GPI Atlantic
Genuine Progress Index for Atlantic Canada/Indice de Progrès Réal

MEASURING SUSTAINABLE DEVELOPMENT

APPLICATION OF THE GENUINE PROGRESS INDEX TO NOVA SCOTIA

THE GPI NOVA SCOTIA NATURAL RESOURCE & ENVIRONMENTAL ACCOUNTS

BRIEF FOR SDI STEERING COMMITTEE

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A. Conceptual Basis

1. Background: The International Context

It has long been recognized that standard economic growth measures send inaccurate and misleading signals to policy-makers concerning natural resource health and environmental quality. Because they count only the value of harvested resources, conventional market statistics like GDP growth rates (a) ignore the non-market values of natural capital assets and the ecosystem services they provide, and (b) effectively count natural resource depletion as a contribution to economic prosperity.

Further, because the economic growth statistics make no distinction between economic activities that create net benefit and those that result from and compensate for a decline in well-being, pollution cleanup expenditures are effectively counted as a contribution to economic prosperity rather than as a cost to the economy.

In order to remedy these shortcomings, the United Nations, World Bank, International Monetary Fund, OECD, and Commission of the European Communities in 1993 jointly issued revisions to *The System of National Accounts*, prescribing for the first time that natural resources be incorporated into government balance sheet accounts.

These internationally accepted guidelines also recommended the development of a "satellite system for integrated environmental and economic accounting", to make explicit environmental protection expenditures, to link resource use and waste production to economic data, and to account for natural resource depletion and environmental degradation.

In accord with this goal, the World Bank in 1997 published *Expanding the Measure of Wealth: Indicators of Environmentally Sustainable Development*, and Statistics Canada released its new *Canadian System of Environmental and Resource Accounts*, which will be incorporated into the country's national balance sheets and input-output accounts. One stated goal of Statistics Canada's new Environmental Protection Expenditure Accounts is "to provide those who might be interested in calculating an environmentally-adjusted GDP...with the information necessary to do so." *(Note: Footnotes not included in this brief.)*

There is now a significant global movement to incorporate critical social and environmental information in new sets of expanded accounts. Norway, Finland, Germany, Australia, Denmark, The Netherlands, Sweden and France are among the countries that have taken the lead in this effort. As a result of these international initiatives, and the work of international non-governmental organizations like the World Resources Institute, there are now excellent models and methodologies available, and a sound basis for international comparability.

2. Basic Principles

The Nova Scotia GPI work draws on a wide range of these models and valuation methods and identifies four core principles as the basis for its practices:

1) Sustainability as an integrating theme;
2) An investment-oriented accounting approach that recognizes natural resources as capital assets subject to depreciation and requiring potential re-investment;
3) Application of the precautionary principle to economic valuation methods;
4) Recognition of resource accounting and sustainability measures as a first step towards incorporating "full-cost accounting" procedures into existing financial and taxation structures, and eventually into market price mechanisms.

2.1. Sustainability as an Integrating Theme

The integrating theme of the new methods of accounting is the view of "sustainability". In contrast to the short-term changes in *quantitative* growth tracked by the GDP, sustainable development measures have a long-term *qualitative* perspective that acknowledges (a) the dependence of the human economic subsystem on an encompassing ecosystem, and (b) present responsibility to protect vital ecosystem services for the benefit of future generations.

In addition the Brundtland Commission recognized that ecosystem health and sustainable development depend on "changes in access to resources and in the distribution of costs and benefits":

> *Even the narrow notion of physical sustainability implies a concern for social equity between generations, a concern that must logically be extended to equity within each generation.*

Statistics Canada notes that, from this definition, "a consensus has emerged that sustainable development refers at once to economic, social and environmental needs":

> *A clear social objective that falls out of the definition (of sustainable development) is that of equity, both among members of the present generation and between the present and future generations....It is clear that the spirit of sustainable development implies that all people have the right to a healthy, productive environment and the economic and social benefits that come with it.*

