

# **Measuring Sustainable Development**

## **A NOVA SCOTIA PILOT STUDY**

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**CENTRE FOR THE STUDY OF LIVING STANDARDS**

**Conference on the State of Living Standards and the Quality  
of Life in Canada**

**Ottawa, October 31, 1998**

## **1. Background and Purpose**

In the last 15 years, outstanding work has been accomplished by international organizations, national statistical agencies and independent research institutes and experts, in developing the methodologies for expanded measures of progress integrating social, economic and environmental variables. Statistics Canada has been in the forefront of this work with its time use surveys, its new Total Work Accounts System and the new Canadian System of Environmental and Resource Accounts.

The System of National Accounts 1993 has encouraged these developments globally with recommendations for the development of satellite accounts measuring unpaid work and proposing a system of integrated environmental and economic accounts. The recognition that natural capital assets are subject to depletion and depreciation has spurred the adoption of natural resource accounts by several national statistical agencies and their integration into national balance sheets.

New comprehensive indices of progress, such as that presented at this conference by Lars Osberg and Andrew Sharpe, and earlier work by Clifford Cobb, Nordhaus and Tobin, and others, have challenged the narrow reliance on market statistics alone as an accurate measure of societal well-being and prosperity. The time is now ripe for an integrated policy-relevant application of these new measures in such a way that policy makers can draw on them in their planning processes to protect and build on existing social and environmental assets and to respond to early warning signals of potential deterioration.

Atlantic Canada seems particularly ready for such an experiment for two reasons. First, the region has experienced first-hand the economic effects of the loss of a natural capital asset, and policy-makers are acutely aware of the necessity of valuing natural resources accurately to avert similar crises in the future. Secondly, the region has never had the illusion that it was particularly prosperous by conventional economic standards, and there is a certain readiness and interest among policy-makers to examine alternative measures.

The Nova Scotia pilot project being conducted by GPI Atlantic with assistance from Statistics Canada aims to flesh out the separate components of prior indices of social progress in detail, to link statistical analysis with policy implications, and to develop methodologies so they can be easily and accurately applied in practice. From the start, it was decided to draw on the best existing methodologies and published data sources rather than to generate new ones, and to focus on practical application as the major priority. In this way, it is intended to build on existing work in such a way that a government could actually adopt the measures and begin to use them.

To further this process, consultations are being held at every stage with officials from Nova Scotia government departments particularly concerned with sectors of the new index, in order to keep them informed and address their concerns. The goal is to involve government from the start rather than to present a final product into which officials have had no input.

### 2. Components of the Nova Scotia Genuine Progress Index (GPI)

Although the Nova Scotia project has borrowed the GPI name from its U.S. originators, the methodologies are being drawn from a wide variety of sources and are not always identical with those used in the original U.S. study. A year-long literature review and wide-ranging consultations with Statistics Canada and other organizations and experts produced a selection of indicators, measures, methodologies and data sources grouped into 20 modules. These are described in a 135-page document entitled *Measuring Sustainable Development*, available on the GPI Atlantic web site.

The project is now proceeding on a sector-by-sector basis, postponing any effort to construct a comprehensive index of sustainable development until all modules are developed. After first drafts on each issue are prepared, an extensive review process is undertaken to gather feedback, suggestions and comments from Statistics Canada and other experts and from stakeholder groups. An advisory council is being created in each area to ensure that methodologies are sound and stakeholder interests addressed.

Since any index of progress must be based on a set of normative principles that define what constitutes progress, almost all modules in the Nova Scotia GPI refer to three fundamental sets of values. These are security (including physical safety, health and livelihood), equity (both intra-generational and inter-generational), and environmental quality (including natural resource stocks, material and energy flows, and environmental protection expenditures). Three modules also address higher human values, in this case freedom, community strength and educational attainment. A review of existing literature and extensive consultations with stakeholders have produced what we believe to be a reasonable consensus on the values, components and indicators of the Nova Scotia index.

The 20 components of the Nova Scotia GPI include four studies based on the use of time. The first two of these, on the economic value of **civic and voluntary work** and the economic value of **unpaid housework and child-care** have been completed and are available at this conference. They will be described in more detail below. The third will examine trends in overtime hours and the **costs of underemployment**, including the potential for job creation through the redistribution of hours. The fourth will aggregate total paid and unpaid work hours to arrive at a residual valuation for trends in **leisure time**. Statistics Canada's time use and labour force surveys provide the primary data sources for these modules.

