that cash receipts levelled off after 1996 makes this hypothesis likely. If the apparent increase in farm cash receipts between 1995 and 1996 is indeed an accounting artifact, then total farm cash receipts have actually stagnated since the mid-1970s, and declined significantly since the 1980s.

But total cash receipts or current income alone can be a very misleading indicator of economic wellbeing. Five additional and more accurate indicators of farm viability are therefore presented below, showing that other measures of farm sector economic health are in steady decline. Certainly these measures are not keeping pace with the possible marginal upward trend in total cash receipts indicated in Figure 1 or the more significant upward trend in farm output⁶. This decline in farm viability and sustainability exists *even* when natural resource health and ecological values are not considered.⁷

2.2 Net Farm Income

Net farm income is a primary indicator of farm viability and the basis for the other indicators considered here. Net farm income at the provincial level is determined in the following way:

$$\begin{aligned} &+ \text{total cash receipts from farming operations} \\ &- \text{operating expenses after rebates} \\ &+ \text{income in kind} \\ &- \text{depreciation charges (on buildings and machinery)} \\ &+ \text{value of inventory change (either positive or negative)} \\ \hline &= \text{net farm income} \end{aligned}$$

Figure 2 shows that total net farm income for Nova Scotia farms has varied considerably between 1971 and 1999⁸, with a general downward trend indicated by the trend line. Total net farm incomes between 40 and 50 million dollars in the late 1990s translate into a per farm net income of only \$10,000 to 12,500 per year if there are 4,000 farms in Nova Scotia, as indicated by the 1996 census. In 1997, a total net farm income of \$31 million

⁵ Statistics Canada, *Agriculture Economic Statistics*, catalogue 21-603-UPE, ‘Farm Cash Receipts from Farming Operations’ tables: latest update, June 2000.

⁶ David Robinson, NSDAF economist, *personal communication*.

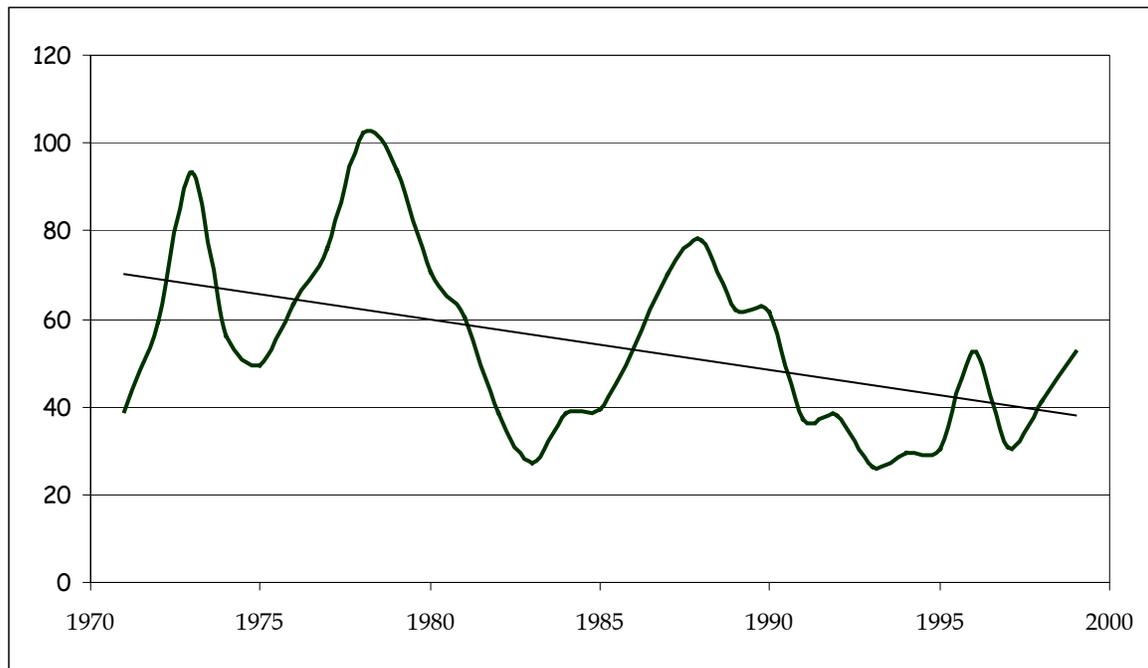
⁷ See True Value Tables in Appendix II which outline many indicators that should be measured as indicators of sustainability and long-term economic viability, but are not yet included in this preliminary assessment. It is hoped that future updates of this report will include more of these important indicators.

⁸ Net Farm Income figures are from Statistics Canada, *Agriculture Economic Statistics*, catalogue 21-603-UPE, ‘Net Farm Income’ tables: June 2000 latest update.

would have translated into a yearly income of \$7,750 per farm (assuming 4,000 farms), and a weekly income of \$149. In 1999, a total net farm income of \$53 million would have translated into a yearly income of \$13,250 per farm (assuming 4,000 farms), and a weekly income of \$255.

Although net farm income is one of the most critical farm viability indicators, no separate sustainability threshold has been established for it, as it forms the basis of the remaining indicators, which do have proposed thresholds values.

**Figure 2. Total Net Farm Income, Nova Scotia Farms, 1971-1999
(millions of \$1997)⁹**



Source: Statistics Canada, *Agriculture Economic Statistics*.

In sharp contrast to total farm cash receipts, which have risen by 12%, ***net farm income has declined by 46%*** during the same 28-year period. Because these are total figures for the province, they signify the declining economic viability of agriculture as a whole and do not provide information on the viability of particular industry sectors or farms.

It is important to distinguish between farmers' 'net farm income' and corporate 'net income' (also called 'profit'). Corporate net income (profit) is calculated after everyone - workers, managers, and the CEO -- is paid. By contrast, net farm income is calculated *before* any allowance is made for the labour or management contributions of farm

⁹ The trend line is shown as a thin, straight line on the figure.

operators and family members.¹⁰ Therefore, net farm income is the return to operator and family labour and management, rather than a profit figure. When farm operator and family labour and management time are factored in, the net farm income often becomes a negative figure.

Another weakness associated with the net farm income indicator is that it is incomplete because it does not count all expenses. It was noted above that farm operator and family labour and management are not counted; but neither are interest on equity (an opportunity cost), or changes in the land's productive capacity. When *all* the costs are counted, an unregulated commodity such as apple production proves to have considerable negative income.

The calculations presented in this section are based on Option 2 in Table 2 below, which excludes several key costs. But this table indicates that there are a number of different ways to calculate net farm income, using apple production as an example.

¹⁰ National Farmers Union, 2000. *The Farm Crisis, EU Subsidies, and Agribusiness Market Power*. Brief presented to the Senate Standing Committee on Agriculture and Forestry, Ottawa, Ontario, February 17, 2000.

Table 2: Five Different Ways to Measure Net Income of Apple Operations
(Average Annual Net Income per Farm, 1997) (Bracketed figures represent losses.)

| Option | Calculation | "Income" ¹¹ |
|--------|---|--|
| 1 | All revenues - some expenses. The expenses do not include building, equipment and machinery depreciation, inventory changes, unpaid operator and family labour, or interest on equity. They also do not include changes to the productive capacity of the land. | \$4,315 |
| 2 | All revenues – some expenses. The expenses include building, equipment and machinery depreciation, and inventory changes, but do not include unpaid operator and family labour, or interest on equity. They also do not include changes to the productive capacity of the land. | (\$9,056) |
| 3 | All revenues - most expenses. The expenses do include building, equipment and machinery depreciation, inventory changes, unpaid operator and family labour, and interest on equity. They do not include changes to the productive capacity of the land. | (\$29,040) |
| 4 | Food product revenues only - most expenses. This is the same as option 3, but subsidies have been removed from revenues. This gives a more realistic picture of real <i>market</i> income from the actual sale of food products, and of actual farm economic viability independent of government subsidies. | (\$36,905) |
| 5 | Food product revenues only - all expenses. This is the same as option 4, but changes in the productive capacity of the land have been included. This would be the most realistic picture of real income from the sale of food products because it also includes all real costs. With option 5, soil-building programs or other major expenditures which can increase future productive capacity would be given credit. On the other hand, 'running down the farm' would be shown as a loss. | Not currently calculated but a more appropriate GPI indicator. |

Source: FMAP survey data of 14 fruit growers in Nova Scotia.¹²

¹¹ Figures in parentheses are negative values.

¹² Anonymous. 1998. Tree Fruit Management Analysis Project 1997. Nova Scotia Department of Agriculture and Marketing, Business Management and Economics Section and the Nova Scotia Fruit Growers Association.

2.3 Expense to Income Ratio¹³

The ratio of farming expenses to agricultural income is important because it highlights the margin that farmers have to work with if they are not to go further into debt, and represents a *net* assessment rather than a *gross* one. The expense ratio tells us how much farmers are spending to operate the farm (e.g. costs of labour, feed, fuel, and crop inputs) relative to their income from farm products. Operating expenses do not include operator¹⁴ wages. The ratio is determined using the following formula:

$$\text{Expense to income ratio (\%)} = \frac{\text{total farm operating expenses and depreciation}}{\text{total farm cash receipts}} \times 100$$

If the price index for farm inputs increases more steeply than the index for farm products (see Figures 5 and 6 below), then expenses will rise relative to income unless costs can be reduced in other ways. The higher the expense ratio is, the narrower producer margins will be, and the more risky farming tends to become.

The sustainability threshold for the expense to income ratio of a healthy farming sector is here estimated to be 80%, based on comparable NSDAF estimates (see below). An expense to income ratio of 100% would indicate a zero margin and no effective return on investment or the farmer's time. An expense to income ratio higher than 100% indicates negative margins and absolute losses.

Farm financial analyses carried out by the NSDAF use a similar indicator called the 'operating expense ratio'.¹⁵ That ratio, however, does not include interest and depreciation as expenses. An operating expense ratio, as defined by NSDAF, is considered to be 'good' if it is less than 60%, and 'poor' if it is over 75%.

GPI Atlantic's expense to income ratio *does* include interest and depreciation charges as expenses, and consequently raises the threshold for viability to 80%. We include the interest and depreciation charges rather than leaving them out because the costs associated with owning the farm and other capital equipment are legitimate costs that impact farm viability, and therefore represent a more realistic reflection of real costs as actually experienced by the farmer.

Farm operating expenses and depreciation charges include gross operating expenses (including crop insurance and stabilization premiums), minus rebates, plus depreciation on buildings and machinery. Depreciation or appreciation on land is not included¹⁶.

¹³ See Appendix III for reviewer comments on this section.

¹⁴ 'Operator' is a term used to describe the person or people who run the farm. They are not 'employees'.

¹⁵ For example, NSDAM, *Farm Management Analysis Project Dairy Results: 1997*, Business Management and Economics Section, Truro, 1999, p.3.

¹⁶ Statistics Canada, *Agriculture Economic Statistics*, catalogue 21-603-UPE, 'Farm Operating Expenses and Depreciation Charges' tables: June 2000 update ('96-'99), June '99 update ('83-'95), and June '97 update ('71-'82).

The income side of the ratio is derived from ‘total farm cash receipts’ (see Figure 1). This includes receipts from all sales of farm products plus direct payments (subsidies) from government, but does not include off-farm income. As noted above, income from Christmas trees and hatcheries was added to cash receipt figures starting in 1996¹⁷.

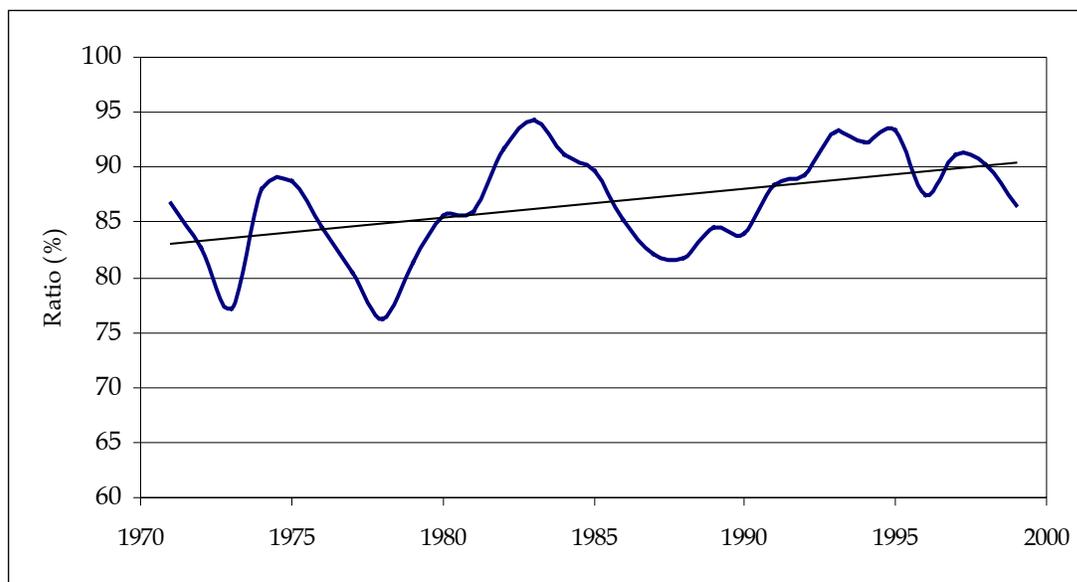
The cost of unpaid labour and soil capital value should also be reflected in the ratio, and should therefore be accounted for in future updates of this report. For the present, GPI Atlantic is building the various components of the GPI Soils and Agriculture Accounts one step at a time. When all components are complete, it will be possible to recalculate the expense to income ratio and other economic indicators from a full-cost accounting perspective that includes social and ecological benefits and costs. In the meantime the expense to income ratio is assessed following the narrower, conventional economic accounting mechanisms.

An expense to income ratio of 80% or less is particularly important for the farming sector in order to account for the inherent risks associated with farming above and beyond normal business risks. These risks include weather fluctuations, crop and livestock losses from pests and diseases, trade policy decisions, and the effect of production and policies in other countries. To accommodate these fluctuations over which farmers have no control, a minimum 20% margin is considered essential for the farming sector. Figure 2 demonstrates just how sharp these fluctuations actually are in the Nova Scotia farm sector.

In Nova Scotia the expense to income ratio has risen from an average of 83% in the 1970s to more than 90% in the 1990s (Figure 3). This indicates that prices paid to producers are inadequate and are not keeping pace with farm expenses. Whatever the case for higher or lower assessments of the sustainability threshold, the trend line over a 30-year period clearly indicates that ***farming is becoming less economically viable over time***.

¹⁷ Cash receipt figures are from Statistics Canada, *Agriculture Economic Statistics*, catalogue 21-603-UPE, ‘Farm Cash Receipts from Farming Operations’ tables: June 2000 update ('96-'99), June '99 update ('83-'95), and June '97 update ('71-'82).

Figure 3. Expense to Income Ratio (%), Nova Scotia Farms (1971-1999)¹⁸



Source: Statistics Canada, *Agriculture Economic Statistics*.