Perhaps the greatest challenge of this view to the traditional economic thinking which the GDP reflects is its recognition that progress and well-being may well depend on limits to growth rather than continued economic expansion. Presenting its new Natural Resource Stock Accounts, Statistics Canada noted (Cat. no. 16-505-GPE):

> *Canadians now recognize that their natural resource base is finite and that it must be managed for the benefit of both current and future generations. This recognition is translating more and more often into economic policy that looks*

> *beyond the conventional orientation of economic growth, setting instead targets for sustainable development.*

Thus, sustainability has both ecological dimensions, — the necessity to live within the carrying capacity of our natural resource base and waste assimilation capabilities --, and social components concerned with equity, potential limits to growth, the balance between increased output and the value of leisure, and the valuation of human as well as natural capital. Sustainability recognizes that social stresses may threaten ecological health and undermine future prosperity.

It is argued that the measurement of sustainable development has a strong basis in economic theory (Hicksian income), in science (the recognition of ecological life support services, of finite carrying capacity and maximum sustainable yields in resource exploitation), and in ethics (inter- and intragenerational equity). Increasingly, it also has a legal basis both in domestic legislation setting targets, standards and thresholds for environmental protection and waste reduction, and in Canada's international commitments.

For example, Agenda 21, the concluding document of the United Nations Conference on Environment and Development in Rio de Janeiro in 1992, called on all 178 signatory countries to expand their national statistical accounts to include both environmental factors and unpaid work.

The goal of sustainable development has also increasingly been integrated into the structure of legislation and administration in Canada. From December 1997, each federal government department was required to submit a Sustainable Development Strategy to the Office of the Commissioner of the Environment and Sustainable Development in the Office of the Auditor General. These strategies require measures and indicators of sustainability, and make the new NRTEE initiative timely, necessary and practical.

2.2. An Investment-Oriented Approach to Natural Resource Accounting

In order to measure sustainable development, accounting systems must take an investment-oriented rather than consumption-driven view of economic activity. Instead of the 19th century division of productive factors into land, labour and capital, which still dominates much conventional economic analysis, the newer investment-guided accounts of sustainable development see *all* productive factors as capital —natural, human, produced, and social assets.

Natural capital includes resources and ecosystem functions; human capital includes the health and education of the labour force; man-made or produced capital includes plant, equipment and infrastructure; and social and cultural capital includes social institutions, community stability and political processes.

Though harder to measure in monetary terms than man-made capital, natural, human and social capital are equally subject to depreciation and require new investments if they are to provide a flow of services into the future. Thus the increasing importance of knowledge as a vital productive factor in an era of rapid technological change requires investments in human capital, such as staff training and skills upgrading.

Similarly, unlike earlier eras where natural resources appeared limitless, we have learned that excess depreciation and depletion of natural capital carries long-term economic costs, as occurred with the Atlantic ground-fishery. Instead, it is argued that sustainable development means living off the income (or "interest") generated by natural capital assets without depleting capital stocks. When natural resources and ecosystem functions are explicitly valued, maintained and protected in the interests of long-term prosperity, then restorative forestry, fish quotas, wetland restoration and similar actions are counted as investments in natural capital rather than simply as "costs."

2.3. Valuation Methods and the Precautionary Principle

Money is universally acknowledged as a poor tool to value natural capital functions, resource depletion costs, and restorative investments. Nevertheless, in an era when budgetary considerations dominate the policy agenda, economic valuations are regarded as an essential, if imperfect, communications tool to bring natural capital values into the policy arena.

Monetary valuations of ecosystem functions are problematic. Replacement cost valuations can assess the cost of replacing lost ecosystem functions with human engineering solutions, but these methods have been criticized for assuming the substitutability of manufactured for natural capital. Pollution cleanup costs and environmental restoration expenditures are "defensive expenditures" that compensate for past damage rather than producing a net improvement in well-being. But these costs are also investments in future environmental quality. While some analysts count higher levels of defensive expenditures negatively as loss of value reflecting greater environmental degradation, others see them positively as indicative of greater government commitment to environmental restoration. Contingent valuation methods are even more controversial.