The report on the **costs of crime** is almost complete in draft form. This study has aggregated direct victim costs, public expenditures on justice, and defensive expenditures on crime prevention to reach a conservative estimate on crime costs in the province. Additional data from victim surveys, from the insurance and retail industries, from court awards, and from specialized studies provide the basis for a more comprehensive estimate of crime costs including costs of unreported crimes, white-collar crime, business shrinkage due to employee theft, and victim suffering. Whereas the original U.S. GPI excluded most government expenditures a priori as defensive expenditures, the sectoral approach of the Nova Scotia project requires that public justice expenditures be specified in order to give as complete a portrait of crime costs as possible.

Work has also begun on the **income distribution** component of the Nova Scotia index. New provincial tabulations by Statistics Canada will form the basis for time series in the Nova Scotia GPI based on GINI coefficients after tax and transfers. Demographic analyses of those below the low-income cut-off will be included, as well as data on the dynamics of poverty and wealth in the province.

Work is currently underway on natural resource accounts for **soils and agriculture, forestry, and fisheries**. Efforts are being made to assess non-consumptive resource values as well as the sustainability of current harvesting quantities and methods. The forestry study, for example, draws on work assessing the carbon storage value of the province's forests as well as their value in protecting watersheds, soil quality, habitat and bio-diversity. The Canadian Council of Forestry Ministers' (CCFM) sustainable forestry criteria and indicators, which include all these values, form the framework for the Nova Scotia forestry accounts.

Wherever possible, links are being drawn to the long-term economic benefits and costs of alternative resource uses. The soils study, for example, draws on a model that calculates likely future losses of agricultural productivity resulting from current levels of erosion and soil degradation in the province, and the forestry study assesses the impact of recreational usage on the Nova Scotia tourism industry. Attempts are being made to assess the impact of different harvesting methods on soils, output quality and yields over time, as well as on employment and community stability.

A framework developed by Dr. Tony Charles of Saint Mary's University is being used for the fisheries accounts, as well as a model developed by the World Resources Institute (WRI) in Costa Rica assessing maximum economic returns in relation to fishing effort and sustainable yield estimates. Social factors such as employment characteristics and economic dependency ratios will be considered in the analysis along with resource use, ecosystem health and other environmental factors.

The integration of natural resource accounts into the balance sheets will have significant policy implications at both the provincial and household levels. Signals of unsustainable resource use will appear early enough for policy makers to take timely remedial action and to use financial tools such as taxation and subsidies to encourage changes in harvesting practices. If time permits in the presentation, the WRI model will be demonstrated to illustrate the policy relevance of these new accounting mechanisms.

Work has also begun on a set of **greenhouse gas accounts** for the province. These use Environment Canada studies for the provincial emissions data, and Statistics Canada's new *Econnections* data for a set of household-level accounts. The concluding section of this study will point to potential cost-effective emission reduction strategies based on existing studies. In particular, a full social benefit-cost model developed by the Australian Bureau of Communications and Transport Economics is being used to evaluate alternative emission reduction options in the transportation sector.

The first two preliminary reports for the **Sustainable Transportation** module of the project, on the full costs of commuting and on infrastructure deficit accounting, have been completed. The

commuting study uses vehicle ownership and operating costs derived from Canadian Automobile Association materials, travel time estimates from a model used by the British Columbia Ministry of Transportation, and commuting times from Statistics Canada's 1992 time use survey. Average commuting distances are computed from Statistics Canada's *Fuel Consumption Survey* and from Transport Canada estimates. Environmental and congestion costs as well as external accident and parking costs are drawn from the Victoria Transport Policy Institute's *Transportation Cost Analysis*, though these are currently being revised and refined by reference to additional sources.

The commuting study found that average user-paid commuting costs in Nova Scotia are about \$4,200 a year, of which more than half are vehicle ownership and operating expenses and one-third consist of travel time costs assessed at half the average hourly wage in the province. External costs, including environmental impacts, add another \$2,100 a year to the total. The Nova Scotia study found that a shift to telecommuting would yield substantial direct savings to government, business and households, with telecommuting costs averaging only one-quarter of auto commuting costs.

The second transportation report explored investment-based accounting for highways, using Transport Canada's *Special Infrastructure Project* and several American studies as its basis. The current expenditure system in effect "expenses" capital costs as if they were consumed in the same year as the expenditure, and cannot therefore accommodate assessments of past and future costs. The GPI Atlantic report demonstrates that the exclusion from current accounting procedures of infrastructure deficit assessments, generated traffic estimates, and an interest rate based on the opportunity cost of highway capital investments, has produced a significant underpricing of road facility costs.

A full-cost accounting approach to transportation inevitably raises questions about the degree to which users actually pay their own way. The Nova Scotia study explores European models, particularly from Great Britain and Sweden, in which roadway facility costs are assigned in proportion to use and damage through differential registration fees and weight-axle-distance taxes imposed on trucks. Over the next six months, other aspects of the sustainable transportation module will be developed, including an investigation of integrated land-use and transportation planning.