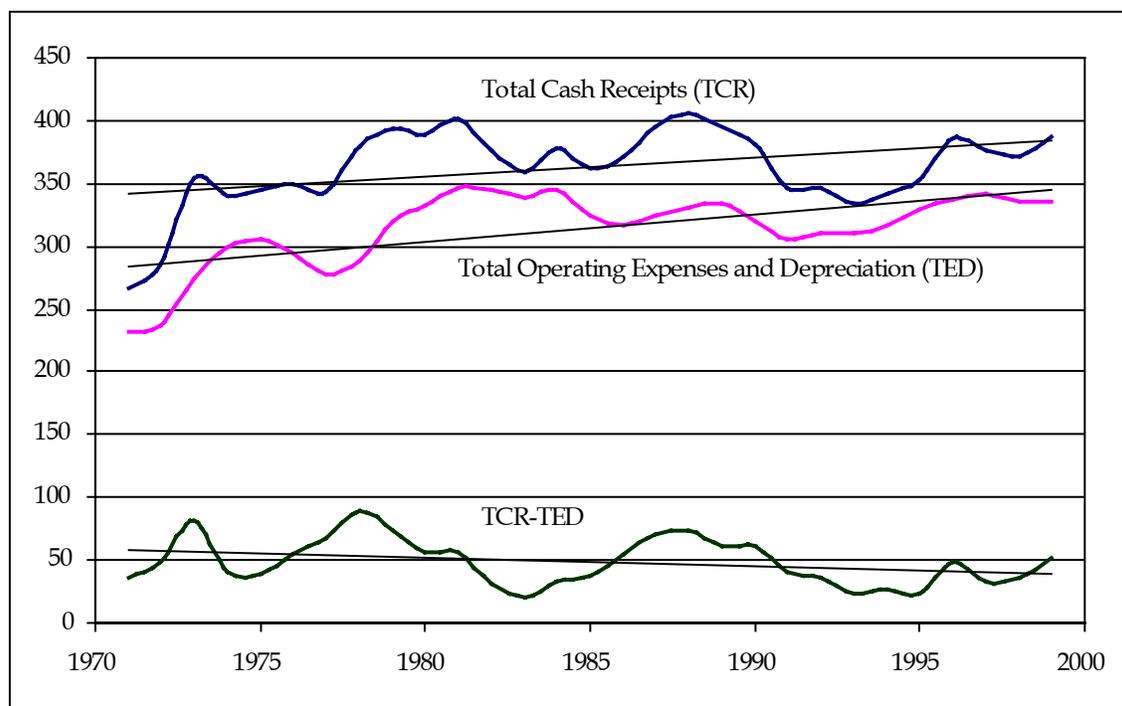
The converging income and expense lines in Figure 4 show that the increase in farm income over time has not kept pace with increases in the cost of farming. Total farm cash receipts have increased by about 12% in constant dollars since the early 1970s while operating expenses and depreciation costs have increased by nearly 25%. As a consequence, farming margins (total cash receipts minus total operating expenses and depreciation) have been substantially reduced. What is referred to here as “farming margins” is similar to the ‘net farm income’ described in section 2.2 above.

These *net* assessments (expense to income ratio and net farm income) are far more realistic indicators of farm economic viability than the total farm cash receipts that contribute to the GDP and that are generally used to measure economic wellbeing.

If current trends continue, farming as a whole in Nova Scotia will slip below the break-even point by about mid-century, indicating the ***potential demise of the agricultural industry in this province***. This demise will occur more quickly if risk factors such as climate and price fluctuations continue to play havoc with margins. It will (and in many cases already has) become more profitable to convert agricultural land to other uses. That, in turn, has serious implications for future food security as the province becomes increasingly dependent on food imports that are subject to supply and price fluctuations beyond local control.

¹⁸ The trend line in this figure is shown as a thin, straight black line.

Figure 4. Total Cash Receipts, Operating Expenses & Depreciation, and Margins (the difference between income and expenses), Nova Scotia Farms (1971-1999)¹⁹ (\$1997 millions)²⁰



Source: Statistics Canada, *Agriculture Economic Statistics*.

These composite provincial figures, however, conceal important differences among different farming sectors. At the farm level, we see that expense to income ratios vary significantly from one sector to the next, and from one year to the next (Table 3).²¹

Apple, beef, and hog farms have had expense to income ratios of close to 100% or more in recent years, indicating that they have no margin or are losing money. Of the farm sectors studied, the dairy sector is closest to the viability threshold of 80%. This is no surprise as dairy farmers are well organized and have some control over supply and price.

For more accurate evaluation of these sectoral data, it would be useful to have a more complete set of results for all years and all sectors.

¹⁹ Cash receipt figures are from Statistics Canada, *Agriculture Economic Statistics*, catalogue 21-603-UPE, 'Farm Cash Receipts from Farming Operations' tables: June 2000 update ('96-'99), June '99 update ('83-'95), and June '97 update ('71-'82). Expense figures are from Statistics Canada, *Agriculture Economic Statistics*, catalogue 21-603-UPE, 'Farm Operating Expenses and Depreciation Charges' tables: June 2000 update ('96-'99), June '99 update ('83-'95), and June '97 update ('71-'82).

²⁰ The trend lines in this figure are shown in black.

²¹ Figures are compiled from NSDAM, Farm Management Analysis Project (Dairy Results, 1999, 1998 and 1997; Tree Fruit Results, 1995-1999; Beef Cow-Calf Results, 1997; Hog Farrow to Finish Results, 1997-1999), Business Management and Economics Section, Truro.

**Table 3: Average Expense to Income Ratio (%),
Surveyed Nova Scotia Farms, by Sector**

| Farm type | Number of farms sampled ²² | Year | Expense to income ratio (%) ²³ | Expense to income ratio (%) with direct payments and contributions excluded ²⁴ |
|------------------------|---------------------------------------|------|---|---|
| Dairy | Not given | 1999 | 81 | 86 |
| Dairy | 71 | 1998 | 83 | 86.5 |
| Dairy | 76 | 1997 | 77 | 81 |
| Apple | 10 | 1999 | 96 | 104 |
| Apple | 12 | 1998 | 100 | 102 |
| Apple | 14 | 1997 | 108 | 115 |
| Apple | 15 | 1996 | 108 | 110 |
| Apple | 14 | 1995 | 103 | 104 |
| Beef (cow/calf) | 11 | 1997 | 153 | 167 |
| Hog (farrow to finish) | 25 | 1999 | 95.5 | 114.4 |
| Hog (farrow to finish) | 26 | 1998 | 98 | 120 |
| Hog (farrow to finish) | 24 | 1997 | 95 | 95.5 |

Source: NSDAM, *Farm Management Analysis Project*

What do these expense ratio trends indicate? Simply put, farm gate food is increasingly under-priced. What producers are getting for their products barely covers what they are paying to produce it, making farming an increasingly risky enterprise in the province. Kings County farmers interviewed by GPI Atlantic in the course of this research frequently asked variants of the same question: ‘Does Nova Scotia want its own agriculture?’ They themselves are increasingly uncertain of the answer.

Why has the expense to income ratio risen over the last 28 years? The trend is due to a number of factors. The cost of feed, for instance, has risen because government freight assistance has been removed. Other agriculture assistance programs have also been removed during this time period.²⁵ The higher expense to income ratio is also due to the increasing cost of farm inputs like labour, machinery, fuel, and fertilizers as well as feed.

²² The number of farms sampled is small and therefore average figures presented here cannot be interpreted as representative of farms in the province as a whole.

²³ The ratio at the farm level is derived in exactly the same manner as provincial ratios, although data sources are different, and average figures for each farm sector in the province are not available. Given these data limitations, the averages presented in Table 3 should be understood as illustrative rather than statistically valid for the province as a whole.

²⁴ See glossary for definition of payments. Some payment programs require farmer contributions. These are also excluded from this scenario in order to determine what the expense to income ratio would be without subsidy programs. This last column is, therefore, a more strictly market-based assessment that allows an estimate of the impact of subsidy programs in reducing the expense to income ratio. As Table 3 indicates, subsidies and direct payment programs by government played a critical role in 1998 and 1999 in reducing losses among hog farmers.

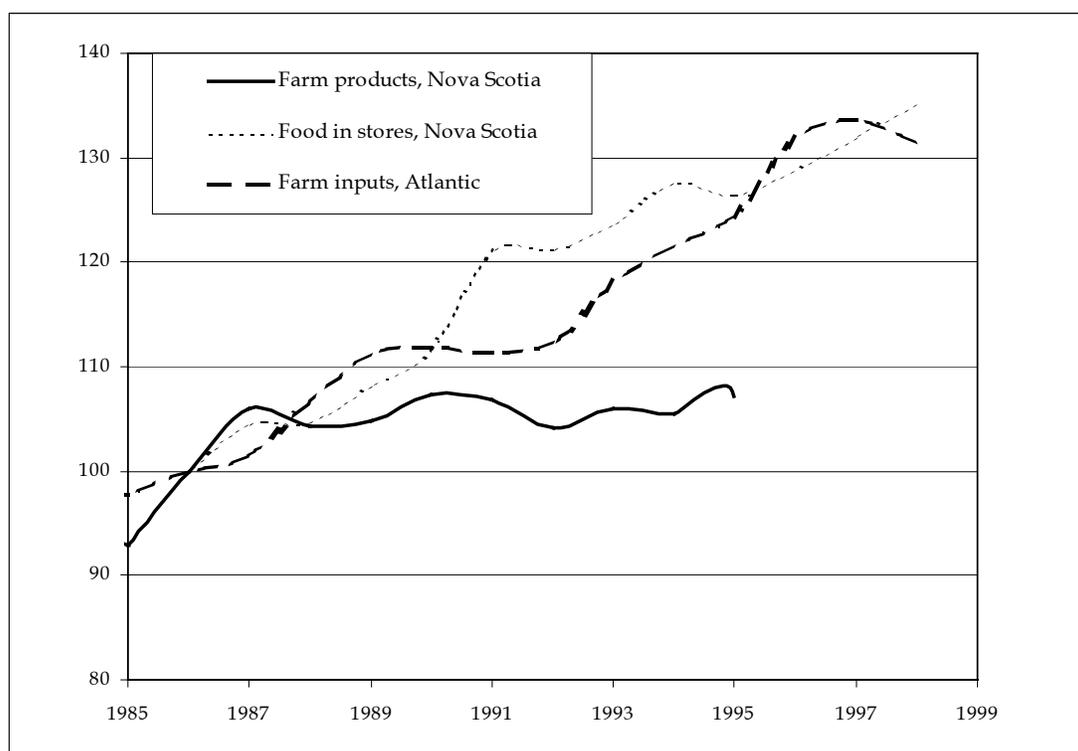
²⁵ See David Robinson’s comments in Appendix III. The author is grateful to Mr. Robinson for providing important details on changes in these government assistance programs, and on the impact of these changes on farm input prices.

On the income side of the equation, the farm gate price of food may also be in decline due in part to increasing concentration in the food retail sector (see Section 3 and Appendix III for more details).

Price indexes for farm products and farm inputs (Figures 5 and 6) show a sharp rise in the price of farm inputs since the mid-1980s in comparison to farm product prices which have remained stagnant. As well, increases in the price of food in stores have sharply outpaced farm gate prices, indicating that food sector profits are accruing to other sectors in the food system rather than to producers.

Unfortunately, Statistics Canada discontinued the compilation of the farm products price index after 1995, so that it is no longer possible to keep track of this vitally important indicator of farm sector viability. GPI Atlantic strongly recommends that the farm products price index be restored without delay. The ongoing comparison between farm input and farm product prices should be a key economic indicator of genuine progress in agriculture and requires this important database.

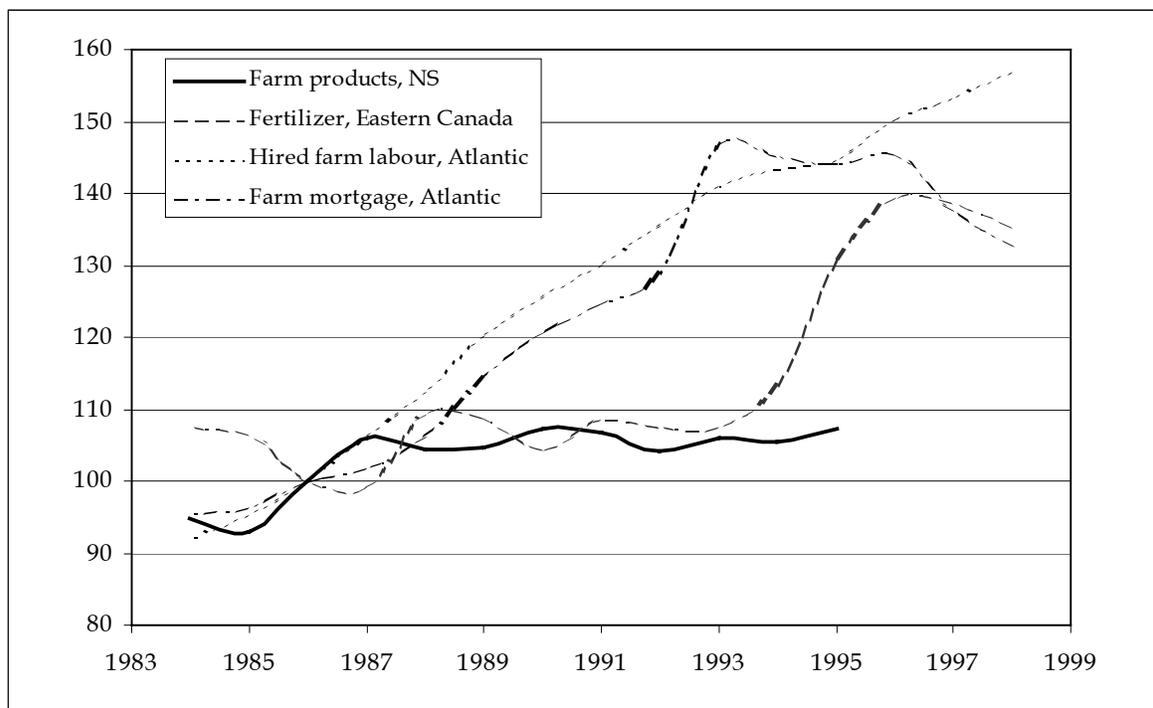
Figure 5. Price Indexes for Farm Products, Farm Inputs, and Food in Stores, 1985-1998 (1986 = 100)²⁶



Source: Statistics Canada, *Farm Product Price Index* and *Farm Input Price Index*.

²⁶ McLaughlin, B. and Robinson, D. *Nova Scotia Agricultural Statistics*, 1999; 1995; 1992. Nova Scotia Department of Agriculture and Marketing, Table 19. Their source is Statistics Canada, *Farm Product Price Index*, catalogue 62-003; and *Farm Input Price Index*, catalogue 62-004.

Figure 6. Price Indexes for Farm Products, and Selected Farm Inputs, 1985-1998²⁷
(1986 = 100)



Source: Statistics Canada, *Agriculture Economic Statistics*.

2.4 Return on Investment²⁸

Return on investment is a very basic and revealing indicator of farm economic viability. Farmers invest heavily in their farm businesses, but rarely do they get the kinds of returns sought by mutual or pension fund investors -- despite the long hours of work necessary to run a farm.

Return on investment figures for farms surveyed in Nova Scotia by the Nova Scotia Agriculture Department's Farm Management Analysis Project²⁹ are derived in the following way:

$$\text{Return on investment (or equity) (\%)} = \frac{\text{net income} - \text{value of unpaid labor}}{\text{total assets} - \text{total liabilities}} \times 100$$

²⁷ McLaughlin, B. and Robinson, D. *Nova Scotia Agricultural Statistics*, 1999; 1995; 1992. Nova Scotia Department of Agriculture and Marketing, Tables 19. Their source is Statistics Canada, *Farm Product Price Index*, catalogue 62-003; and *Farm Input Price Index*, catalogue 62-004.

²⁸ See Appendix III for reviewer comments on this section

²⁹ *Farm Management Analysis Project*, Nova Scotia Department of Agriculture and Marketing, Business Management and Economics Section. For example, see p. 3, Dairy Results: 1998.

Return on investment figures for surveyed farms in Nova Scotia show that only dairy farmers are making a reliable return on investment, while apple and beef farmers have no return at all and are losing money (Table 4).³⁰ If return on investment is below other investment opportunities (such as guaranteed investment certificates, mutual funds, pension funds, or other businesses) then in the long term, people will be unwilling to invest in unprofitable farming operations -- particularly where a large investment of several hundred thousand dollars is required. This has already been identified by the Nova Scotia Federation of Agriculture as a serious problem.

Table 4: Average Return on Investment (%), Surveyed Farms, by Sector

| Farm type | Number of farms sampled | Year | Return on investment (%) |
|------------------------|-------------------------|------|--------------------------|
| Dairy | Not available | 1999 | 11.2 |
| Dairy | 71 | 1998 | 9.0 |
| Dairy | 76 | 1997 | 9.0 |
| Apple | 10 | 1999 | Less than zero |
| Apple | 12 | 1998 | Less than zero |
| Apple | 14 | 1997 | Less than zero |
| Apple | 15 | 1996 | Less than zero |
| Apple | Not available | 1995 | Less than zero |
| Beef (cow/calf) | 11 | 1997 | Less than zero |
| Hog (farrow to finish) | 25 | 1999 | 4.9 |
| Hog (farrow to finish) | 26 | 1998 | Less than zero |
| Hog (farrow to finish) | 24 | 1997 | 9.7 |

Source: NSDAM, *Farm Management Analysis Project*

For comparison, trustee pension funds brought in an average return on investment of 10.2% for the period between 1995 and 1999.³¹ We have therefore set the viability threshold at 'more than 5%' (recognizing that even that is quite low, and therefore represents a lower bound estimate). Ideally, returns would be about 10% to make farming competitive with other investment options.