Because monetary valuations are imperfect, all Nova Scotia GPI economic valuations are based on physical accounts. In an ideal world, these physical valuations would be taken into account in all policy decisions in their own right. In reality, however, current treatment of these values as "externalities" that are frequently sidelined in the policy process necessitates their translation into economic values and their incorporation into the main-frame economic accounts as a temporary strategy rather than an ultimate goal.

Whatever disagreements there may be about alternative valuation methods, there is widespread agreement that the basic purpose of natural capital valuations is to reflect the actual dependence of human economic survival on ecosystem health. Wherever resource

depreciation may produce irreversible damage to the human economy, economic valuations must be sufficiently high to demonstrate that reality and encourage conservation actions. Though the Nova Scotia GPI resource accounts generally present a range of values, higher-end values are regarded as more reflective of the application of this "precautionary principle" which holds that scientific uncertainty must not be a reason for policy inaction where there is a potential for serious or irreversible damage.

Valuing natural capital assets in accord with the precautionary principle is similar to the insurance practice of setting current premiums sufficiently high to reflect both empirical evidence and the estimation of likely future benefits and costs. In common with prudent investment and long-term development strategies, sustainable development accounting systems incorporate uncertainty by setting higher "premiums" in direct relation to higher perceived risk. Economic valuations of the potential damage costs of greenhouse gas emissions and water resource depletion, for example, must be high enough to convey the magnitude of the high potential risks described by scientists.

2.4. Step Towards Full-Cost Accounting

Since businesses and individuals take their signals from the system of financial incentives and penalties, the vital link in moving society as a whole towards sustainable development in actual practice is an economic accounting system that incorporates environmental and social benefits and costs. That in turn is the fundamental basis for taxation systems, subsidies, pricing structures and other policy tools capable of encouraging actions that will ensure long-term prosperity.

A report on Maritime woodlots by the National Round Table on the Environment and the Economy noted that the current structure of taxes and subsidies actually encourages woodlot owners in the Maritimes to harvest unsustainably, with potentially serious consequences to the forest industry in the region. To the degree that social and environmental impacts are not included, the market economy will actually function inefficiently, since there are no built-in incentives to reduce energy and transportation costs, social expenditures, or pollution clean-up costs. Instead, these costs are often borne by the taxpayer, sometimes generations later.

“Polluter pay” principles, that have become increasingly accepted in many countries, are an important step towards full cost accounting that encourages production efficiency and reduces the clean-up cost burden on future generations. From that perspective, full cost accounting is an essential investment in the future. The Nova Scotia Environment Act, Part One, section 2 (c), for example, affirms “the polluter-pay principle, confirming the responsibility of anyone who creates an adverse effect on the environment to take remedial action and pay for the costs of that action.”

There are three stages in the implementation of full cost accounting. The first step, which the Nova Scotia GPI hopes to accomplish in that province, is the incorporation of social

and environmental benefits and costs into the central accounting system and measures of progress.

The second step, which will follow naturally, is the translation of these benefits and costs into the taxation and financial structures, so that beneficial activities are rewarded and harmful ones discouraged. An example is the gradual shift, in some European countries like Denmark, from payroll taxes (which dampen useful economic activity) to pollution, carbon and other "green" taxes, which penalize activity that produces long-term costs. A set of forest accounts, for example, should produce changes in the tax structure to reward sustainable harvesting practices and penalize unsustainable ones.

The final step, still in the future, is the reflection of social and environmental benefits and costs in the actual market price structure, so that the consumer actually pays the true cost of the products purchased. That will only finally occur when external costs are internalized; when fixed costs become variable and dependent on energy and resource use as well as waste production; and when non-market values are fully recognized in the market economy. Full-cost accounting will not only increase market efficiency by encouraging producers to reduce energy and other costs, but also decrease the burden on taxpayers and the need for external regulation of the market.

This longer-term perspective is important in order to understand that natural resource and integrated environmental-economic accounts are not goals in themselves, but simply a first essential step towards the much longer-term goal of changing market mechanisms and pricing structures themselves to reflect full environmental and social values and costs.

3. The Role of Natural Resource Accounts

The four principles outlined above are the theoretical base for the Nova Scotia GPI natural resource accounts. These principles are well grounded in the literature on resource accounting and have given rise to well established methods for valuing the non-market functions of natural capital assets.