Conditional on funding, it is hoped that the first 11 components of the Nova Scotia GPI will be completed by May 1999 in time for a proposed inter-provincial conference scheduled for Halifax. At that time, it is hoped that working sessions will secure agreement on methodologies that can be adopted by jurisdictions across the country to allow for comparability. In preparation for that process, each module of the Nova Scotia GPI concludes with a section on methods and data sources, demonstrating how the Nova Scotia measures can be replicated by other provinces.

The remaining nine components of the index are scheduled for completion in the fall of 1999. These include an ecological footprint analysis of Nova Scotia consumption patterns, studies of air and water quality, natural resource accounts for non-renewable subsoil assets, the costs and services of consumer durables, a section on debt and external borrowing, a composite livelihood security index, and assessments of trends in health care and educational attainment.

Wherever possible, monetary values are being imputed in order to demonstrate linkages between the market and non-market sectors of the economy. GPI Atlantic has taken the view that monetary valuations are necessary as long as market statistics dominate the policy arena and send the primary cues for the actual behaviour of governments, businesses and individuals. Ultimately, money is an inadequate tool to measure non-market values, and the long-term goal is to move beyond the GPI itself to a form where time use and environmental quality variables are considered as inputs into policy decisions in their own right alongside market factors. Monetization in the Nova Scotia project should therefore be seen as a temporary expedient and means of communication with conventional economic structures.

At the beginning of the year 2000, data from the 20 components will be integrated to construct a comprehensive index of sustainable development for the province. Consideration of weighting procedures is being postponed until then. It is recognized that a “bottom line” index consisting of many different variables has limited policy relevance, since it cannot reveal which factors are making the index go up or down. However, the 20 separate modules are designed to fulfill that need, and it does seem helpful to draw on representative indicators from each module to assess whether, as a whole, the province is moving towards greater sustainability or not. Thus, a final genuine progress index will be created at the end, though it is not a primary goal of the Nova Scotia pilot project.

### **3. Statistics Canada Time Use Surveys and Replacement Cost Valuations**

In order to demonstrate the purposes and procedures of the Nova Scotia pilot project, sample data from the first two completed modules, on the economic value of voluntary work and unpaid household work, will be presented here. Principal methods will be discussed first, followed by a summary of some major results and a brief discussion of attendant policy implications. Copies of the full reports are available to conference participants.

Both modules use the time use survey from Statistics Canada’s 1992 General Social Survey to estimate hours of unpaid work. Results from the 1998 GSS time use survey will be available next year, and we have recommended that scaled-down annual time use surveys be conducted to allow these modules to be updated regularly.

The time diary method used in these surveys yields more accurate data than questionnaires and eliminates the possibility of double-counting by recording only the primary activity performed at any given time. Provincial tables are available in Statistics Canada’s *Initial Data Release from the 1992 General Social Survey on Time Use* (catalogue no. 11-612, #30).

The GSS time use survey also has the advantage of measuring both the contribution of volunteers in formal organizations as well as informal voluntary work not performed through any organization. The latter, which includes visiting the sick, elderly and disabled and other forms of direct personal care to those outside one’s own household, amounts to about twice the hours of formal volunteer work.

Statistics Canada's *Households' Unpaid Work: Measurement and Valuation* (catalogue 13-603E, #3, December 1995) gives replacement cost rates for each category of unpaid work activity by province. For the valuation of voluntary work, the replacement cost (specialist) method is used in order to obtain values for the market professions most comparable to the actual activities performed by volunteers. In Nova Scotia this rate was calculated at \$13.02 an hour, adjusted to 1997 dollars, close to the \$13.15 average hourly wage paid to workers in the health and social services industries, but well below the \$17.22 an hour replacement cost rate for voluntary work in Ontario.

The household work valuation uses the replacement cost (generalist) method based on the \$9.20 an hour paid to domestic workers and \$7.58 an hour paid to child-care workers in the province. However both modules also compare the methods chosen to results obtained by using alternative methods. The voluntary work report also assesses the results of using the specialist method for formal voluntary work and the generalist method for informal voluntary activity. The study of household work also compares the replacement cost valuations with before and after tax opportunity cost valuations.

It should be noted that current assessments of unpaid work are based on the value of labour inputs only. The most accurate measurements, at least for comparability with market values, would be output valuations. Promising work is under way by Dr. Andrew Harvey and the United Nations Institute for Research and Training for the Advancement of Women in furthering output analyses that will produce more comprehensive measures of unpaid work. In the meantime, the Nova Scotia study does attempt assessments of the value of capital inputs into household work, based on experimental work at Statistics Canada and estimates by Duncan Ironmonger in Australia.