Considering that farming returns are frequently less than 5% and are in many cases negative, it is worth considering whether any other industry would survive in similar circumstances. Such inter-industry comparisons are necessary in order to take seriously the economic threats to the long-term survival of family farming and agriculture in Nova Scotia.

2.5 Total Debt to Net Farm Income Ratio³²

³⁰ Figures are compiled from NSDAM, *Farm Management Analysis Project* (Dairy Results, 1999, 1998 and 1997; Tree Fruit Results, 1995-1999; Beef Cow-Calf Results, 1997; Hog Farrow to Finish Results, 1997-1999), Business Management and Economics Section, Truro.

³¹ Statistics Canada, *Trusteed Pension Funds*, catalogue 74-201-XPB, 2000, p.17.

³² See Appendix III for reviewer comments on this section

The debt to net farm income ratio is an indicator of the risk adopted by the farming sector relative to the net income it generates. Conventional analysis uses debt to equity ratios or interest as a percentage of revenue as indicators of *ability to make payments* on the debt.³³ These are valuable indicators.

However, if we are to determine the long-term viability of farming, it is even more informative to look at total farm debt over time relative to total net income. If debt is going up relative to net income, this signals not only a declining capacity to make payments on debt, but may also indicate long-term industry trends of significance to policy makers: Either the industry is not robust, or it may be overcapitalized, or it may be suffering from income-depressing prices that are not keeping pace with farm input costs. In many cases, a combination of all three factors may be responsible for raising the debt to net income ratio.

The total debt to net farm income ratio is derived using the following formula:

$$\text{Total debt to net farm income ratio (\%)} = \frac{\text{total farm debt}}{\text{total net income}} \times 100$$

In a healthy farming sector, the ratio of debt to net income is here estimated to average 600% or less. In other words, total outstanding farm loans would not exceed six times total net farm income over time. The 600% threshold is based on the fact that in 16 years out of the last 28, Nova Scotia farmers have achieved this threshold as a sector average.

In the long run, an ascending ratio over time indicates that farmers have to accept higher risks (and go deeper into debt) in order to achieve the same amount of net income. The risk-prone nature of farming also dictates that total debt not be too high relative to income, as unpredicted fluctuations due to weather, pests, diseases, trade decisions, and sudden commodity price changes may imperil farmers' ability to make payments.

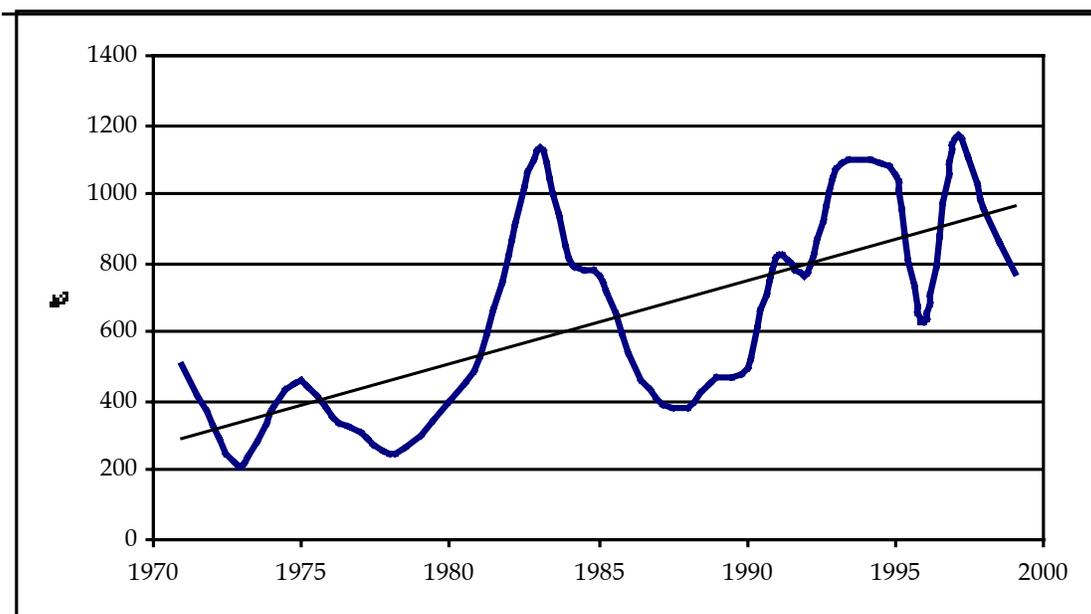
High overall debt levels may also have ecological and safety consequences and imperil responsible land stewardship, if farmers cut corners in order to make the payments. These issues will be examined further in subsequent reports.

Figure 7 shows that total farm debt in Nova Scotia is currently more than 900% of total net farm income³⁴. ***The debt to net income ratio has increased three-fold in the last 28 years, with total debt rising from an average of 300% of net income in the early 1970s to more than 900% by the end of the 1990s.***

³³ *Farm Management Analysis Project*, Nova Scotia Department of Agriculture and Marketing, Business Management and Economics Section. For example, see p. 3, Dairy Results: 1998.

³⁴ Debt figures are from Statistics Canada, *Agriculture Economic Statistics*, catalogue 21-603-UPE, 'Farm Debt Outstanding' tables: June 2000 update ('95-'99), June '99 update ('83-'94), and June '94 update ('71-'82). Net farm income figures are from Statistics Canada, *Agriculture Economic Statistics*, catalogue 21-603-UPE, 'Net Farm Income' tables: June 2000 update ('95-'99), June '99 update ('83-'94), and June '97 update ('71-'82).

Figure 7: Percentage of Total Farm Debt to Net Farm Income, Nova Scotia Farms (1971-1999)³⁵



Source: Statistics Canada, *Agriculture Economic Statistics*.

It should be noted that the 600% ‘sustainability threshold’ for the debt to income ratio is an estimate for the provincial farming sector as a whole. At the individual farm level, however, this sustainability threshold will vary according to the security of farm income. Supply-managed dairy or poultry farms, because of their steadier and more secure incomes, would likely be able to weather relatively high debt levels, unless interest rates increased significantly. Fruit producers, on the other hand, are potentially at risk of default at considerably lower levels of debt, because their incomes are more marginal and tend to fluctuate unpredictably with changing weather, market, and price conditions.

Table 5 indicates the significant disparities that exist among different farm sectors. For surveyed farms, the dairy sector had an average debt to income ratio about 25% higher than the viability threshold of 600%, while the latest survey of hog farms indicates a debt to income ratio nearly three times higher than the estimated viability threshold.³⁶

Table 5: Average Debt to Net Income Ratio (%), Surveyed Farms, by Sector

| Farm type | Number of farms sampled | Year | Debt to net income ratio(%) |
|-----------|-------------------------|------|-----------------------------|
|-----------|-------------------------|------|-----------------------------|

³⁵ The trend line in this figure is shown in black

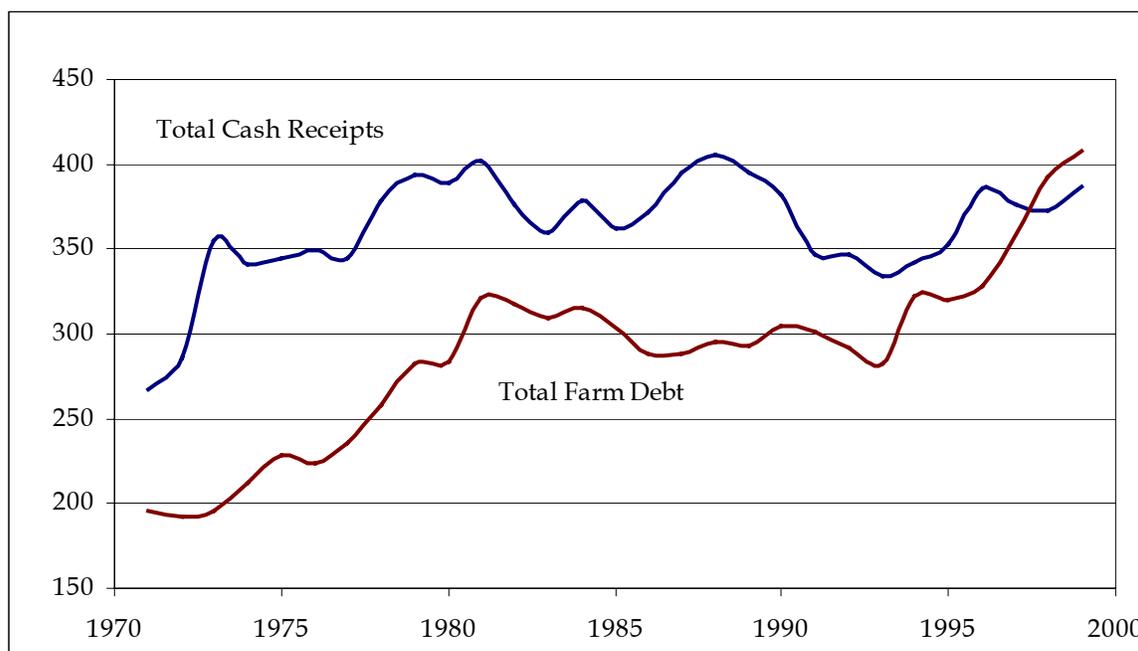
³⁶ Figures are compiled from NSDAM, *Farm Management Analysis Project* (Dairy Results, 1999, 1998 and 1997; Hog Farrow to Finish Results, 1997-1999), Business Management and Economics Section, Truro.

| | | | |
|------------------------|-----------|------|------|
| Dairy | Not given | 1999 | 773 |
| Dairy | 71 | 1998 | 750 |
| Dairy | 76 | 1997 | 755 |
| Hog (farrow to finish) | 25 | 1999 | 1739 |
| Hog (farrow to finish) | 26 | 1998 | 4325 |
| Hog (farrow to finish) | 24 | 1997 | 1376 |

Source: NSDAM, *Farm Management Analysis Project*

Using the more conventional measures to examine levels of gross income and total debt separately, we find that the picture is no more encouraging. For the first time, average provincial farm debt levels in the late 1990's actually exceeded gross farm receipts (Figure 8).

Figure 8: Total Farm Cash Receipts and Total Farm Debt, Nova Scotia Farms, 1971-1999 (\$1997 millions)³⁷

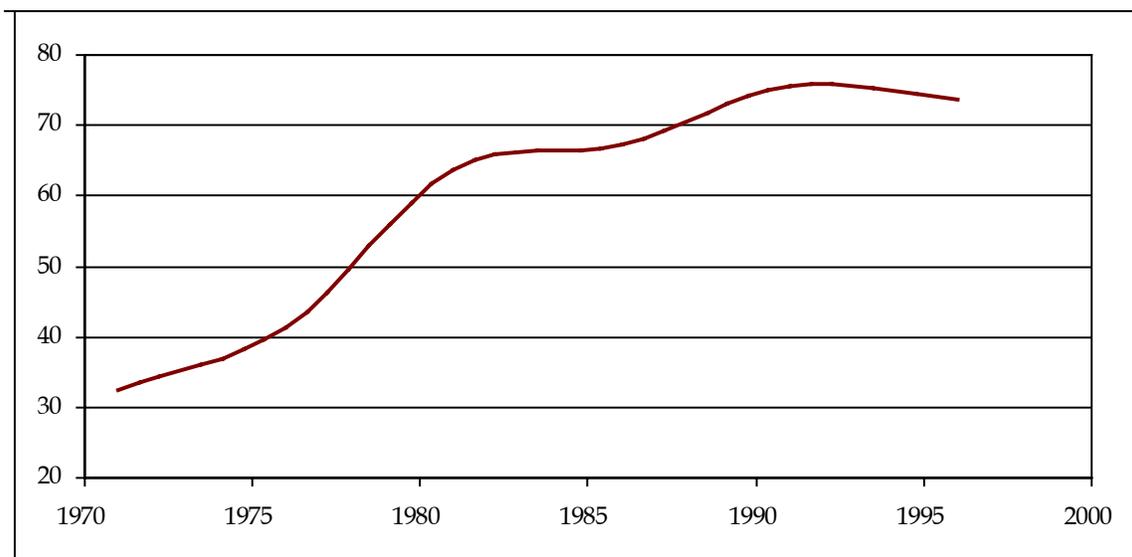


Source: Statistics Canada, *Agriculture Economic Statistics*.

In absolute figures, total debt (loans outstanding) per census farm in Nova Scotia has more than doubled in just 25 years (Figure 9).

³⁷ Cash receipt figures are from Statistics Canada, *Agriculture Economic Statistics*, catalogue 21-603-UPE, 'Farm Cash Receipts from Farming Operations' tables: June 2000 update ('96-'99), June '99 update ('83-'95), and June '97 update ('71-'82). Debt figures are from Statistics Canada, *Agriculture Economic Statistics*, catalogue 21-603-UPE, 'Farm Debt Outstanding' tables: June 2000 update ('95-'99), June '99 update ('83-'94), and June '94 update ('71-'82).

Figure 9: Farm Debt Outstanding Per Census Farm³⁸, Nova Scotia, 1971-1996,
(Total outstanding farm debt divided by number of census farms, \$1997 thousands)³⁹



Source: Statistics Canada, *Agriculture Economic Statistics*.

2.6 Direct Government Payments to Producers: The Dependency Ratio⁴⁰

If market mechanisms worked perfectly, farmers would be paid enough for the food they produce so that farm subsidies and other direct government payments to farmers would not be necessary. In this ideal market world, farmers would adjust prices according to production costs. However, lack of market power has prevented farmers from raising prices in response to farm input cost increases. Figures 5 and 6 above demonstrated that the price index for farm products has remained stagnant relative to both farm input costs and store food prices.

In this situation, direct government payments to farmers allow those who buy food from farmers (wholesalers, packers, processors, retailers etc.) to do so at artificially low prices. From this perspective, direct government payments to farmers can actually be considered as hidden subsidies to processors, wholesalers, and retailers, and also to those who sell inputs to farmers. That caveat is important in assessing trends in direct government payments to producers, so that these payments are not considered artificial supports for farmers alone but rather compensations for more far-reaching market distortions.

³⁸ Because the number of farms in Nova Scotia is only counted once every five years, the trend line for inter-censal years in this chart can only be estimated. The last census was in 1996.

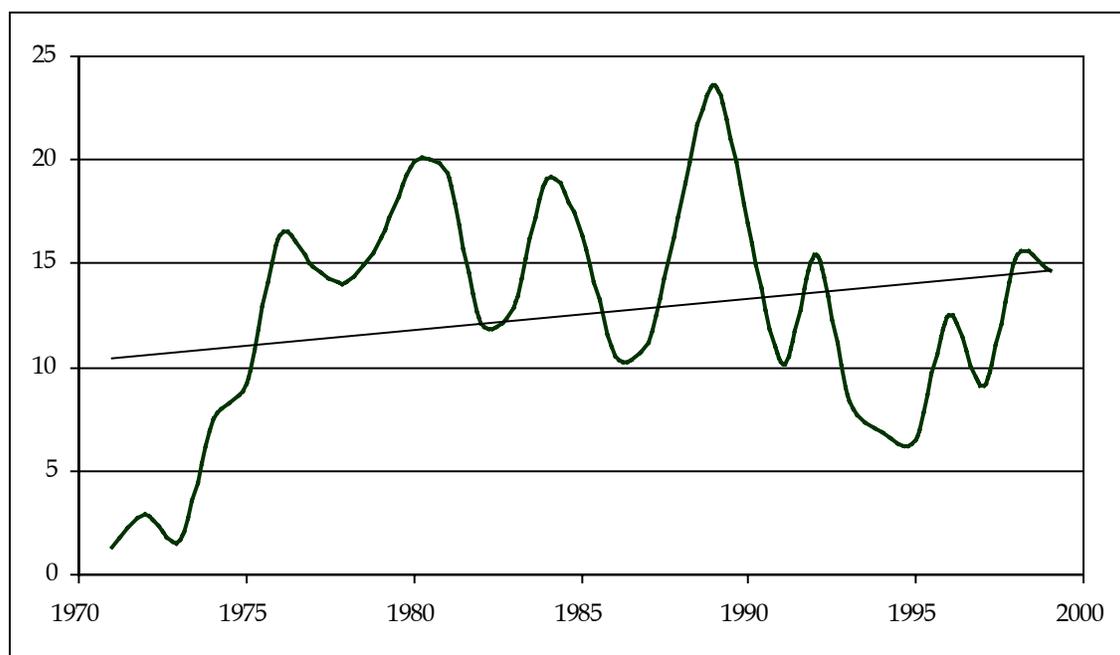
³⁹ Debt figures are from Statistics Canada, *Agriculture Economic Statistics*, catalogue 21-603-UPE, 'Farm Debt Outstanding' tables: June 2000 update ('95-'99), June '99 update ('83-'94), and June '94 update ('71-'82). 'Number of Census farms' is from Statistics Canada, *Historical Overview of Canadian Agriculture*, 1997, catalogue 93-358-XPB.