The Nova Scotia Genuine Progress Index does not come up with its own methods, but draws on the best existing methods and established data sources to create a practical, integrated, and policy-relevant application of these measures in one particular jurisdiction. The goal of the Nova Scotia GPI is, therefore, not to come up with a new measure, but to integrate existing measuring tools developed by other researchers, national statistical agencies, and international organizations into the policy structure and apparatus of Nova Scotia, as a practical aid to policy-makers.

By measuring stock increases and declines, as well as qualitative changes like shifts in age and species structure, natural resource accounts can send early warning signals to policy makers of impending resource degradation and depletion. Unlike reliance on

economic growth statistics that misleadingly count a decline in natural wealth as income growth, natural resource accounts encourage re-investment in natural capital assets that will show up in the ledgers as an appreciation of asset value. Rather than being surprised by a sudden resource collapse, as occurred with the Atlantic ground-fishery, resource accounts allow policy makers to respond to stock depletion in a timely and graduated way.

In addition, natural resource accounts explicitly record conservation efforts by registering and counting the maintenance or enhancement of stock values, the reduction in unwanted flows (like greenhouse gas emissions), the diversion of waste from landfills, and other policy actions that currently have no value in our conventional economic accounts. In short, accounts that track natural resource health encourage the consideration of environmental impacts and resource use in all policy decisions.

In consultation with Statistics Canada analysts, GPI Atlantic has decided to develop the renewable natural resource accounts for forest, soils, fisheries, water, air and non-renewables one component at a time as stand-alone accounts, rather than to seek an aggregate "bottom line" single number as an alternative to the GDP. This approach avoids double-counting and complex weighting problems, and it provides policy makers with the detailed information they need in each area for policy purposes.

It also recognizes that sustainable development issues are more complex than the simplistic reliance on a single set of numbers like the GDP, and it seeks to elucidate the complex interactions among a wide range of indicators. The Nova Scotia GPI does not seek to replace the GDP, which will always be needed to assess the total quantity of production and consumption. It *does* seek to replace the *misuse* of the GDP as a measure of well-being and progress by providing a more accurate and comprehensive measure of sustainable development that accounts for the health of our natural and social capital.

At the same time, GPI Atlantic acknowledges that its methods, results and presentation are very much a "work-in-progress" rather than a rigid final product. Succeeding updates of the GPI natural resource accounts should strive to improve calculation methods, to use new data sources as they become available, and to add further indicators over time. Because they recognize economic valuation as a temporary strategy rather than a goal in itself, the GPI resource accounts should also encourage greater policy reliance on the physical indicators over time.

4. Challenges and Lessons Learned to Date

4.1 Data Issues

The good news is that 30 years of state-of-the-environment data collection and reporting in Canada have now produced a body of data that, for the first time, enable assembly of

significant time series to assess progress in the health of our natural resources. In short, it is possible both to produce meaningful natural resource and environmental accounts at this time in history and to assess changes over time. At the same time, there are still major data gaps; and one of the primary functions of natural resource and environmental accounting is precisely to identify these data gaps and to make recommendations for future systematic data collection.

GPI Atlantic researchers have consistently found that there are no short-cuts, and that construction of resource and environmental accounts is a complex and time-consuming process. Data are not conveniently located and assembled in one place. For example, data for the GPI Water Quality Accounts were drawn from materials held by Environment Canada, Department of Fisheries and Oceans, Statistics Canada, the provincial Departments of Environment, Natural Resources, Transportation, and Agriculture, various municipalities and water commissions, the archives of various non-governmental organizations like the Atlantic Salmon Federation, and a wide range of other sources. Very often, the data are in raw form and have not been analyzed or publicly released. Close cooperation with government officials is necessary for much critical data access.