#### **4. The Economic Value of Voluntary and Household Work**

The assessment methods described above indicated that Nova Scotians contribute 134 million hours a year of their time to civic and voluntary work, helping those in need, caring for their environment, and contributing to society and local communities. Their work is worth \$1.9 billion a year to the economy, the equivalent of 81,000 jobs and nearly 10% of annual GDP. Though this vital work is not currently reported in any of the conventional economic accounts, its disappearance would mean a dramatic decline in the standard of living unless it were replaced for pay by government and the private sector.

In addition to labour inputs, Nova Scotians contributed about \$128 million in non-reimbursed out-of-pocket expenses to perform their voluntary work, based on estimates in Statistics Canada's National Survey on Volunteer Activity. Volunteer organizations also contribute to the formal economy indirectly by providing valuable skills training to volunteers in areas such as organizations and management, communications, fundraising, office and technical skills, and specialized knowledge of direct use to paid jobs.

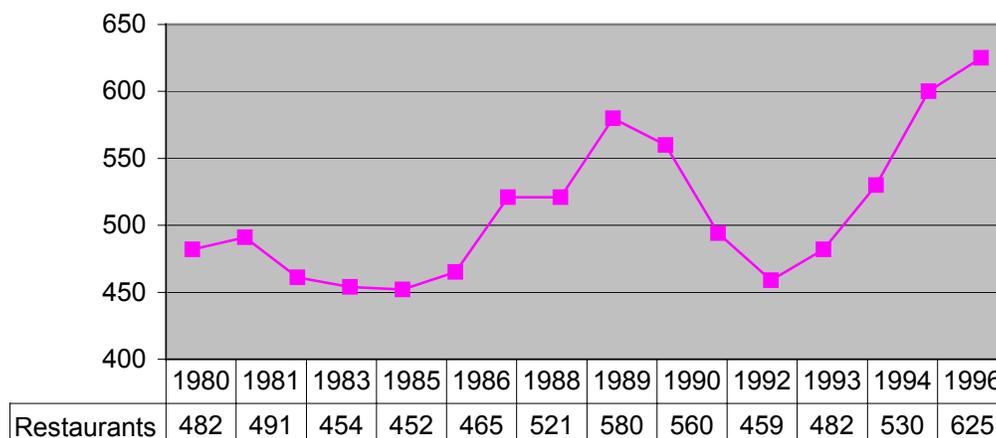
Household work was worth \$8.5 billion a year to the economy, equivalent to 51% of GDP at factor cost. If unpaid work were included, the three largest sectors of the provincial economy

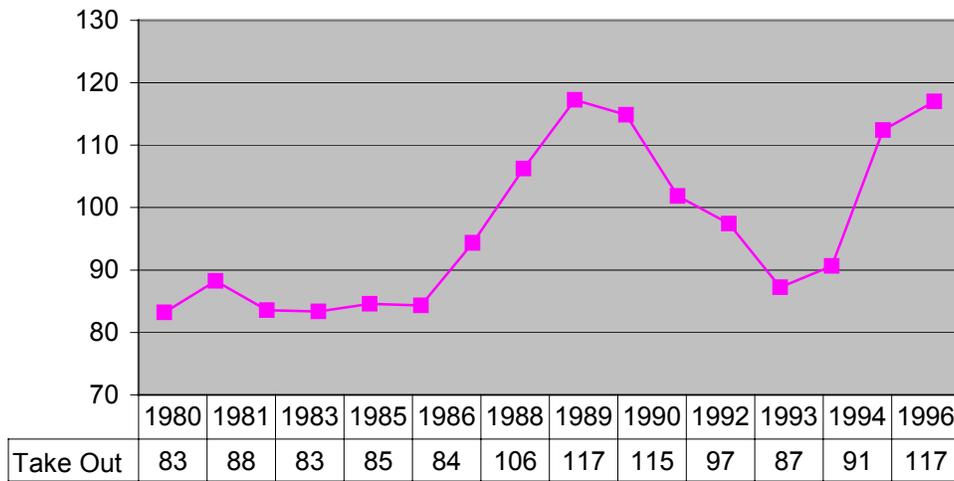
would be household food services, housecleaning and laundry, and servicing household production through shopping for goods and services. This household work is not only essential to basic quality of life and standard of living, but is also a necessary precondition for a healthy market economy.

Failure to measure household work actually leads to inaccurate assessments of GDP growth rates, since shifts from the household to the market economy will show up as absolute growth even though total production may not substantially increase. Similarly, in times of recession, the household economy may cushion the effects of a market downturn more effectively than the decline in GDP growth rates indicates. The hypothesized “counter-cyclical” relationship between the household and market economies can currently be better demonstrated by trends in food services than in child-care (see charts 1 and 2), and more work needs to be done to assess the degree of bias in GDP growth estimates.