⁴⁰ See Appendix III for reviewer comments on this section.

The dependency ratio indicator is different from the previous four indicators. It deals with a more profound level of viability, namely self-reliance, economic independence, and market efficiency. Viability declines when any of these factors is undermined.

Figure 10 shows that total direct payments to producers⁴¹, averaged out over the last 28 years, have increased by nearly 50%, from an average of about \$10.5 million to nearly \$15 million after correcting for inflation (see the trend line). However, the fluctuations over time also indicate that these direct payments fell during the 1990s at the same time that other indicators of farm viability showed declining trends. Since 1971, total net farm income *before* government payments has declined by nearly 60% from an average of about \$60 million to \$25 million in constant 1997 dollars (Figure 13).

Figure 10: Direct Payments to Producers, Nova Scotia Farms (1971-1999)⁴²
(\$1997 millions)



Source: Statistics Canada, *Agriculture Economic Statistics*.

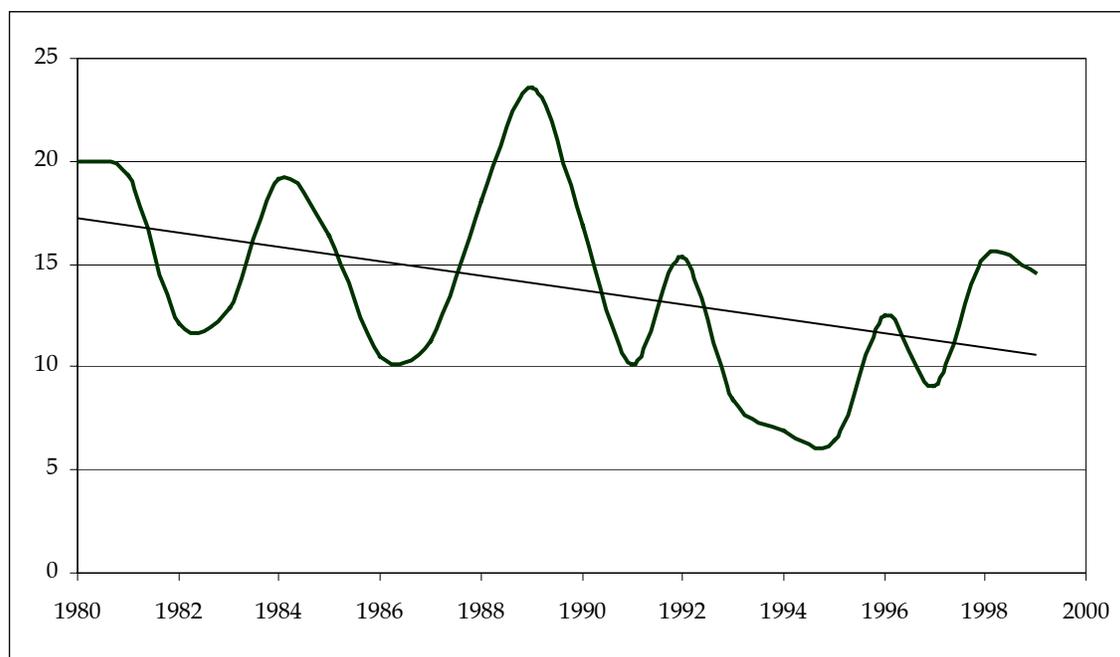
In this particular case, however, the trend line in Figure 10 is deceptive and does not accurately portray recent trends. The last 20 years have in fact seen a 35% decline in direct payments to producers from an average of \$17 million in the early 1980s to \$11 million in the late 1990s (in constant 1997 dollars, Figure 11.)^{43, 44}

⁴¹ 'Payments' data are from Statistics Canada, *Agriculture Economic Statistics*, catalogue 21-603-UPE, 'Direct Payments to Producers' tables: June 2000 update ('96-'98), June '99 update ('95), June '97 update ('84-'94), and June '94 update ('71-'83).

⁴² The trend line in this figure is shown as a straight thin black line.

⁴³ For further details on the declines in government payments to producers, see David Robinson's comments in Appendix III.

Figure 11: Direct Payments to Producers, Nova Scotia Farms (1980-1999)⁴⁵
(\$1997 millions)



Source: Statistics Canada, *Agriculture Economic Statistics*.

The figures above refer only to direct payments to producers. If we consider *all* federal and provincial government expenditures in support of agriculture in Nova Scotia (from all departments including Agriculture and Agri-Food Canada, NS Department of Agriculture and Fisheries, and federal and provincial health, transportation, rural development and finance departments), it is clear that government support of agriculture eroded substantially during the 1990s.⁴⁶ In less than a decade, government spending in support of agriculture was cut in half (Figure 12).

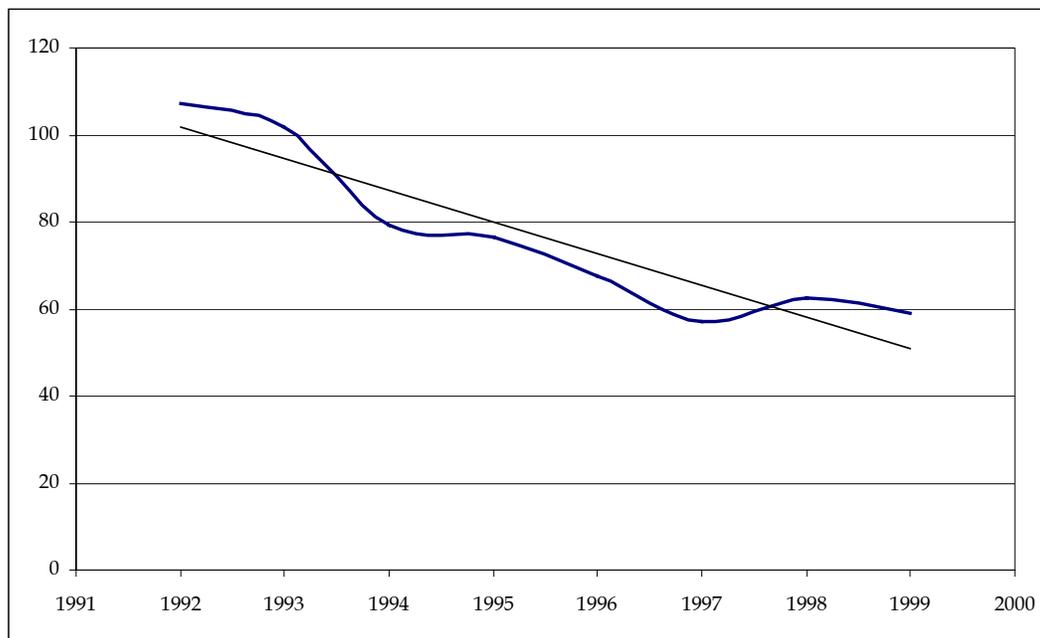
Figure 12: Total Federal and Provincial Government Expenditures in Support of Agriculture in Nova Scotia, 1992-1999 (millions of \$1997)⁴⁷

⁴⁴ 'Payments' data are from Statistics Canada, *Agriculture Economic Statistics*, catalogue 21-603-UPE, 'Direct Payments to Producers' tables: June 2000 update ('96-'98), June '99 update ('95), June '97 update ('84-'94), and June '94 update ('71-'83).

⁴⁵ The trend line in this figure is shown as a straight thin black line.

⁴⁶ Agriculture and Agri-Food Canada, 1996 to 2001. *Farm Income, Financial Conditions and Government Assistance Data Book*. Available at www.agr.ca/policy/epad/english/pubs/dbook/2001/01/index_e.htm.

⁴⁷ The trend line is shown on the chart as a straight, narrow line.



Source: Agriculture and Agri-Food Canada, *Data Book*.

In addition, government expenditures in support of agriculture in Canada are also very low relative to other OECD countries, and are declining as a percentage of agricultural output, as demonstrated in Table 6. The decline in government support for agriculture in the last decade has also been sharper in Canada than in other OECD countries.

Table 6: Total Support Estimate⁴⁸ (% of GDP) for Agriculture in Selected Countries

| Country | 1997-99 | 1986-88 |
|---------------------------|-------------------|---------|
| Canada | 0.9 ⁴⁹ | 1.9 |
| US | 1.1 | 1.7 |
| EU | 1.8 | 2.4 |
| Average of OECD countries | 1.7 | 2.3 |

Source: OECD. *Agricultural Policies in OECD Countries*.

The relationship between net farm income and direct government payments to producers is a variant of the ‘dependency ratio’ developed by Statistics Canada for low-income

⁴⁸ Total support estimate (TSE) is an indicator of the annual monetary value of all gross transfers from taxpayers and consumers arising from policy measures that support agriculture, net of the associated budgetary receipts, regardless of their objectives and impacts on farm production and income, or consumption of farm products. When expressed as a percentage of the GDP (the % TSE), it gives an indication of the amount this overall support represents for the economy.

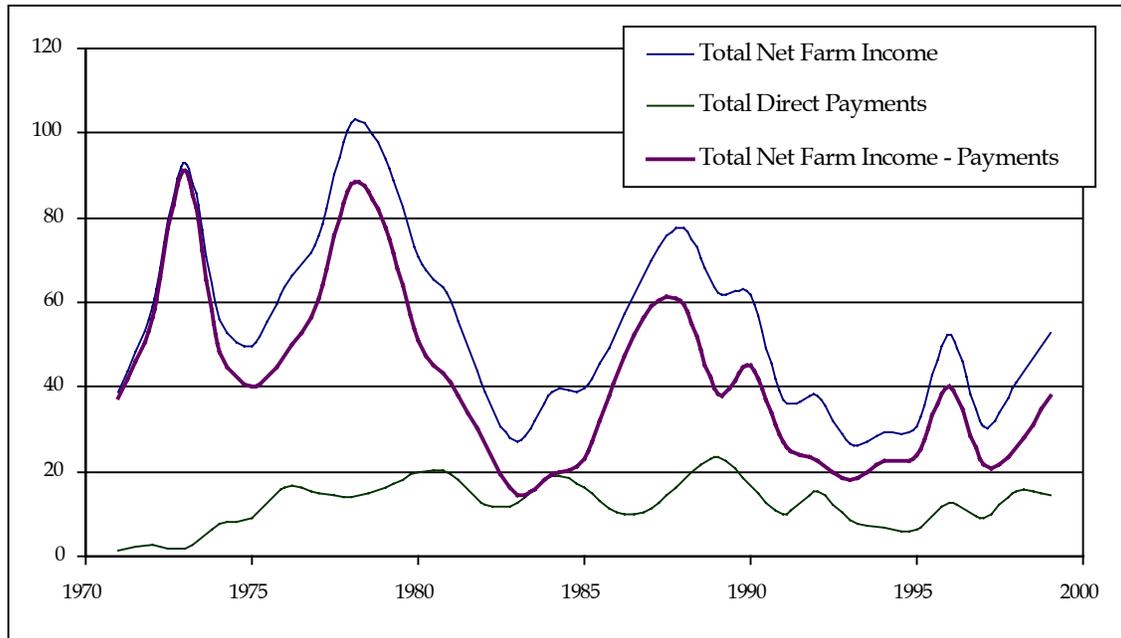
⁴⁹ Figures are from a graph in: OECD, 2000. *Agricultural Policies in OECD Countries. Monitoring and Evaluation 2000*. Paris: OECD Publication Service, p.20.

earners dependent on 'transfer payments'⁵⁰. The 'dependency ratio' for Nova Scotia farms is derived by dividing total direct payments to farmers by total net farm income⁵¹ in the following formula:

$$\text{Dependency Ratio} = \frac{\text{Total Direct Payments}}{\text{Total Net Income}} \times 100$$

Given that the net income trend is sharply downward while the payments trend is upward since 1971, down since the 1980s, and relatively stable during the 1990s (Figure 13), the dependency ratio has gone up dramatically, more than doubling in the last 28 years (Figure 14).

Figure 13: Total Net Farm Income Minus Direct Payments, Nova Scotia Farms (1971-1999)⁵² (\$1997 millions)



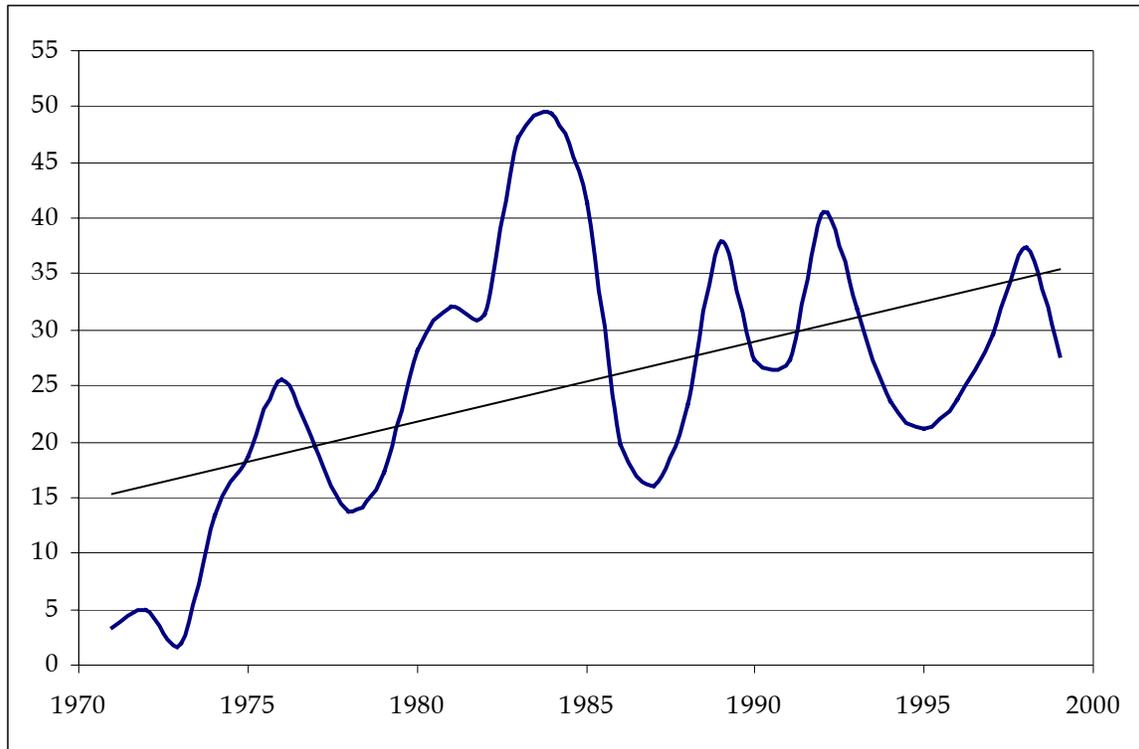
Source: Statistics Canada, *Agriculture Economic Statistics*.

⁵⁰ Statistics Canada, "Economic dependency profiles" *The Daily*, July 27, 1999.

⁵¹ 'Net farm income figures are from Statistics Canada, *Agriculture Economic Statistics*, catalogue 21-603-UPE, 'Net Farm Income' tables: June 2000 update ('95-'99), June '99 update ('83-'94), and June '97 update ('71-'82). See note 34 for payments sources.

⁵² Net farm income figures are from Statistics Canada, *Agriculture Economic Statistics*, catalogue 21-603-UPE, 'Net Farm Income' tables: June 2000 update ('95-'99), June '99 update ('83-'94), and June '97 update ('71-'82). See note 34 for payments sources.