4.2 Indicator Linkages and Assessment of Non-Market Resource Values

The researchers have also found that accurate reporting for each set of resource accounts requires assessment of ecological, social and economic sustainability, and the interaction among a wide range of indicators. Farm economic viability, for example, will determine the capacity of farmers to practice sustainable agriculture and protect soil quality. Alternative forest harvesting methods will have differential impacts on employment, and are themselves influenced by market prices determined by global economic realities. Fleet capacity and economic concentration in the fishing sector impact fish harvesting methods that in turn affect ecological sustainability.

An essential step in assessing these linkages and estimating the economic value of non-market resource functions and ecosystem services is study of the scientific literature. For example, to assess the economic value of species diversity in Canadian forests, one necessary step was the study of comparative rates of defoliation during spruce bud-worm infestations in mixed hardwood-softwood forests compared to single species softwood plantations. To assess the value of forest age structure in preventing soil erosion and thus safeguarding future forest productivity, it was necessary to examine the scientific literature on comparative rates of runoff and soil erosion in different forest structures, and the role of canopy height in intercepting rain.

To illustrate the fact that there are no short-cuts, one GPI Atlantic researcher actually produced a full set of forest accounts more than a year ago that was discarded because key assumptions were found to be misleading. Standard assessments of forest sustainability based on existing government and industry accounts compare "depletions" due to harvesting, fire, insects and disease with "regeneration" due to natural growth and

planting (silviculture). If the latter exceed the former, forest practices are conventionally judged to be "sustainable." But these standard quantitative tables allow a multi-aged multi-species old-growth forest to be replaced by a single-age single-species plantation. To assess forest sustainability more accurately, GPI researchers went back to the drawing board to explore changes in age and species diversity in Nova Scotia forests over time.

A further layer of complexity is in the interaction among the different resources themselves, and among local, national and global forces. For example, acid rain impacts on Nova Scotia lakes and rivers result largely from atmospheric emissions in Ontario and the northeast United States, so that local damage assessments cannot be automatically linked to local policy initiatives. One D.F.O. study found that forest herbicide use was implicated in salmon spawning patterns and population declines in several New Brunswick rivers, thus requiring linkages between forest and water accounts. Another D.F.O. study, at Carnation Creek, examined the impact of forest harvesting practices on sedimentation, watershed protection and freshwater fish stocks.

In short, the vital information about resource health is in the details, and in the understanding of linkages and connections among a wide range of indicators. The initial construction of resource accounts that value non-market ecosystem functions is laborious. The good news, however, is that once critical linkages and representative indicators have been identified, future updates of these accounts to assess progress over time will be much simpler and more straightforward.

4.3 An important limitation of natural resource accounts

Beyond these layers of complexity, there is a further danger in assessing sustainable development through the use of natural resource accounts alone. In isolation, natural resource accounts imply that the burden of sustainable resource use and movement towards greater sustainability depends on changes in harvesting practices by producers. But consumption patterns and global economic forces directly impact local and national efforts to improve resource sustainability. If the lowest price is the primary factor determining consumption patterns, efforts to improve sustainable resource use will be hampered by the inability of the market to reflect the "true price" of resource-based products.

It can cost a Nova Scotia farmer more to grow a lettuce than the price charged for a California lettuce at the supermarket checkout counter. Thus, consumption patterns at home may well be producing resource depletion and encouraging unsustainable harvesting practices abroad. An important challenge in sustainable development indicator work, therefore, is to ensure that all responsibility for future sustainability does not rest on the shoulders of producers alone, but is borne equally by consumers. In the GPI environmental accounts, this balance is sought in the inclusion of an ecological footprint analysis assessing the impact of consumption patterns on resource use.

4.4 Basic Conclusions

This list of challenges is far from exhaustive, and simply illustrates the complexity and limitations of natural resource accounting. Our basic conclusions after four years of work in the area are:

a) that it can be done, provided no claim is made to a "final" product and continuous openness is maintained to improved data, methods and further indicators;
b) that sufficient data are presently available to produce meaningful and comprehensive natural resource accounts for Canada that include non-market valuations;
c) that existing frameworks and methods (including national frameworks such as Statistics Canada's *Canadian System of Environmental and Resource Accounts* and the Canadian Council of Forest Ministers' criteria and indicators for sustainable forestry) provide an adequate basis for the construction of concrete and comprehensive resource accounts in Canada;
d) that there are no short-cuts in the construction stage, and that it is a mistake to rush towards bottom-line assessments before a full range of data from a wide range of sources is assembled for each set of resource accounts;
e) that meaningful natural resource accounts must include valuations of non-market resource and ecosystem functions, must account for the linkages among a wide range of ecological, social and economic variables, and must include local, regional, national and global impacts;
f) that natural resource accounts must be complemented and supplemented by other tools, such as an ecological footprint analysis, so that the responsibility for sustainable development is shared by both consumers and producers;
g) that, because policy development occurs at the provincial and regional levels as well as at the national level, any effort to develop national sustainability indicators must include and support parallel efforts at the sub-national level if these indicators are to have an impact in the policy arena.

B. Intended Audience and Communication Strategies

5. Audience

The principal users and beneficiaries of the GPI Atlantic research are intended to be:

a) Nova Scotia and Atlantic region provincial government policy makers for whom accurate and comprehensive information, particularly on natural resource health, is vital to informed decision-making and in evaluating the full environmental and social benefits and costs of alternative investment strategies;
b) Nova Scotia and Atlantic region citizen, voluntary, business, labor, professional, sectoral, and community groups who require relevant macroeconomic data to assess their well-being, lobby government, and advance their interests;
c) Journalists and news media who require accurate information to provide opinion and analysis;

d) Federal government agencies with a particular and ongoing interest in developing practical policy-relevant measures of sustainable development. These agencies include Statistics Canada, the Commissioner for the Environment and Sustainable Development in the Auditor-General's Office, the National Round Table on the Environment and the Economy, Environment Canada, and other bodies that are working with and seeking out existing templates to measure sustainable development and that are actively following developments in the field. For example, by expanding the usage of existing Statistics Canada time use surveys, environmental accounts and other sources, the Nova Scotia GPI can encourage the further development of the vital and innovative research and analysis that has helped to establish that agency as the top-ranking statistical bureau in the world.

Secondary users and beneficiaries of the GPI Atlantic research may include:

a) Researchers, statisticians, academics and others who are working to advance similar types of initiatives elsewhere;
b) Other provinces, the federal government and other jurisdictions that may not presently have a firm commitment to the actual adoption and use of measures of sustainable development, but that are likely to show increasing interest in the future as developmental work in the field proceeds. Ongoing cooperation with Statistics Canada ensures that the Nova Scotia GPI methods and data sources are applicable to and easily replicable by other governments. Data sources and methodologies are from established, published sources and are transparent in the reports.

   One clear project goal that has been explicit from its inception four years ago, is to work with other potential users in the coming months and years to establish accepted methodologies for inter-provincial comparability. In short, the current GPI Atlantic project is focussed on "plugging in" Nova Scotia numbers in order to demonstrate the actual measurability and practical applicability and utility of sustainable development indicators in one jurisdiction. However, the project maintains constant awareness of its connection to other like-minded initiatives and its potential relevance to other provinces and the federal government.

Generally, and most importantly as far as "audience" is concerned, future generations will benefit from economic activity that is sustainable and that ensures long-term prosperity. This larger goal is always uppermost in the minds of GPI Atlantic researchers -- we are doing this for the public good and for the benefit of our children.

We are confident that the GPI work can assist government to recognize and promote activity and values that diverse interest groups within Canada consider important. Because the work is fundamentally non-ideological and non-partisan, but attempts to reflect values and objectives common to all Canadians, the intended outcome is less polarity, greater agreement on common purpose and long-term national goals, and, thereby, better communication between government and the people it serves.

6. Communication Strategies

In releasing its reports and research results to date, GPI Atlantic is trying to reach three quite different target audiences: policy actors, academic experts, and the general public.

a) To reach government, results are communicated with a view to policy relevance, with particular policy implications and recommendations made very explicit and transparent. In addition, at the Nova Scotia government level, ongoing contact is maintained with relevant government departments during the "construction phase" of each report. This occurs through regular briefings and meetings, as well as through steering committees that include federal, provincial and municipal government representatives, who are given progress reports and who are invited to provide input on the direction of the research while it is in progress.