Because the consumer price index for services like food preparation and child-care has risen faster than the overall consumer price index and disposable incomes of Canadians, the Nova Scotia study found that Canadians are paying more for shifts from the household to the market economy than their incomes appear to allow, contributing to rising consumer debt levels. Using Statistics Canada’s *Household Facilities* and *Family Expenditure* surveys, the Nova Scotia study also found that increased levels of household capital equipment and “labour-saving” devices have not actually saved overall housework time, which has remained at relatively constant levels for more than 40 years (Chart 3). Declining household size appears to have rendered the household economy increasingly inefficient.

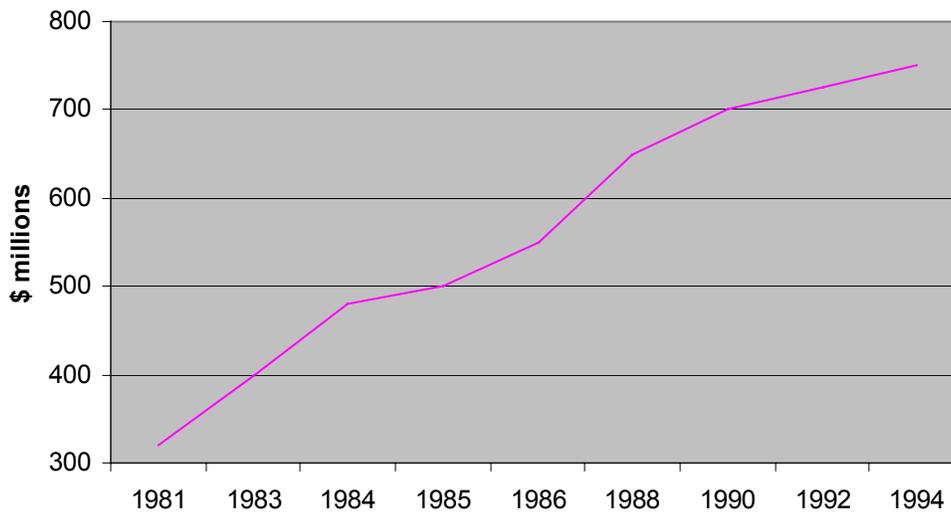
**Chart 1: Restaurant and Take-Out Receipts, Nova Scotia, (1996\$ millions) appeared to respond sensitively to the recession of the early 1990s.**





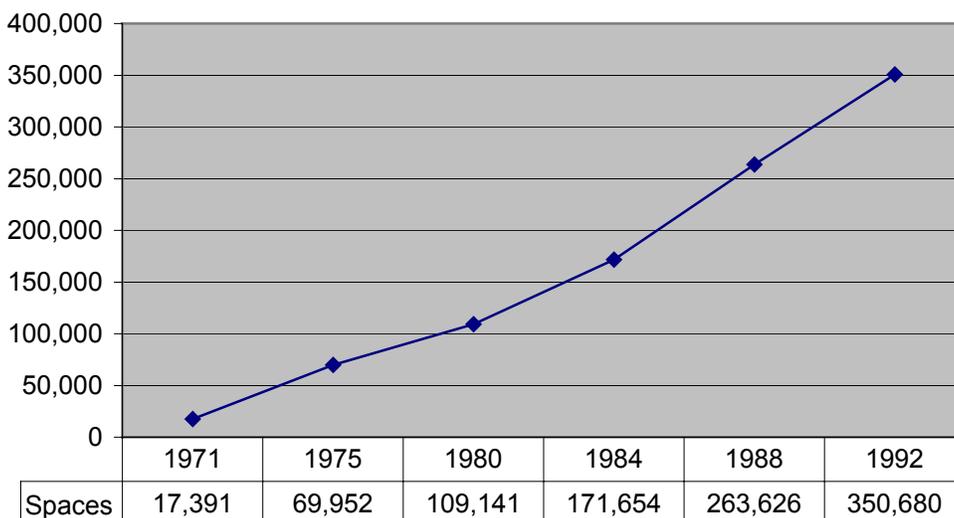
Sources: Statistics Canada, *Restaurants, Caterers, Taverns Receipts*, no. M52, Nova Scotia, annual reports, adjusted to constant 1996\$, using the Nova Scotia Consumer Price Index for “Food Purchased from Restaurants”, Statistics Canada, CANSIM database 7466, P 803032.

**Chart 2: While Canadian Child-Care Trends Seem Impervious to the Business Cycle, Child-Care is the Fourth Fastest Growing Industry in Canada**



Source: Statistics Canada, *Canadian Economic Observer*, February 1995, catalogue 11-010.

Licensed Day Care Spaces in Canada, 1971-1992



Source: Statistics Canada, *Women in Canada*, 3<sup>rd</sup> ed., catalogue no. 89-503E, from Health and Welfare Canada, *Status of Day Care in Canada*.