Figure 14. Dependency Ratio (%), Nova Scotia Farms, 1971-1999⁵³



Source: Statistics Canada, *Agriculture Economic Statistics*.

This trend indicates that over time, farms are becoming increasingly dependent on government payments for income, which, in turn, indicates increased farm vulnerability, and the declining economic viability of the agricultural sector in Nova Scotia. In these circumstances, with a steadily declining capacity to rely on market income, any withdrawal of government services, as occurred in the 2000 Nova Scotia budget, hits farmers harder than ever.

It is important to emphasize that direct government payments are desirable *neither* for the farmer, whose self-reliance depends on fair market prices, *nor* for the taxpayer, who ultimately bears the cost of market failure. A ratio, by definition, can change even if only one component of the equation shifts. In this case, the increasing dependency ratio can be attributed almost entirely to decline in net farm income (see section 2.2 and Figure 13). The data clearly demonstrate that farmers are losing self-reliance and independence because of declining net farm income.

The inability of market mechanisms to compensate farmers adequately for their products, and the consequent increasing reliance on government payments, indicates a market failure that must be closely examined if this trend is to be reversed. Strictly speaking, the

⁵³ The trend line in this figure is shown as a straight thin black line.

dependency ratio is less an indicator of the capacity of farming to survive economically than of farm vulnerability and loss of self-reliance and independence. Theoretically, farm survival *could* be ensured through ever larger government payments. In the long run, however, such market failures and loss of farm independence, and their consequent burden on taxpayers, do not signal a healthy and robust agriculture sector. A better solution is clearly to ensure that farm products fetch adequate prices at the farm gate.

There is no agreed sustainability threshold for this dependency ratio on farms. Based on historical trends, GPI Atlantic estimates that direct government payments to farmers should not exceed 20% of net income, *provided that* market mechanisms adequately support a viable farm sector. At an average dependency ratio of 35%, the Nova Scotia farm sector is well above the sustainability threshold, and farm economic independence has been significantly undermined.

Although a rising dependency ratio indicates declining farm viability, it would be a serious policy error to force the dependency ratio down artificially by cutting payments to farmers. Payments to farmers are essential so long as farmgate prices remain artificially low. The mistake is in seeing these payments as subsidies to *farmers*, when farmers are in fact subsidizing low farm product prices.

There is an analogy here with other GPI reports. For example, GPI Atlantic's *Cost of Crime in Nova Scotia* counts the costs of prisons, police and security systems as "costs" to the economy, rather than as economic gain (as in the GDP). That accounting system does *not* imply that these costs can be artificially forced down during a time of high crime rates by cutting spending on prisons, police and security. The better (and longer-term) solution is clearly to lower crime rates through preventive action, and through addressing the deeper social and economic determinants of crime. That, in turn, will reduce costs.

Similarly, the solution to the rising dependency ratio is not to cut direct payments to farmers, but to address the deeper underlying causes of the market failure that has allowed farmgate prices to stagnate while farm input and store food price costs have climbed sharply. As noted above, *both* sides of the dependency (or any other) ratio must be closely examined. Since the increase in the dependency ratio is the direct result of declining net farm market income, that is the arena where long-term solutions must be sought if farm viability and economic capacity is to be strengthened.

3. Kings County Preliminary Survey

The preceding statistical analysis paints a rather grim picture of farm economic viability in Nova Scotia, with every indicator signaling a declining trend. It is highly likely that the picture is replicated throughout the country. It remains, nonetheless, a statistical portrait that obscures the human face of farming and the impact of these trends on farm families.

GPI Atlantic is currently working with community groups in Kings County to construct a Genuine Progress Index there as a measure of wellbeing and sustainable development at the community level. Because Kings County is also the agricultural heart of Nova Scotia, an opportunity exists to supplement the GPI statistical analysis with a more human portrait of farm sector health.

In 1999-2000, GPI Atlantic, in partnership with the Nova Scotia Citizens for Community Development Society, worked with farmers and community groups in Kings County to construct a detailed questionnaire both on farm economic viability and on the broader ecological and social issues involved in ensuring genuine progress towards more sustainable agriculture. That questionnaire was field-tested in the spring of 2000, and farmers subsequently gathered to assess the results and recommend revisions in the questionnaire.

While no claims to statistical validity are made for the results of this preliminary field-test, and while far more extensive surveying from a larger farm sample is now necessary, we have decided to include here, for illustrative purposes, farmer responses that are directly relevant to the issue of farm economic viability. Despite this major caveat, the responses are extraordinarily revealing, and they uncover a human reality and insight that the statistics in the previous chapter alone are unable to accomplish.

Eight Kings County farmers were chosen for the preliminary survey to assess their thoughts about genuine progress in agriculture. The interview process required a serious commitment on the part of the interviewers and of the farmers being interviewed. Each interview took from two to four hours of focused attention.

The sample of farmers was carefully chosen to include a number of different farm types that exist within the county (Table 7). The last census in 1996 indicates that there are 707 farms in Kings County. Our field-test sample is not at all representative as it includes just over 1% of County farms. Every effort was made, however, to include in the field test both small and large farms; diversified and specialty farms; conventional and organic farms; and to speak with both men and women.

A small portion of the results from those interviews, pertaining to farm economic viability, are presented here along with other relevant material to present the human face of the statistics outlined in the previous chapter. The growers will remain anonymous. Additional materials presented in this chapter include specific Kings County data from

the *Nova Scotia Agriculture Statistics* that are relevant to the Kings County Community GPI.

Table 7: Profile of Interviewed Farmers

| Farm | Years of experience | Size of farm (acres) | Items sold from farm | Farm category | % of farms in County with similar category (1996) |
|------|---------------------|----------------------|--|-----------------|---|
| A | 47 | 400 | hay, apples, some pulp wood (presently stopped farming) | fruit | 20 |
| B | 28 | 28 | garlic (organic) | vegetable | 9 |
| C | 42 | 800 | carrots, onions, peas, chicken and turkey broilers, grain | poultry | 11 |
| D | 30 | 40 | apples | fruit | 20 |
| E | 6 | 50 | breeding stock: sheep, cattle, pigs, and chickens (partly organic) | misc. specialty | 14 |
| F | 38 | 309 | milk, beef, grain | dairy | 8 |
| G | 30 | 250 | grain, pork, beef | hog | 7 |
| H | 12 | 175 | beef, vegetables, berries, grain & hay (certified organic) | beef | 18 |

3.1 Highlights from the Discussion

Discussion about farm economic viability occurred throughout the lengthy interview process, even when questions were not specifically about economics. The continued surfacing of this issue in every conceivable context confirms our opening remarks that farm economic viability is the “bottom line” on which responsible land and soil stewardship and overall sustainability depend.

Results of discussions about income, risk, and the price of food are presented in specific sections below. This section indicates how economic viability issues directly impact farm quality of life in general. Farmer responses directly relevant to the specific trends highlighted in the previous chapter are italicized.

Question: *Can you give examples of things that improve (or would improve) your quality of life on the farm?*

Four of the eight farmers responded *that it would be important to get a fair return or value for their products*. Two of those also mentioned that it was important *to get a better return on investment*. One grower explained that when “margins are very small, there’s less money for the investment. You have to mesh everything together and gain small efficiencies in order to compete. We employ fewer people as a result.”

Question: *In your opinion, what are the most important values associated with farming that are generally not counted or recognized by society?*

Responses:

“Society doesn’t recognize the work, risk, and costs to the farmer. It’s the middleman that gets the raise.”

“Farmers are feeding society without being financially compensated for the work that goes into it. This work is not recognized by society.”

“There is not enough knowledge in society about the cost, investment, and risk involved with farming. Maybe if the trucker’s strike [at the NB/NS border] had gone on for a few more days, consumers would become more aware of the importance of local farms.”

Question: *What are your motivations for farming? What are the positive aspects of farming for you?*

The motivations and *positive* aspects of farming were grounded in the excitement and challenge of making the operation work successfully, or in one case of making the farm a self-sustaining ecosystem. Connection with animals and the outdoors were also strong motivations. Here is one farmer’s comment that reveals an important understanding of the direct consequences of actions: “When you live on the land, you know that if one insect gets out of hand because you changed its habitat, this can throw the whole balance off. Farmers get a sense of balance and can see the impact more quickly.”

Comments on the *negative* aspects of farming included:

- “thankless and unforgiving at times”;
- “there’s no stability”;
- “no fair value for produce”;
- “infrastructure costs are high”;
- “takes too much time away from family”;
- “weather unpredictable”;
- “my back hurts”;
- “more sedentary than before because of technology”;
- “physically dangerous because of the machinery and chemicals”;
- “no matter how hard you work, you don’t get the returns”.

Another farmer made the very specific comment that he wished he’d bred his cows for longevity rather than for high milk production.

3.2 Farm Income

Question: *Would you like to comment on the level of income you get from farming? Is it enough for the work and investment you put in?*

Most interviewed farmers indicated that the level of income they are getting is not enough for the work and investment they are putting in (see Table 8). Comments such as “no fair value for the work you put in” or “no fair value for the product” were common.

One grower commented that on the one hand, the chain stores and national and global competition have beaten producers down to the lowest price possible. On the other hand, National Income Stabilization programs have made a positive difference. Another farmer emphasized that although farmers’ gross income had increased over time, relative expense levels are higher, which leaves them with a net decrease in income.

The only two growers who said they are compensated adequately for their work and investment are both organic growers who market all or most of their products directly to the people who eat them.

Table 8: Satisfaction With Farm Income, Surveyed Farms

| Type of farm | Adequate income for work and investment? | Does income fluctuate over time? |
|---|--|---|
| Apples, no longer farming | No | Constant until disability |
| Garlic, certified organic | Yes | Constant until disability |
| Poultry, Field vegetables | No | Fluctuates because of vegetable production and drought. Overall net decline. |
| Apples | No | There have been fluctuations in product price and yield, and overall, income has gone down over time. |
| Mixed specialty | No: “If we were in it for the money it wouldn’t be enough.” | It has fluctuated, but only because of decisions to change the farm |
| Dairy | Not fair value for the work you put in | Income is declining even though the quota provides a certain measure of stability. Although rotational grazing keeps costs down, overall, “it used to be easier.” |
| Pork, grain, beef | No, but stabilization programs help | Income has gone up and down. It fluctuates based on a three-year cycle. |
| Certified organic mixed beef, vegetables, berries, grain, hay | Yes. “I don’t expect to get rich, but I can set a price I’m comfortable with. I’ve been told I don’t charge enough.” | Fluctuates based on productivity rather than prices. |

Two farmers expressed frustration with the basic belief that if you work hard your returns will be good. Over the years this has proven not to be true for one of the fruit growers. With higher interest rates and other costs in the 80s, this farmer found himself deeper and deeper in debt. Over time, he was forced to sell a lot of his land to pay down his debt with the bank [selling the capital].

In other words, factors beyond this farmer's control have meant that no matter how hard he worked or how good the crop was, he didn't make enough money to continue. "The return isn't there," he says. Later he mentioned that his inheritance and money from off-farm jobs have also gone into the farm. This farmer's story illustrates that poor farm product prices can force a farmer to use up farm capital and subsidize the growing of farm products with off-farm income.

Another farmer explained that farming is a tremendous investment with a low return. Usually businesses can expect 22% to 26% return on their investment. A farmer's return, he says, tends to be in the range of 4% to 5%. This would not be tolerated in other sectors, he remarks. This farmer noted that family farms are often caught in a no-win squeeze -- to advance they have to get bigger, but to get bigger requires an investment that plunges them more deeply into debt. The solution, he personally feels, seems to be for family farms to find a unique market niche.

Both the statistical analysis of different surveyed farm sectors outlined in the previous chapter, and the preliminary interviews with Kings County farmers suggest an interesting common hypothesis. ***The only source of stability and adequate income in farming today seems to come from either quota systems for poultry and dairy or farmers that market organically grown food direct to the consumer without wholesale or retail middlemen.***

Certainly this preliminary conclusion merits further study. If further investigation proves this hypothesis correct, it has very important policy implications and suggests policy actions that can make farming considerably more viable and sustainable in the long term.

3.3 Risk

Other indicators of farm viability in Kings County include measures of debt per farm, and income as a proportion of capital value. Net income and debt figures were not available on a county level in published reports. Therefore, gross income and capital values are used in this section, although they are not ideal figures for assessing risk. For this reason, the figures presented here are not comparable with results in the previous chapter.

Higher levels of debt and capital infrastructure may allow a farmer to expand and to reduce per unit costs when farm product prices are good (as for example with supply managed commodities). However, high levels of debt and income/capital value may also increase risk when prices or other conditions take a downturn.

Tables 9 and 10 show that farm receipts in Kings County have increased *relative to* capital value per farm, and that this ratio is much more favourable in Kings County than in other more capital-intensive agricultural regions like Prince Edward Island. That is, it takes less capital investment to get the same amount of gross income in Kings County than it does in PEI, and less in 1995 than in 1980.

This may turn out to be a positive trend that holds promise for the future. However, caution must be exercised in the interpretation, *both* because net income figures (not currently available for Kings County) would provide a more accurate indicator of actual risk, *and* because the favourable ratio results from a decline in total farm capital rather than from an increase in total farm receipts.

Table 9: Capital Value on Farms, Kings County

| Year | Census farms | Total capital value (=value of land and buildings, machinery and equipment, livestock and poultry) (\$1997) | Capital value per farm (\$1997) |
|------|--------------|---|---------------------------------|
| 1996 | 707 | 313,368,115 | 443,236 |
| 1991 | 666 | 298,846,032 | 448,717 |
| 1986 | 711 | 323,246,700 | 454,636 |
| 1981 | 792 | 388,153,350 | 490,092 |

Source: *Nova Scotia Agricultural Statistics; Census of Agriculture*.⁵⁴

Table 10: Kings County Farms Gross Farm Receipts to Capital Value Ratio

| Year | Total gross farm receipts (\$1997) | Total farm capital (=value of land and buildings, machinery and equipment, livestock and poultry) (\$1997) | Farm receipts as a proportion of capital value (%) | Ratio: Prince Co. PEI | Ratio: Queens Co. PEI |
|------|------------------------------------|--|--|-----------------------|-----------------------|
| 1995 | 137,746,960 | 313,368,115 | 44% | 24% | 24% |
| 1990 | 143,982,162 | 298,846,032 | 48% | | |
| 1985 | 137,851,000 | 323,246,700 | 43% | | |
| 1980 | 140,795,820 | 388,153,350 | 36% | | |

Source: *Nova Scotia Agricultural Statistics; Census of Agriculture*.⁵⁵

⁵⁴ McLaughlin, B. and Robinson, D. 1992. *Nova Scotia Agricultural Statistics 1991*; Statistics Canada. 1997. *Agricultural Profile of the Atlantic Provinces, 1996*. Cat. No. 95-175; Statistics Canada 1982. *Nova Scotia Census of Agriculture, 1981*. Catalogue No. 96-904.

⁵⁵ McLaughlin, B. and Robinson, D. 1992. *Nova Scotia Agricultural Statistics 1991*; Statistics Canada. 1997. *Agricultural Profile of the Atlantic Provinces, 1996*. Cat. No. 95-175; Statistics Canada 1982. *Nova Scotia Census of Agriculture, 1981*. Catalogue No. 96-904.

Table 10 indicates that the ratio of gross farm receipts to total farm capital peaked in 1990 at 48% and subsequently declined to 44% in 1995. Nevertheless, Table 10 appears to indicate that Kings County farmers are in a considerably more resilient position than the heavily capitalized potato farms of Prince and Queen's County, PEI⁵⁶.

It keeps coming back to economics and big loans and banks on your back. We all want to be bigger and own more. I know some of the back to the earth types say we should just stay small and produce as much as you need. But you get caught up. You take out a loan to buy something. Then you have to get more pigs to pay off your loan. Before you know it, you are caught. It is the same for everyone. Everyone is in debt.

Kings County poultry and pork farmer⁵⁷

3.4 Price of Food

The price paid to farmers for the food they grow is an important part of the equation for farm economic viability. Food product prices will naturally fluctuate according to supply and demand, and according to how much power farmers have in the market place. In section 2.3 of this report, the difference between farm income and expenses was examined. The available data in that chapter suggested that the widening gap between income and expenses may be partly due to stagnant farm product prices.