   Though slow, this process not only helps create a sense of buy-in and ownership by government officials in the developmental phase that can encourage later adoption of the measures, but also assists the GPI researchers in securing data access to necessary sources. N.S. government officials, as well as Statistics Canada and Environment Canada staff have been extremely helpful and cooperative during the last three years in assisting with data access in this way.

b) To communicate with experts, GPI Atlantic ensures that the reports and results are based in solid and strong research, that methodologies are completely transparent, that full attention is paid to detail and to the subtleties of complex issues and scientific interpretation, and that there is ongoing consultation with experts in the field. Draft reports are extensively reviewed by academic, government and independent experts, whose feedback is incorporated into later drafts. As well, GPI Atlantic takes pains to communicate that no report or results should be considered a "final" product, and that all methods, processes, data sources and results are completely open to improvements in future updates.

   As well, experts are often invited to participate in actual public report releases in various ways. Nova Scotia's leading criminologist was present at the public release of the Cost of Crime study; two leading economists were present at the release of the unpaid work components of the GPI; water quality experts reviewed not only the GPI Water Quality report in all its details, but even the press release that accompanied the report's public release. In all cases, GPI Atlantic has preferred to modify and rewrite its reports in light of expert feedback rather than to rush towards a public release before it is certain of expert endorsement.

c) To communicate with the general public, detailed and scientific information is distilled without jargon for press and public releases. The Nova Scotia press has reported GPI Atlantic results extensively and with great interest. In the last four months alone, GPI results have produced three lead front-page newspaper stories, in addition to coverage on CBC TV and Radio (news, Mainstreet, Maritime Noon, As It

Happens, etc.), CTV, and Global TV. After three years of ongoing press coverage, it is safe to say that the informed Nova Scotia public knows about the GPI work, that "GPI" and "sustainable development" are increasingly familiar concepts in the public arena, and that there has been some real penetration of Nova Scotia society.

In addition to communication through the press, short executive summaries also accompany each detailed report, and non-technical summaries of results are posted on the GPI Atlantic web site. As well, there has been a continuous demand by citizen and non-government groups for GPI presentations.

In short, GPI Atlantic has found that it is not impossible to have three very different target audiences simultaneously in an effective communications strategy. It is both our experience and our conviction that any sustainable development strategy must penetrate the system at all these levels. Government cannot act effectively in promoting sustainable development without citizen buy-in and understanding of the concept, and both levels depend on expert input and endorsement that is wider than the GPI team itself.

C. Key Issues for Consideration of the NRTEE SDI Steering Committee

1) **Definition:** It is the experience of GPI Atlantic that a clear definition of the mandate and scope of sustainable development indicators is essential if future results are not to produce a random set of unconnected indicators that are neither sufficiently exclusive nor sufficiently inclusive. In short, we have to determine what to exclude and what to include. Some middle ground is needed here. On the one hand, "sustainable development" is not completely identical and interchangeable with "quality of life," as Rob Smith eloquently demonstrated in his October presentation to the steering committee. On the other hand, as the Brundtland Commission clearly recognized, "sustainable development" does have profound economic and social implications, and reaches well beyond the bounds of "state of the environment" reporting. This discussion began at our October meeting, but has not, I think, been satisfactorily concluded or resolved.

   From the point of view of ***inclusion,*** the degree to which inter-generational and intra-generational equity are part of the definition cannot be swept under the rug, but must be carefully considered, as it was in the Brundtland Commission report. "Health" and "education" were mentioned by the Chair as worthy of "inclusion" but we have not yet considered what aspects of health and education are particularly related to our understanding of "sustainable development." Are some aspects of health and education indicators particularly relevant and others less so? For example, might "health promotion" indicators, based on broad determinants of health (including the physical environment) and having a long-term perspective, be more relevant to the view and perspective of sustainable development than "health care" indicators that deal with treatment of illness that has already occurred.