### 5. Policy Implications I: Trends in Voluntary Work

The gross figures alone conceal the vital policy implications of valuing unpaid work. The Nova Scotia study is therefore attempting to place the results and valuations in an explicit policy context in order to focus attention directly on the importance of emerging trends for the Canadian standard of living and quality of life. This will hopefully increase the scope of public debate and discussion on issues that, because they have been unmeasured, have received insufficient attention in the policy arena.

Finance Minister Paul Martin has remarked:

*There is no question that governments have to rely on volunteerism more than ever in a time of cut-backs<sup>1</sup>.*

But without measuring voluntary work there has been no way to assess whether volunteer and community-based agencies have in fact successfully compensated for government service cuts. The recent release of results from Statistics Canada's 1997 national survey of volunteers indicates for the first time that volunteer hours per capita have in fact dropped by 4.7% nationwide since 1987 and by 7% in Nova Scotia. Though more Canadians than ever are volunteering, they are contributing less hours than before.

<sup>1</sup> *Maclean's*, July 1, 1996, page 41.

Using Statistics Canada's volunteer surveys, the Nova Scotia pilot study found that university graduates and married women have particularly high rates of participation in volunteer organizations. However university graduates also have by far the highest rates of overtime participation in the market economy, and married women register the highest rates of time stress in Statistics Canada surveys as they juggle home and work responsibilities. Thus, the very groups on which volunteer organizations most rely are being increasingly time-squeezed by market trends, helping to explain declining volunteer hours.

The decline in voluntary services in fact parallels government service cuts, leading to a cumulative welfare loss rather than the hoped for compensatory effect. Since volunteers provide vital services needed to maintain Canada's standard of living, adequate financial support for volunteer organizations would appear to be a cost-effective investment. Regularly measuring voluntary work hours will allow timely policy responses to such emerging trends, which would otherwise remain invisible until they showed up in an actual deterioration in the country's quality of life.

In addition to the quantity of hours, the nature of voluntary work is also changing. Between 1987 and 1997, youth volunteer participation rates increased by 15 percentage points, compared to only 4.6 percentage points for the population as a whole, reflecting high youth unemployment rates. While an overwhelming proportion of volunteers in the 1987 survey indicated that their main reason for volunteering was to help others, 54% of youth in the 1997 responded that their motivation was to improve their job opportunities. Only 21% of 25-44-year-olds and 11% of 45-64-year-olds gave that answer.

The Nova Scotia report recommends that a question similar to that used in Statistics Canada's *Labour Force Survey* to assess involuntary part-time work be included in future time use surveys to assess trends in "involuntary voluntary work". The question might simply ask whether voluntary work was undertaken because paid work was unavailable. If voluntary work hours are to be included in a comprehensive index of social progress, such "involuntary" hours should probably be subtracted from the overall valuation, since an increase in paid hours would likely constitute a more acceptable trend for those who would prefer paid employment.

## **6. Policy Implications II: Trends in Women's Work**

While women have doubled their rate of participation in the paid labour force in the last 40 years, their share of unpaid housework has hardly changed (Chart 3). Compared with men, women spend about twice as much time on total unpaid household work, three times as long cooking and washing dishes, and nearly seven times as much time cleaning house and doing laundry. While the breaking down of gender barriers in the market economy is widely seen as a sign of women's growing freedom, their continuing high share of household work has produced an actual decline in women's free time.

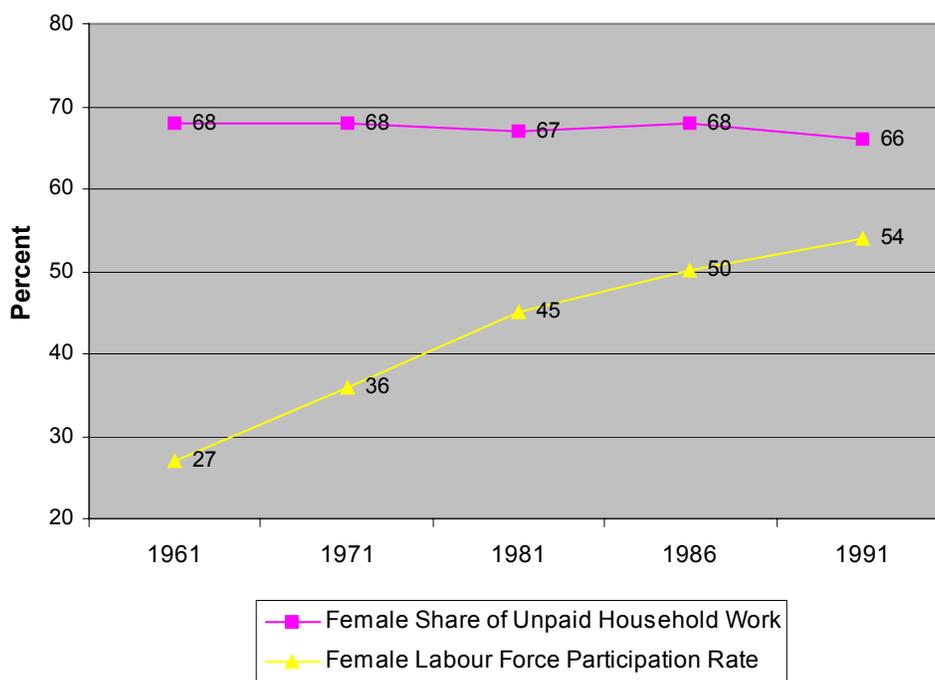
Workplace arrangements still reflect the reality of an earlier era in which there was one main earner and one full-time homemaker. Measuring unpaid household work can therefore stimulate consideration of flexible work arrangements, including job sharing, flexible hours and working