Here we will look both at what Kings County farmers have said about the price of food, and also at an article on the subject published in *Rural Delivery*, partially reproduced here. David Robinson, NSDAF economist, has also made some pertinent comments on food prices, which are reproduced in Appendix III.

The anecdotal evidence presented here suggests that the stagnant price of farm products may be undermining farm viability in Nova Scotia. Future updates of this report will require more data and further analysis of the impact of food prices on farm viability to substantiate this hypothesis and to test the claims made by farmers and writers below.

That analysis should include, in particular, a detailed historical examination of prices paid by wholesalers and retailers to farmers, and of changing profit margins at all stages of the food supply chain. This is clearly a complex subject and involves a careful examination of the impact of retail food sector concentration on food prices and on prices paid to farmers, and of the impact of changing trade policies and changing trade patterns in farm products. This study does not attempt to explore these important issues beyond noting that they clearly have a profound effect on farming viability in Nova Scotia and Canada.

The comments quoted below are therefore intended simply to provoke discussion and to open the door to further research in this important area.

⁵⁶ Robinson, D. 1998. *Potatoes and Annapolis Valley Agriculture: Economics Report*. Halifax: Nova Scotia Department of Agriculture and Marketing.

⁵⁷ Campbell, M. 1994. Unpublished interviews with farmers in Nova Scotia about their ethical beliefs.

“The retailers and wholesalers are obviously not losing money.”

-Kings County vegetable farmer

“We [farmers] are the only component of the food system that does not demand a margin. The retailers and wholesalers sure do. They dictate our price, and if they can get it cheaper anywhere else they do!”

-Kings County vegetable farmer.

“If supply exceeds demand even by a little bit you get exploitation of the producer. The economic system we live under depresses prices. An economic problem is also a moral one. Marketing boards try to rectify this exploitation.”

-Kings County poultry farmer.

“(F)armers have to do what they can to survive. They can’t farm for the long-term. They over-use fertilizers or farm marginal land just to keep going.”

-Kings County poultry farmer⁵⁸

If we take an unregulated commodity such as apples as an example, we see that the price paid to farmers for top grade fresh fruit (i.e. not lower grade processing apples) is a small fraction of the retail price of the product. These proportions have not changed for many years. A three-pound bag of apples selling at \$2.79 in the store currently yields:

13.8 % of the price to the grower;

37.8% to the packer;

7.5% to the wholesaler; and

40.9% to the retailer.⁵⁹

A grower can increase his or her portion of the final price paid by the consumer by up to 50% through direct marketing the apples through U-picks and other outlets. But that option is currently only available for up to 25% to 35% of the entire crop, due to greater demand for store-bought produce.

In general, according to Dela Erith of the Nova Scotia Fruit Growers Association in Kentville, ***apple producers are currently getting one third less than the cost of production*** for their product. She argues that growers have to pull in a higher percentage of the final price of the product from the food chain. Otherwise, she says, they will not survive.

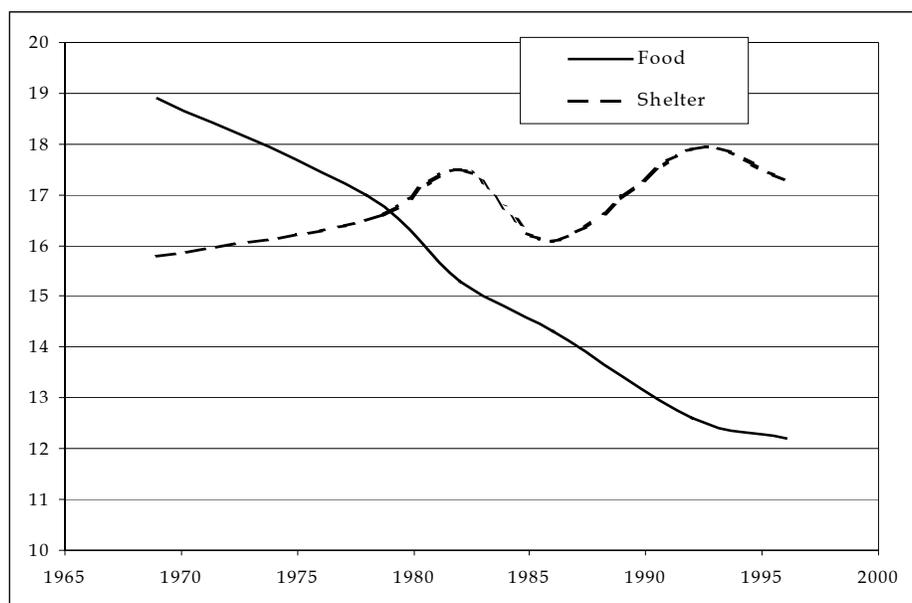
If we look further at the proportion of household income spent on food, we see a significant decline from the 1960s to the 1990s⁶⁰ (Figure 15).

⁵⁸ Campbell, op.cit.

⁵⁹ Figures for this example were provided by Dela Erith, Nova Scotia Fruit Growers’ Association, who was quoting NSDAM figures.

⁶⁰ Statistics Canada. 1997. *Family Expenditure in Canada*. Cat.no.62-555-XPB.

Figure 15: Percentage of Household Income Spent on Food and Shelter in Canada, 1969-1996



Source: Statistics Canada, *Family Expenditure in Canada*.

As a proportion of household income, there has been a steady and continuous decline in spending on food – by 35% in less than 30 years – in part because food prices have not increased at the same rate as other commodities and household expenditures.

Based on Statistics Canada and Agriculture Canada figures, we have estimated that total farm net income amounts to only 2.7% of what Nova Scotians spend on food.⁶¹ As low farmgate prices for food have been identified in this study as a cause of declining farm viability in Nova Scotia, future updates of this study might consider an increase in this low percentage over time as a positive indirect indicator of increasing farm viability.

⁶¹ In 1996, 34.5% of Nova Scotia food products from farms was exported (Agriculture Canada). The remaining 65.5% of total food cash receipts for that year (\$304,648,000) amounts to \$199.5 million worth of Nova Scotian-grown food that remains in the province. Since Nova Scotians spend an estimated \$1.8 billion on food, only 11.1% of that goes to farmers' total cash receipts for food sold. The 1996 total net farm income of close to \$50 million as a proportion of the \$1.8 billion worth of food expenditures for 1996 is 2.7%. Sources used: NSDAM, various years. *Nova Scotia Agricultural Statistics*; Statistics Canada. 1997 and 1993. *Family Expenditure in Canada 1996 and 1992*. Cat.no.62-555-XPB; AAFC. 1997. *A Portrait of the Canadian Agri-Food System*. Economic Policy Analysis Directorate. Downloaded from EPAD web page in pdf format. <http://www.agr.ca/policy/epad> Publication No. 1947E

3.4.1 Effect of Concentration in the Retail Food Sector on Food Prices⁶²

The following section is excerpted from *Rural Delivery* 24 (9): pages 32-35. (Used with permission). It is presented here as suggestive of the kind of hypotheses that deserve further investigation if low farmgate food prices and other market failures that currently threaten farm viability in Nova Scotia are to be reversed. Hypotheses suggested by the *Rural Delivery* articles are noted in bold as sub-headings.

Does Concentration in the Retail Food Sector Threaten Farm Viability?

“Aside from Co-op Atlantic in Moncton, there are now only two very large food retailers in the Maritimes. Empire Co. owns the familiar Sobeys stores. Loblaws Co. owns the IGA stores, as well as those shiny new Atlantic Superstores.... Both behemoths are the result of mergers which took place late in 1998, which also created the largest grocery wholesale companies this country has ever seen.

“Sobeys Canada, with annual sales of 10 billion (and climbing) ... is now the second-largest food distribution organization in Canada in terms of sales and geographic presence. ... Stellarton-based Empire Co., parent company of Sobeys, bought out the Oshawa Group..., as well as Knechtel, Food Town, Bonichoix and Price Chopper chains....(Loblaws bought IGA and Agora Food Merchants in Atlantic Canada, and Montreal-based Provigo.)....Loblaws was already Canada’s largest supermarket chain, with \$11 billion in annual sales.”

“[T]he bottom line is that the food industry is more concentrated than ever. The results have been positive for shareholders, but not so good for many Maritime growers who used to supply the chains.”

“Riverview [Herbs] co-owner John Sipos doesn’t see any single, diabolical force at work. ‘Consolidation is driven by the ‘logic’ of the marketplace. It’s just business,’ he says. But also aided by our tax dollars. The modern economy runs on cheap transportation -- (relatively) cheap fuel and government-built infrastructure -- an environment hostile to the small producer.

“‘In my mind, all food products that come into the Maritimes from outside are being subsidized in some way,’ he says, whether it’s taxpayer-funded irrigation projects in California, or the highway system. The price tags on our fruit and vegetables do not reflect the true cost of getting them there....”

⁶² These observations about the relationship between concentration in the retail food sector and prices of fruit and vegetables are taken directly from the following two articles: MacDonnell, K. 2000. “Buy really local”; and “Out from under the sprinklers,” *Rural Delivery* 24(9):32-35.

Does a Reduction in Buyers and Reliance on National Suppliers Threaten the Viability of Smaller Regional Producers?

“In the strange business of buying and selling produce, signed contracts detailing what and how much to plant and sell are almost unheard of. *‘The produce business is very much built on personal relationships,’* says [Peter] Rideout [NSDAM marketing specialist]. The mergers swept those relationships aside, ushering in a new tiny cabal of buyers. Not only are the new buyers unfamiliar with the region, they’re too harried to deal with numerous local suppliers.”

“Fifteen years ago, Atlantic Wholesalers had perhaps 20 separate distribution centres in the Maritimes. Now they have one. *‘They’ve gone from about 30 buyers down to two or three,’* says Neri Vautour, a business development officer with the New Brunswick Department of Agriculture and Rural Development (NBDARD).”

“The major chains have been making some changes in terms of who supplies their produce, generally switching from suppliers that provide items such as herbs to the Maritime stores to suppliers that can supply herbs to all stores across the country. Potato, herb, yoghurt, broccoli, onion suppliers were told not to deliver last fall because another supplier had been found.”

“Riverview Herbs co-owner Jim Bruce *“says, ‘Sobeys needed someone who could supply the whole chain from coast to coast, not just select stores in the Maritimes, and as well needed to reduce the number of suppliers in order to simplify bookkeeping.’”*

Does Concentration Lead to Downward Price Pressure for Growers?

(David Dawson, potato grower and packer from PEI:) *“‘It really feels that the big chains are putting a lot of pressure on producers to supply the product for nothing.’”*

(Peter Rideout, NSDAM marketing specialist:) *“‘Being a price-taker is nothing new for Maritime growers,’* says Nova Scotia’s Rideout, adding that the mergers will only make it worse as the chains continue to centralize their buying. *‘One of the changes that has happened with the mergers has been a trend towards national buying versus regional buying.’* ... Now national buying pits our growers against producers right across the country.... Probably as a consequence, he adds, fruit and vegetable prices have remained flat, despite drought and increased production costs. *‘Prices at the farm gate are not much different than they were five, even 10, years ago. But growers’ costs have at least doubled, if not more.’”*

Does Concentration Affect Food Value?

(John Sipos, Riverview Herbs:) *“‘The net loser here is the consumer because the consumers aren’t getting as fresh a product as they should be.’* He points out that

selecting vegetable varieties that store and travel well aren't necessarily the most flavourful. ...

“I just hope that in five or 10 years from now, it'll switch back and people will start to realize that price isn't everything, and that maybe there's actually more value in spending a few cents more and getting something of quality,” Sipos says. ‘Ultimately, it's the consumers who will drive the whole industry. If they start demanding better quality, then eventually I assume the grocery stores will give them what they want.’”

Are there Potential Grower Strategies to Improve Farm Viability?

(Peter Rideout, NSDAM marketing specialist:) “... (G)rowers who get together to form marketing groups and producer co-ops are able to take advantage of economies of scale. Farmers who market their produce jointly are more likely to specialize in one or two crops and increase acreage, a plus as far as consistency of supply is concerned. The several marketing groups that have already formed throughout the Maritimes [including in Kings County] are treated well by the chains.”

(Neri Vautour, NBDARD business development officer:) “ *‘What needs to be done is that the growers have to talk to each other and say, look, we're not each other's competition here' ...*”

Several important hypotheses clearly emerge from the remarks quoted here. The statistical data presented in this particular GPI report are largely descriptive. But there is a clear need for further *explanatory* investigation of the disturbing trends identified here, if enlightened policy initiatives are to reverse these trends and help enhance farm viability in Nova Scotia. The *Rural Delivery* analysis cited here, and the comments of those quoted in it, indicate the kinds of hypotheses that deserve investigation in follow-up studies that have the potential to demonstrate a positive way forward for agriculture in Nova Scotia.

4. Conclusion and Data Recommendations

All five indicators of farm economic viability (net farm income; expense to income ratio; return on investment; debt to net farm income ratio, and dependency ratio) in the Nova Scotia farm sector show that farm viability in Nova Scotia is being seriously eroded, and independence is being undermined. These disturbing trends are occurring even while farm cash receipts are growing, and while standard economic growth measures fail to signal problems. Yet, if current trends continue unabated, the future of Nova Scotia agriculture is clearly at risk.

At a Nova Scotia Federation of Agriculture Council of Leaders meeting⁶³ participants comments confirmed that despite increases in farm cash receipts and total agricultural output over the 28-year period under consideration, farmers are not benefiting from higher output. According to one producer present, “we’re doing better at getting poorer.”

Similarly, comments from Kings County farmers on farm viability, presented in chapter 3, appear to confirm concerns of increasing vulnerability in farm income, risk, and food price trends. Those comments also indicate that supply management, direct marketing, and producer co-operation have the potential to increase farm product prices relative to expenses, and thereby to enhance farm viability.

Other useful indicators that are not presently measured at the county or community level could help create a more accurate and comprehensive picture of farm sector trends and farming contribution to the economy. Four other indicators, measured at the community, county and provincial levels, are proposed here for future consideration to supplement the indicators and analysis presented in this report:

1) Farming spin-off effects to local business

The percentage of farm expense items originating within the county or province would ideally be 80% or more. This is currently not measured, but would provide a useful indicator of community self-reliance and of local spin-off from the farm sector to the immediately surrounding economy. This can also be a useful indicator of environmental sustainability, as a higher rate of local self-reliance and use of locally produced farm inputs indicates less reliance on transportation and fossil fuel combustion.

2) Multiplier effects of money spent by farms

A multiplier of two or more for all income earned on the farm would also indicate positive economic impacts on the surrounding community. The multiplier effect of

⁶³ April 16, 2001

farming is currently not systematically measured in Nova Scotia, although some estimates do exist.⁶⁴

3) Ratio of food market prices to production costs

A healthy farming sector at the community level would be indicated by farm gate prices (for good quality food) that are higher than the cost of production. This would ensure that the grower can invest in long-term farm sustainability. Without such a margin for investment, farmers cannot invest in capital equipment, improved methods of production, or soil conservation. This ratio of market prices to costs of production is currently not tracked in Nova Scotia even though all the data are available for compilation and assessment.

4) Relationship of price and quality production

The viability of any business must reflect the marketability of its product, including both quality and quantity of production. If a farm tries to market poor quality produce, or quantities of food insufficient to realize even modest economies of scale, its income will suffer.

In the interviews with farmers in Kings County, Nova Scotia, one farmer pointed out that ‘real quality of food’ including nutritional value, must be more accurately reflected in food prices. Farmers should be paid more for what they produce, he maintains, only if they are producing a quality product. GPI Atlantic intends to examine the whole issue of food quality more thoroughly in the fourth report of the GPI Soils and Agriculture Accounts (see Appendix I).

4.1 Causes and dynamics of decreased viability and Future Research Directions

Understanding the causes and dynamics of decreased farm economic viability naturally suggests potential solutions. For example, an Ontario study comparing conventional, reduced input, and organic production systems demonstrated the net income-enhancing potential of reducing external farm inputs on the one hand and of commanding a higher product price in the marketplace on the other hand (Table 11). GPI Atlantic will explore this potential in greater depth in future reports.

Such further analysis must distinguish carefully between different kinds of farm inputs and whether they degrade or enhance resource capacity. Clearly the study cited below is based on a small sample, and we make no claims to its statistical validity at this point. It is presented here only because it is suggestive of the kinds of hypotheses and research directions that may help inform policy and enhance farm viability in the future.

⁶⁴ For example, David Robinson estimates that the purely local employment multiplier for the potato sector in Kings County, Nova Scotia would be in the range of 2.0 to 2.1. Robinson, D. *Potatoes and Annapolis Valley Agriculture*, Economics Report, NSDAM, Halifax, 1998, p.6.

Table 11: Ontario Study Comparing Economic Viability of Conventional, Reduced-Input, and Organic Crop and Livestock Farms⁶⁵

| Farm type | Government Transfer Payments | Total Gross Income | Total Expenses | Net Farm Income |
|------------------------------------|------------------------------|--------------------|----------------|-----------------|
| | Average \$ per farm | | | |
| Conventional (average of 9 farms) | 17, 997 | 246,476 | 240,646 | 5,830 |
| Reduced Input (average of 9 farms) | 16, 568 | 245,529 | 211,945 | 33,584 |
| Organic (average of 7 farms) | 3,269 | 126,526 | 104,478 | 22,048 |

Source: Stonehouse (1996)

A thorough examination of other causes and dynamics associated with farm viability, would also include an analysis of:

- comparative levels of household food expenditures in different countries,
- comparative levels of subsidies to farmers, and
- the relative market power or profit levels of each component of the food system.

For example, the National Farmers Union has produced a detailed assessment of the causes and dynamics of declining farm income in western Canada. The NFU claims that the cause of declining net farm income is the disproportionately low portion of the food dollar that is allocated to the farmer relative to upstream (input suppliers) and downstream (wholesalers, packers, processors, retailers) components of the food industry.⁶⁶ Since that conclusion parallels several of the comments in the *Rural Delivery* articles cited above, a similar analysis should be conducted for eastern Canada.

The need for such policy-relevant research and for bold policy initiatives based on thorough investigation is urgent. A continuation of current trends and of further erosion of farm viability threatens the future of the agriculture industry in Nova Scotia and can potentially undermine the province's food security.

The preliminary evidence presented here suggests that declining farm viability may be related to a combination of the following factors:

⁶⁵ Stonehouse, D.P. 1996. *Initial Technical and Economic Comparisons of Different Farming Systems in Ontario, Canada*. Biological Agriculture and Horticulture, 13: 371-386.

⁶⁶ National Farmers Union, 2000. *The Farm Crisis, EU Subsidies, and Agribusiness Market Power*. Brief presented to the Senate Standing Committee on Agriculture and Forestry, Ottawa, Ontario, February 17, 2000.

- High input costs relative to farm product prices
- Rising wholesaler, processor, or retailer returns relative to farm product prices
- Trade pressures from outside the region
- Lower consumer food expenditures as a percentage of total household expenses compared to other OECD countries
- Declining payments to farmers relative to other OECD countries

As noted above, the purpose of this report is only to provide a descriptive analysis of farm viability. However, further analyses should address these and other causal and explanatory variables. In addition, future GPI Atlantic reports will also examine resource and social capacity as potential determinants of farm economic ability.

Appendix I: Genuine Progress Indicators in Agriculture⁶⁷

The Limitations of Current Measures

Conventional measures of progress based on economic growth and market statistics alone send misleading, inaccurate and even dangerous signals to policy makers, producers and the general public. The more trees we cut down and the more quickly we cut them down, the more fish we sell, and the more fossil fuels we burn, the faster the economy will grow -- at least for a while.

Our economic growth measures ignore the value of natural and social capital and do not account for its depletion or depreciation. This is like a factory owner selling off his machinery and counting it as profit, regardless of the diminished future flow of goods and services.

In conventional national accounting practices, therefore, no account is taken of the health of the natural capital base on which the economy and the long-term prosperity of society completely depend. No early warning signals reach policy makers that could prevent a natural resource collapse such as occurred in the Atlantic ground-fishery.

Economic growth measures also make no qualitative distinctions between economic activities that create benefit and those that signify a decline in wellbeing. Thus, crime, sickness and pollution all contribute to economic growth simply because money is spent on prisons, security systems, drugs and pollution clean up. When economic growth measures are conventionally used to assess how "well off" we are, these liabilities are mistakenly counted as contributions to prosperity and wellbeing.

This accounting and policy flaw has particularly serious implications for agriculture, on which our future food security literally depends. When progress is measured simply by crop yields and current income, the long-term health of soil, water, environmental resources and farming communities, -- the natural and social capital base on which food production depends -- is overlooked.

Agriculture Canada researchers have found that the organic-matter content of eastern Canada soils has fallen by 30-40% since the 1960's alone. Over the longer term, researchers note that "more than 200 years of agriculture in the Atlantic provinces has resulted in serious soil degradation in some areas of intense row-cropping, seen in the loss of organic matter and fertility, structural degradation, compaction, and erosion."⁶⁸ Fortunately, Nova Scotia suffers less soil degradation than New Brunswick and PEI because of its lower proportion of intensive row crops.

⁶⁷ See Appendix III for reviewer comments on this section.

⁶⁸ Government of Canada, 1991. *The State of Canada's Environment*. Ottawa: Minister of Supply and Services: 9-1. Acton, D. and Gregorich, L. (eds). 1995. *The Health of Our Soils*. Agriculture and Agri-Food Canada, Centre for Land and Biological Resources Research Branch. Publication 1906/E: 11.

Current accounting mechanisms have no way to incorporate these scientific insights into the measures of progress that send signals to the policy arena. In fact, these measures send the opposite message. Soil degradation, for example, can be temporarily masked by intensive chemical fertilizer use. But such inputs, while they temporarily maintain high yields, make farming more expensive and cannot restore soil quality.

In 1985, the last time such an estimate was made, Agriculture Canada estimated the on-farm costs of soil degradation in Atlantic Canada at about \$11.5 million per year, or \$2,685 per farm (20% of average net farm income at the time). Off-farm costs of soil degradation through run-off, sedimentation, and other losses of soil materials, nutrients and pesticides from agricultural lands were estimated at \$46 per hectare of conventionally produced row-crops.⁶⁹

It is essential to incorporate such hidden costs into our accounting mechanisms if we are to have a more accurate and comprehensive measure of economic health and wellbeing than is currently available.

Accounting for Natural Capital

The need for better measures of progress has now been almost universally recognized. The 1993 revisions to the internationally accepted System of National Accounts, recommended that natural resource accounts be incorporated into national balance sheets and that governments move towards a system of "integrated environmental and economic accounting."⁷⁰ Statistics Canada has begun this transition with its new *Canadian System of Environmental and Resource Accounts*⁷¹, and the year 2000 federal budget was the first to make a specific allocation for this purpose. GPI Atlantic is a member of the new sustainable development indicators steering committee of the National Round Table on the Environment and the Economy charged with the task of developing these indicators.

As well, considerable advances in natural resource accounting have been made outside government, by groups like the World Resources Institute, the International Society for Ecological Economics, and by independent academics and researchers. Composite measures of progress that include natural capital values have been developed by Redefining Progress (the original US Genuine Progress Indicator), by Nordhaus and

⁶⁹ Agriculture Canada. 1986. *A Preliminary Economic Assessment of Agricultural Land Degradation in Atlantic and Central Canada and Southern British Columbia*. Prepared by the Development Consulting House and Land Resource Research Institute, Agriculture Canada. Principal Authors: M.G. Fox, and D. R. Coote.

⁷⁰ United Nations, *Handbook of National Accounting: Integrated Environmental and Economic Accounts*, 1993, United Nations Department of Economic and Social Information and Policy Analysis, Statistics Division.

⁷¹ Statistics Canada, *Econnections: Linking the Environment and the Economy: Concepts, Sources and Methods of the Canadian System of Environmental and Resource Accounts*, catalogue no. 16-505-GPE, December, 1997; and *Econnections: Linking the Environment and the Economy: Indicators and Detailed Statistics, 1997*, catalogue no. 16-200-XKE, December, 1997.

Tobin at Yale University (the Measure of Economic Welfare), by Osberg and Sharpe (the Index of Economic Well-being), and others.⁷²

The Nova Scotia Genuine Progress Index is a contribution to these efforts. Of the 22 components of the Nova Scotia GPI, there are five natural resource accounts, including soils and agriculture, which explicitly value natural capital assets and measure their depletion and degradation as depreciation. Conversely, restoration efforts are valued as "re-investments" in natural capital. From that perspective, the ecological and socioeconomic sustainability of current harvesting practices and consumption patterns can be assessed.

Current accounting procedures like the Gross Domestic Product that ignore natural capital depreciation mistakenly inflate the net value of economic activity. GPI methods, on the other hand, more closely follow business accounting practices that distinguish assets from liabilities, and capital investments from current income.

The GPI Soils and Agriculture Accounts: An Overview

Because the soils and agriculture component of the GPI is particularly complex and multi-dimensional, requiring different assessments for different agricultural sectors, GPI Atlantic will release the results of nearly three years of research in sections over the next year. This is the first of several summary releases of data presenting highlights of results, after which the full GPI soils and agricultural accounts will be released with all details.

The GPI Soils and Agriculture reports will include the following key features:

- 3 Realistic valuations of previously unaccounted benefits and costs of farming and farming-related activities.
- 4 Use of full-cost accounting methods to compare the long-term real economic benefits and costs of different farming scenarios and methods, including the economics of both conventional and ecological farming practices.
- 5 Analysis of "best practices" and community-based initiatives that enhance the full range of farming values -- including soil and water quality, food security, community resilience, and financial viability and prosperity.

⁷² Cobb, Clifford, Tom Halstead and Jonathan Rowe, *The Genuine Progress Indicator: Summary of Data and Methodology*, Redefining Progress, San Francisco, 1995; Messinger, Hans, *Measuring Sustainable Economic Welfare: Looking Beyond GDP*, Statistics Canada, Ottawa, 1997, (includes critique of both the US GPI and of Nordhaus and Tobin's MEW); Osberg, Lars and Andrew Sharpe, *An Index of Economic Well-being for Canada*, paper presented to the Conference on the State of Living Standards and the Quality of Life in Canada, Centre for the Study of Living Standards, Ottawa, 1998.

- 6 Identification of key linkages between economic, social, ecological and institutional variables in agriculture. (A primary function of the GPI is to elucidate these linkages).
- 7 Practical relation of indicators to key current issues in agriculture, including trends over time in farm viability and employment; soil quality; use of non-renewable vs. renewable resources; manure and nutrient handling; farm product quality; consumer-producer relations; and import replacement and export generation strategies.
- 8 Integration of currently scattered data sources: A key function of the GPI is to draw together and apply key research findings from both government and independent expert studies in an integrated set of indicators and accounts.

Analytical reports and discussion papers will include the following subject areas (in order of proposed data release). About ten reports will be released at regular intervals starting in April, 2001, with the final summary report scheduled to be released in March 2002.⁷³

- I. The analysis begins with a very fundamental question: Does it pay farmers to farm? The financial viability of farming in Nova Scotia today will be assessed with reference to trends over time, including analysis of farm input costs in comparison with revenues, debt/income ratios, and returns on investment for different agricultural sectors. Future updates of this report will also include a comparison of several cost-reduction and production expansion scenarios.
- II. Soil quality, including soil organic matter, erosion and compaction, and best practices in building soil quality.
- III. Trends in pesticide use, including a full range of costs and benefits. This report will include a cost/benefit analysis of the services provided by beneficial insects, birds, and soil organisms. Practical experience and lessons from Nova Scotia, Quebec, Ontario, and several European countries will be included in the analysis.
- IV. Trends in nutrient use: real costs and real benefits. Various sources of crop nutrients will be analyzed based on production, transportation, application, yield benefits, crop quality, greenhouse gas emissions and other externalities, and the sustainability of various systems.
- V. Livestock yield and quality trends, ruminant and non-ruminant.
- VI. Export generation and import replacement strategies: real benefits and costs including externalities and sustainability indicators.
- VII. Community resilience. With the assistance of farmers and community development experts, GPI Atlantic has developed a set of rural community

⁷³ Schedule and work plan dependent on funding.

resilience indicators. Trends in all the indicators will be analyzed with reference to the real costs and benefits of a number of development options.

- VIII. Biodiversity. This report will include biodiversity of land use, habitat, and wild species, as well as crop and livestock species. The costs and benefits of ecological balances will be included along with threshold analysis and trends in sustainability indicators.
- IX. Employment. This is a vital subject from the point of view of genuine progress, and links ecological variables directly to socioeconomic outcomes. Labour productivity and other efficiencies will be compared using the GPI full-cost accounting model. Genuine progress indicators in employment will be tracked over time, and will include indicators of direct relevance to employer concerns.
- X. Final report on proposed core indicators, summary results to match indicators, and recommendations for annual benchmarks of progress and targets for movement towards sustainable agriculture from the economic, social, ecological and institutional perspectives.

This first data release on Farm Economic Viability in Nova Scotia' examines trends in income and expenses; farm product prices; return on investment; debt; subsidies; and other measures of farm viability. The impacts of trends presented in this first report will be discussed in Reports II through X.

Appendix II: True Value Tables

The True Value Tables presented here include both market and non-market indicators of sustainability and long-term economic viability. These tables are a preliminary attempt to provide a framework for future GPI Atlantic reports and demonstrate how many vital aspects of farm activity are not measured in conventional market-related statistics. It is hoped that future reports will progressively include more of the important non-market indicators noted in these tables.

True Value – Farm Level

| Marginal - Operating | | |
|---|--|--|
| Outputs | Inputs | Net result |
| <p>Revenue</p> <p>+ market goods (cash receipts)</p> | <p>Expenses</p> <p>+ inputs</p> <p>+ depreciation on buildings, machinery and other capital costs</p> <p>+ loan payments (interest)</p> <p>+ compensatory costs (e.g. irrigation, pest control)</p> <p>+ defensive expenditures (e.g. adding soil organic matter, building a concrete manure pad)</p> | <p>Revenue – Expenses = Net Farm Income (NFI)*</p> |
| <p>Non-market revenue</p> <p>3 non-market goods (e.g. scenery, lifestyle benefits, food and other farm products that don't have to be purchased, knowledge and experience, health benefits)</p> <p>4 non-market bads (externalities) (e.g. excess nutrients leaching away, spray drift, and other potential 'pollution')</p> | <p>Non-market expense</p> <p>+ unpaid labour</p> <p>+ interest on equity</p> <p>+ stress and health costs</p> <p>+ costs of farm accidents</p> | <p>Non-market revenue – Non-market expense = Net Non-market Farm Income (NNFI)</p> |
| NFI + NNFI = Real Net Farm Income | | |

* Note: the health of net farm income is assessed using a number of indicators... expense to income ratio (%), return on investment (%), total debt to net farm income ratio (%), dependency ratio (%).