from home, that better allow employees to balance their household and employment responsibilities and reduce the high levels of time stress that currently prevail.

The measurement and valuation of unpaid household work also has implications for pay equity issues. Work that is similar to that done in the home and traditionally regarded as “free”, such as domestic services and child-care, also brings particularly low wages in the market economy. This market work is still overwhelmingly performed by women, contributing to the low ratio of female to male wages (66 cents to the dollar in Nova Scotia). Average child-care wages in the province are only \$7.58 an hour, and part-time domestic services are actually excluded from minimum wage requirements under the Labour Standards Code.

Measuring and valuing unpaid household work is also critical in creating the shift of view necessary to end child poverty in Canada, a unanimous goal of the House of Commons in 1989 that has not yet produced results. High rates of child poverty are directly linked to high poverty rates for single mothers. Children of single mothers are 14% of all children in Canada, but 42% of all children in low-income families. 70% of single mothers in Nova Scotia live below Statistics Canada’s low-income cut-off.

**Chart 3: Women’s Share of Household Work in Nova Scotia Has Remained Almost Unchanged Despite Dramatic Increases in Paid Work**



Sources: Statistics Canada, *Households’ Unpaid Work*; Statistics Canada, *Historical Labour Force Survey*; Statistics Canada, *CANSIM* database; Historical extrapolations, 1961-1975, from Statistics Canada, *Charting Canadian Incomes: 1951-1981*, catalogue no. 13-581E, pages 10-11; Statistics Canada, *Women in Canada*, 3<sup>rd</sup> edition, catalogue no. 89-503E, page 88; Statistics Canada, *Women in the Workplace*, 2<sup>nd</sup> edition, catalogue no. 71-543E, page 10.

Statistics Canada's time use surveys indicate that single mothers put in an average of 50 hours a week of productive household work that can be seen as a direct investment in the country's human capital. In fact, paid work is not an option for many single mothers. Those that are employed pay three times the portion of their income on child-care as married mothers and have less than half the primary child-care time with their children as their non-employed counterparts. Because so many single mothers are dependent on the invisible household economy, their needs are accorded low policy priority.

Once unpaid household work is measured and valued, subsidized child-care and other social supports can be seen as essential social infrastructure for the household economy rather than as a "welfare burden," just as taxpayer's money is currently used to support business investment and job creation in the market economy. Since poverty is directly correlated with poor health, premature death and low educational attainment, raising the policy profile of single mothers and children in poverty can be a good investment that will reduce high social costs in the future. The key issue in stimulating such a policy shift is to see the household not merely as a unit of consumption, as conventional economic theory does, but as unit of economic production.

In these and other ways, the measurement of unpaid work raises critical policy issues that have a direct impact on Canada's standard of living and quality of life. For this reason, the Nova Scotia pilot project is concentrating on a detailed break-down of each component of the proposed index of sustainable development, so that the new measures may become as practical, usable and policy-relevant as possible.

## **7. Challenges in Correlating Quantitative Trends with Assessments of Progress**

Conference participants are well aware of the many complex challenges facing the construction of comprehensive indices of social progress. These include the specification of a set of consensus values that define what constitutes progress, the difficulties of assigning economic values to services not exchanged for money in the market economy, and the determination of appropriate discount rates in long-term assessments of sustainable resource use. Time does not permit a discussion of all these issues here.

We therefore wish to raise just one such challenge here that has so far produced apparent contradictions in expanded measures of well-being, which has faced our own work in Nova Scotia, and on which we would welcome discussion and input.