True Value – Farm Level (2)

| Fixed - Capital | | |
|--|---|---|
| Outputs | Inputs | Net result |
| <p><i>Assets</i></p> <ul style="list-style-type: none"> + Real Net Farm Income (RNFI) [otherwise known as profit] + Capital value of buildings, infrastructure, equipment and machinery, livestock + Inventory change (+ or -) + Land value [real estate value?] ?? | <p><i>Liabilities</i></p> <ul style="list-style-type: none"> + total debt (short term and long term) + vandalism, fire, theft | <p>Assets – Liabilities = Net Farm Equity (NFE)</p> |
| <p><i>Non-market Assets</i></p> <ul style="list-style-type: none"> + Land value (productive capacity) including <ul style="list-style-type: none"> • capacity and quality of soil • capacity and quality of water • capacity and quality of livestock resources • capacity and expertise of farmer and other operators • capacity to withstand stress such as drought, flood, pests, toxics, weeds (resilience) | <p><i>Non-market Liabilities</i></p> <ul style="list-style-type: none"> + Depreciation of productive capacity including <ul style="list-style-type: none"> • pollution from external sources • environmental stress (e.g. UV intensity, drought, flood, pests etc) • borrowed productive capacity today resulting in decreased productive capacity tomorrow (i.e. resource debt) + Inherited property ??? | <p>Non-market Assets – Non-market Liability = Net Non-market Farm Equity (NNFE)</p> |
| <p>NFE + NNFE = Real Net Farm Equity (RNFE)</p> | | |

True Value – Community Level

| Marginal - Operating | | |
|--|--|---|
| Outputs | Inputs | Net result |
| <p>Revenue</p> <ul style="list-style-type: none"> + Business activity (including goods and services; employment, festivals etc) + Taxes paid to municipality from these activities | <p>Expenses</p> <ul style="list-style-type: none"> + subsidies + services (school, health etc) + infrastructure maintenance (roads, water, government) + depreciation on infrastructure, community amenities | <p>Revenue – Expenses = Net Community Income (NCI)</p> |
| <p>Non-market revenue</p> <ul style="list-style-type: none"> + food availability, freshness, security + range and # of farm products (diversity) as well as quantity + range and # of farm product buyers + range and # of farm-related organizations and activities (e.g. 4H, soil and crop improvement, farm tours, farm-based research) + public understanding of agriculture (meaningful and constructive relationships between farmers and consumers) + quality (goodness) of food not reflected in price + cultural opportunities, recreational opportunities + training opportunities + use and appropriateness of community amenities (e.g. health centres, research facilities, schools, libraries, parks) + non-food farm products <ul style="list-style-type: none"> water filtration (+) water pollution (-) air filtration (+) air pollution (-) wild spaces (+) wildlife habitat (+) destruction of habitat (-) knowledge (+) pulling people out of the ditch (+) land caretaking (+) | <p>Non-market expense</p> <ul style="list-style-type: none"> + volunteer time + donations (community halls, food banks) + depreciation of value of farm and natural features + pollution and degradation from other sectors that negatively affects agriculture (e.g. ground level ozone, trespassing, industry pollution of water, greenhouse gas effects on climate) + nuisance complaints + quality (badness) of food not reflected in price | <p>Non-market revenue – Non-market expense = Net Non-market Community Income (NNCI)</p> |
| NCI + NNCI = Real Net Community Income | | |

True Value – Community Level (2)

| Fixed - Capital | | |
|---|--|--|
| Outputs | Inputs | Net result |
| <p>Assets</p> <ul style="list-style-type: none"> + Real Net Community Income (RNCI) [otherwise known as profit] + Community amenities (school, health centre, library, post office, community halls, child care, farmers markets, exhibition grounds) + Range and # of farms + Range and # of farm-related business (resilience) + Community infrastructure such as roads + Research and demonstration facilities + Inventory + Land value [real estate value?] ?? | <p>Liabilities</p> <ul style="list-style-type: none"> + total debt (short term and long term) + vandalism, fire, theft + depreciation of community amenities (borrowing today for reduced capacity to maintain amenities tomorrow) | <p>Assets – Liabilities = Net Community Equity (NCE)</p> |
| <p>Non-market Assets</p> <ul style="list-style-type: none"> + value of natural features on farms and farm land, woodland, fields, wetlands, wild areas (e.g. aesthetic value, buffer value (flood control, watershed supply), filter value (water and air filtration), habitat value (beneficial insects and wildlife)) + social value (training for business, and a host of other skills) | <p>Non-market Liabilities</p> <ul style="list-style-type: none"> + loss of farms + loss of farming infrastructure (processing and storage facilities etc) | <p>Non-market Assets – Non-market Liability = Net Non-market Community Equity (NNCE)</p> |
| <p>NFE + NNFE = Real Net Community Equity (RNCE)</p> | | |

Appendix III: Reviewer Comments

In general, reviewers were a little uncomfortable with the thresholds for sustainability outlined in this report. The author acknowledges that this discomfort is justified. The thresholds are approximations based on the reference points noted in the text. However, they are not carved in stone, as stated in the introduction:

‘Sustainability thresholds’ are proposed here that are based as far as possible on thresholds established in the literature. When no established thresholds for sustainability (or viability) exist, we have chosen thresholds that are both achievable (i.e. they *have* been achieved in representative times and places) and/or necessary for long-term viability. Establishing such thresholds, of course, is part of the discussion that must take place when proposing new indicators of real progress. The thresholds proposed here may require adjustment over time as conclusions from new studies and actual experience are incorporated in the analysis.

The author and GPI Atlantic therefore welcome input that can make these threshold assessments more accurate.

Reviewer comments that have not been taken into account in the text of the report will be reproduced here as additional information for the reader.

2.1 Total Farm Cash Receipts

David Robinson, NSDAF: “...The reported 12% real increase in farm cash receipts over 28 years is less than I might have guessed. The 1997-98-99 droughts would be a small factor. More importantly it should be recognized that farm production has increased to a greater extent [than farm cash receipts]. For industries achieving sizeable cost decreases, GDP or aggregate sales figures understate the increase in output when the general price level is used to deflate values...

“Consider chicken production. In 1971 N.S. production of hens (spent fowl) and chicken was 9,413,000 kg and in 1999 production was 3.24 times as much at 30,533,000 kg. The general price level as represented by the CPI was 4.44 times higher in 1999 compared with 1971 (110.5 vs 24.9 with 1992=100). In the absence of cost reducing technical change the farm returns of \$5.651 million in 1971 might have been expected to have increased by a factor of 14.39 (3.24 x 4.44) to \$81.3 million. The farm returns from 1999 production however were only \$49,142,000. The indicated consumer benefits are sizeable -and are still understated as I have not differentiated between low quality spent fowl and higher value chicken which accounted for a greater portion of production in 1999 as compared with 1971.

“Another example involves hogs where the Nova Scotia base price averaged \$25.09 in 1971 vs \$56.95 in 1999 (and \$53.76 in 1973). Hog marketings are now twice the 1971 level (but actually peaked provincially in the 1980s). The amount of feed, labour and other inputs utilized per unit of production on both poultry and hog farms is substantially lower today than it was in the 1970's. Provincially sectors like eggs, apples, cattle, and grain haven't increased production to the same extent but in real terms prices are lower as well so the use of the CPI to deflate market returns similarly understates the production level.

“Gains such as these delivered by the agricultural system since World War II have been a major contributor to the large increase in standards of living including society’s ability to offer greater social security , educational opportunities, health care and so on....”

David Robinson makes the point that although total farm cash receipts have not increased substantially over the last 28 years, production has, offering substantial societal benefits. Two questions result. Are the soil, the livestock, the farmers, or rural communities benefiting from increased production? And, will societal benefits continue if farmers can no longer maintain their operations because their viability is at stake?

2.2 Expense to Income Ratio

Gary Patterson, AAFC, responded to the statement that “the higher the expense ratio is... the more risky farming tends to become.” Risk also depends on the type of farming, the market prospects, and other factors like the skill of the operator. The author agrees with this comment. Dairy farming, for example, can more easily handle a higher expense ratio than an apple producer because it has guaranteed income from supply managed milk products.

David Robinson, NSDAF: “There are two major causes of the increase in the expense ratio over time. First agriculture globally (excluding possibly Cuba and North Korea) is using more purchased inputs per unit of production. There’s nothing inherently sinister about this trend. Consider A.I. [artificial insemination] and dairying or consider today’s hay making systems compared with haying prior to hay balers (and of course hay balers changed the scale of farming). ...[there is a] slight increase in the agricultural related services GDP relative to the primary agriculture GDP which is part of this trend. Sometimes there are developments in the opposite direction such as when farms find it advantageous to do more on farm feed milling but the general direction to using more purchased inputs is clear.

“More importantly and more specific to our local situation [is] the termination of and reductions in a wide range of indirect and direct input subsidies is the principle factor behind the trend you are considering. The largest purchased input used by Nova Scotia agriculture is feed. Until the mid 1970's the federal feed grain policy kept feed grain costs similar in all farming areas across Canada. In the early 1970's feed grain prices here were essentially the same as in western Canada and Ontario. While our relative costs increased in the late 1970's and 1980's Feed Freight Assistance (the most important feed policy element for N.S.) was paid until Dec.31 1995. FFA was an indirect subsidy and when it was ended producers received direct lump sum adjustment payments in 1996-97 which were the equivalent to three years and a bit of the terminated freight assistance. (These one time “good bye / good luck” payments were part of the higher program payments you have identified in the late 1990's). If feed prices today were at the Ontario level farming expenses would be reduced by over \$10 million and the expense to income ratio would be correspondingly lower. (As you may know N.S. hog farms have a cost competitive problem. This did not arise from technologically lagging their North American counterparts but rather from this change in national farm policy.)

“FFA is only one of a number of long standing and shorter life programs which have been terminated over the 1971-99 period that you are looking at. Another one on the feed transport side was the Atlantic Region Freight Program which used to pay a small subsidy on manufactured feed shipments from mills to farms (and on milk shipments from farms to plants). Other more sizeable ones included provincial subsidies for fertilizer, lime, long term credit / interest subsidies, beef heifers for breeding and a range of smaller measures such as support for A.I. ,

Dairy Herd Analysis Services / ADLIC, bee hive transport , generators, sheep fencing etc. Under the series of federal-provincial agricultural development agreements stretching from the 1970's into the 1990's assistance was paid on a wide range of capital projects and items (and sometimes on operating expense items). Included were fruit trees, greenhouses, irrigation, maple pipelines, silos and other forage and grain storage facilities, fruit and vegetable storage, hog barns, other farm buildings, drainage and other land improvements, breeding stock and so on. Only a low level of these capital assistance measures fed immediately or directly into lower operating costs but depreciation was of course reduced as were financing costs / debt levels.

“... The increasing concentration in the food retail sector certainly creates some demanding situations for suppliers but there is little or no evidence that it has in any major way “depressed prices paid to producers” for major commodities. Some favorable pricing arrangements for lesser products have been disrupted by the intensified competition among retailers and producers with farm markets will tell you that this has impacted upon their business...”

Comment on the statement that:

.....the price of food in stores has sharply outpaced farm gate prices, indicating that food sector profits are accruing to the retail sector rather than to producers.

“The two major causes of lower real farm prices relative to retail product prices are cost reducing technical change in agriculture (as discussed ... above) and the trend to greater value added in retail products (and perhaps more service) at the retail level. The Canadian food retail sector operates on low margins and is fiercely competitive. Consider Sobey’s profits. If you prorated them for the (rough) portion of sales contributed by N.S. farm products the amount of money would not be great. Sobey’s net earnings in the second quarter were \$23.2 million from sales of \$2.85 billion (8 cents per \$100 of sales). These earnings arose from an operation which involved 32,000 employees, 1,000 stores and had a 19 % national market share.”

Author’s comment: True, the Canadian food retail sector is fiercely competitive, and may operate on low margins. But those margins are calculated after half-decent salaries are removed for the ‘operators’, whereas farmers tend to have to take on other jobs and sideline businesses because they do not get a salary from their farming business. An exception to this will be farmers in supply-managed commodities.

2.3 Return on Investment and 2.4 Debt to Net Farm Income Ratio

David Robinson, NSDAF: “The size of farms is increasing as is the capital intensity of the industry. Consequently financing costs are increasing relative to overall earnings or the value of output. The average size of farms is increasing because of economies-of-size and the (frequently related) increased use of capital similarly is driven by cost savings. These trends are exasperating the “live poor die rich” aspect of farming. A number of financing strategies are likely to increase. Locally the 1997-98-99 droughts were a factor in the increased debts over the most recent period.

“Also it should be noted that a disproportionate share of the increased farm lending in recent years in Nova Scotia was undertaken by dairy and poultry farms. (Refinancings and consolidations have been continuing in dairy and in the case of poultry many new barns are being built. The chicken production previously undertaken by Maple Leaf has also been acquired by private producers -as has the potato land previously owned by Hostess-Frito Lay / Pepsico.) The demise of federal-provincial development agreements removed the source of most capital subsidies and is a factor in the increase in the total debt to net farm income ratio as is the drop in the overall public support provided to agriculture.”

2.5 Dependency Ratio

David Robinson, NSDAF: “Overall public support for Canadian and Nova Scotia agriculture declined in the 1990's. While Direct Program payments in Nova Scotia were higher the decreases in indirect and input subsidies were larger. (see above). Payments related to the 1997-98-99 droughts and the FFA compensation payments in 1996-97 were factors. (FFA was paid indirectly between 1941 and 1995 but the final “buy out” package went directly to farms.) Also Nova Scotia (and eastern Canada) is now receiving a higher proportion of federal safety net dollars as compared with the past.

“Program payments have always been less significant in Nova Scotia as compared with overall Canadian agriculture and such payments in aggregate will still be well under the national average relative to market receipts and even more so relative to GDP. The national NISA and AIDA programs are part of the increases in direct payments locally. Nevertheless the two largest programs for Nova Scotia agriculture in terms of “Payments Enhancing Receipts” for many years were the federal dairy subsidy which is being phased out and provincial hog support -which in recent years has taken the form of contributions to Pork Nova Scotia’s Risk Management Service which was terminated this year.

“The 1990's cuts to farm programs are often associated with the 1994 WTO Agreement on Agriculture but were really brought about by domestic fiscal pressures / public finances. Canada was below our commitment levels for reductions in export subsidies and domestic support before the Agreement was signed. In the past Canada’s ranking for the level of support provided to agriculture was always between the E.U. and U.S. levels but we have dropped in the international rankings and are now below both. As you may know agricultural subsidies are a “rich man’s game” and are detrimental to third world agriculture (and to agriculture in developed countries and provinces with high debt-to-GDP ratios. See “World Agriculture in Disarray” by D. G. Johnson). One of Canada’s objectives at the WTO is to secure “a (more) level playing field.”

Appendix I: Genuine Progress Indicators and Agriculture

Gary Patterson’s comment (AAFC) about the GPI’s plan to include natural resources in the accounts: “Current measures do not generally include soil, water, environmental and other resources for a number of reasons. Their value is very difficult to measure. Those resources are assumed to be infinite, or nearly so. These resources can no longer be considered infinite.”

David Robinson (NSDAF) responded to the claim that in 1985....Agriculture Canada estimated the on-farm costs of soil degradation in Atlantic Canada at about \$11.5 million per year.

“I don’t have a copy of this report (I may have seen it years ago) but I’m certain that Nova Scotia’s share would have been disproportionately small relative to farm output. While Nova Scotia has the largest farm sector in the region (one and a half times as large as P.E.I.’s) I’m guessing that Nova Scotia’s estimated costs were a fifth or less of the Atlantic Canada figure ?? This isn’t because our soils are less prone to erosion (quite the reverse) or our farms are doing a better job in this regard but because row crops account for a much smaller share of agricultural production in this province. Our light soils and rolling terrain / fields are of course very prone to run-off. (I’ve picked tobacco sand leaves many days in the rain and witnessed this at length and very, very closely.).

“This is a good illustration of why the anti-trade sentiments of some environmentalists are wrong-headed. A major reason why our industry doesn’t grow more potatoes or why we “import” most of our potatoes for example is because of the high (private / on-farm) costs of soil erosion here. While these costs are significant on P.E.I. on a per tonne of potatoes grown basis they are lower there than the costs here at the margin -for expanded production. This does not mean necessarily that our current potato acreage incurs more soil loss compared with P.E.I. but if we were to produce say 10,000 acres (to achieve “self-sufficiency” for some non-economic reason) that would be the case.”

He also responded to the following statement: The GPI Soils and Agriculture reports will include the...use of full-cost accounting methods to compare the...economic benefits and costs of different farming scenarios and methods, including the economics of both conventional and ecological farming practices.

David Robinson: “Agriculture is a science and technology based industry. If you globally compare agricultural regions or sectors which have advanced against those that have lagged (over the past fifty years or so) natural resource endowments have little explanatory power. Science and technology resources on the other hand will stand out as the key determinants. Agricultural Science has delivered a major component of the gains in living standards and in the quality of life enjoyed today. Public perceptions have become a new consideration and concern for new science based technologies. While there are positive aspects of such public awareness and interest the voice of science illiteracy is often loud in important public debates. The politicization of agricultural science has the potential to become increasingly costly for our society.

“At the farm level a technology as benign and as beneficial as artificial insemination would no doubt generate considerable controversy if introduced for the first time today. Consider the GMO potatoes that were being grown before McCains stopped buying them because of bad publicity. These potatoes were environmentally friendly, output increasing and cost reducing. As you know the McCains are one of the wealthiest families in Canada and any health risks would have exposed them to huge liabilities but there was no question of any such risks. They stated clearly that they had no reservation about these potatoes at all. Will your assessment of alternate practices include such technologies as GMO potatoes or say rbST in dairying ? (GMO potatoes of course use less pesticides and both of these technologies would tend to reduce the average soil loss per unit of production.)”