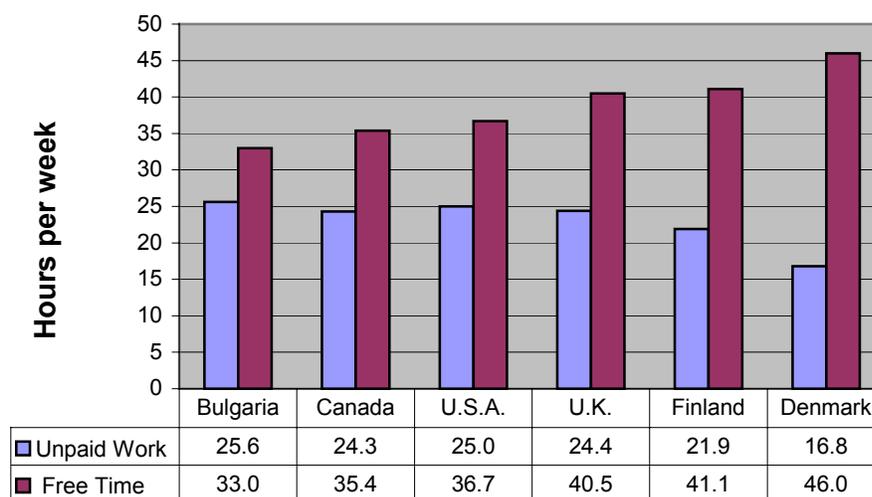
Our dissatisfaction with GDP growth rates as a proxy measure of societal prosperity and progress rests in part on Simon Kuznets' explicit recognition that a nation's welfare cannot be determined by quantitative growth alone but depends on qualitative distinctions concerning the nature and purpose of different types of growth. We recognize, for example, that growth in crime, accidents, toxic pollution and greenhouse gas emissions are not acceptable indicators of progress, though these activities currently contribute to GDP growth. Some types of growth are clearly regrettable, and we fault the inability of current conventional measures to distinguish between casinos and clinics, schools and prisons, in assessing economic well-being and social progress.

However, it seems we must be careful not to fall into the same trap that “more” is necessarily “better”, as we begin to measure areas of the economy that have hitherto escaped attention. In our work on household production, for example, it became clear that a reduction in weekly housework hours might signify progress more accurately than simply adding the total value of unpaid labour inputs into an expanded growth index. International comparisons reveal that Danes do about eight hours a week less household work than Canadians and have 11 hours more free time (Chart 4).

Inefficient modes of household production and living arrangements may be partly responsible for the high rates of time stress that have resulted from juggling paid work pressures, including trends towards more overtime, with long household hours that have not diminished over time. Movement towards the Danish model, with its shorter housework hours, might reduce these pressures and stresses. More efficient resource use, by sharing household capital for example, might result in improved housework outputs with less labour and capital inputs.

In short, measuring and valuing unpaid household work does not imply that the resultant value can be uncritically added to a comprehensive index of well-being or that a higher value is a sign of progress. So far we have discovered no short-cuts or solutions to this dilemma beyond recognizing that a close analysis of the specific data sets within each sector is required to assess which particular indicators and trends constitute real progress. The gradual development of output measures for unpaid work will assist this process greatly, but it is likely to remain a paradox while valuations depend on input measures.

**Chart 4: Average Weekly Hours, Unpaid Household Work and Free Time  
Population age 20-59, Selected Countries**



Source: Harvey, Andrew, “Canadian Time Use in a Cross-National Perspective”, *Statistics in Transition*, November, 1995, volume 2, no. 4, pages 595-610. See Table 3, page 603.

The earlier discussion of the growth of “involuntary voluntary work” among young people unable to find paid employment raises similar challenges, in that “more” voluntary work is not necessarily a sign of progress.

The challenge becomes even more acute when resource consumption is considered. The original Genuine Progress Indicator, for example, begins from a base of personal consumption in which higher values raise the index. But the Nova Scotia index includes an ecological footprint analysis based on the work of William Rees and Mathis Wackernagel at the University of British Columbia. According to that model, if the world’s population were to consume resources at the current Canadian level, we would require two extra planets earth to provide the necessary energy and materials. From that perspective, higher levels of consumption may constitute a less accurate measure of progress than more efficient use and equitable distribution of existing resources.

The Nova Scotia household work analysis similarly found that higher levels of spending on household capital and appliances did not produce a commensurate gain in free time. In fact, at a time of declining real incomes, this spending has likely raised consumer debt levels. In sum, we do not offer a simplistic or blanket solution to this dilemma, beyond a warning that expanded indices of well-being may produce serious internal contradictions if new quantitative measures, however important, are automatically taken as indicators of progress.

The challenges facing the new measures are certainly no reason to backtrack or to rely on the overly simplistic and misleading indicators of progress on which our society has relied to date. The Nova Scotia pilot project and all new indices should be subject to constant revision and improvement as better methodologies and new data sources become available. The new measures should never become a rigid final product but are themselves a continuous work in progress designed to elucidate ever more accurately the complex social, economic and environmental linkages that constitute reality.