There are also clearly economic and social indicators that are directly relevant to any strategy of sustainable development. To take just one example, Anders Hayden's recent book, *Sharing the Work, Sparing the Planet: Work Time, Consumption and Ecology* (Toronto, 1999) demonstrates that taking economic productivity gains in increased leisure time rather than higher wages can contribute directly to more ecologically sustainable living patterns. Using a wide range of European models, Hayden shows that time use indicators on work hours and free time can provide important economic and social measures of progress towards sustainable development.

From the point of view of ***exclusion,*** the degree to which sustainable development indicators are or are not compatible with conventional economic growth statistics must be carefully considered. As implied in the Statistics Canada definition above, does sustainable development by definition point to a different model of economic development than one assuming the possibility of limitless growth? If we are to embrace the notion of "limits to growth," then what conventional indicators are excluded by definition from a sustainable development strategy?

Beyond the inclusion-exclusion issues, there is definitely a need for greater clarity on how to operationalize the concept of "sustainability"? Are we simply measuring "relative" progress towards "greater" sustainability (e.g. attainment of the Kyoto targets) as a sign of forward movement? Or are we going a step further to identify actual natural thresholds that may determine certain limits to human economic activity (e.g. what level of economic activity, greenhouse gas emission reductions, or efficiency measures are required in order to *stabilize* or *reduce* atmospheric greenhouse gas concentrations?) The latter approach involves a more "absolute" definition of sustainable development. The issue here is what are the *standards* against which we measure progress towards greater sustainability.

These are tough questions, and it is very tempting to say that we've had enough of defining sustainable development, and that it's time to move on. But without careful consideration of these issues at the start, it is literally guaranteed that they *will* come back to haunt the sustainable development initiative in the long run. At worst, the NRTEE process may actually be rejected by key groups, and its legitimacy undermined. Better to spend a little longer carefully defining the term "sustainable development" and the scope of the NRTEE exercise than to embark on an uncertain course that will create more confusion than clarity.

These critical issues are not likely to be resolved in another one-day meeting. Perhaps a full weekend retreat devoted entirely to this definitional and scope question is a better forum. What GPI Atlantic researchers do know from their experience is that there are no short-cuts here, and that some concentrated up-front effort in grappling with these core conceptual issues will be well worth the effort in focussing and clarifying later directions.

2) **Mandate of the SDI Committee:** While #1 above is a content question --what to include and exclude from the definition of sustainable development and thus from the indicator set, -- there is also a process issue that should be settled sooner rather than later. The term "steering committee" implies some decision-making authority. If that nomenclature is to be maintained, then a decision-making process should be agreed on, and committee members should have the clear option of registering their dissent from any decision on which they do not agree. Otherwise it will create considerable confusion to announce decisions in the name of the steering committee that have not been reached by a consensus of steering committee members. If, on the other hand, the committee chair, executive or members of the Round Table make all major decisions, then the committee should be clearly renamed an "Advisory Committee."

   Whatever decision is made, GPI Atlantic is more than willing to contribute whatever it possibly can to this national process, and to cooperate completely in offering any and all of its experience both as a member of the committee (whatever it is called) and through any contractual work that can help move the work of the committee forward. In short, GPI Atlantic shares completely the goals and spirit of the initiative and will offer whatever it can to ensure its success. However, some clarity of committee process and mandate will actually contribute to that success more certainly than confusion over decision-making processes. As the Finance Minister implied in his budget remarks, this sustainable development indicator initiative may well be the greatest legacy this government can leave to the people of Canada. "Doing it right," both in process and content, is critical to the initiative's success.

3) **Methodologies in Natural Resource Accounting:** We are well beyond the stage of arguing about *"whether"* a sustainable development initiative, and a policy-relevant set of indicators to measure its success, are timely and appropriate. That has already been agreed in the creation of a Commissioner for the Environment and Sustainable Development, in the Finance Minister's budget allocation for this purpose, in the NRTEE's own stated commitment, in the prescriptions of the new *System of National Accounts 1993,* in Statistics Canada's new *Canadian System of Environmental and Resource Accounts,* and in Canada's international commitments.

   The only question now is *"how"* to measure progress in sustainable development. In other words, the issue is identification of appropriate indicators and methods of measurement. While point #1 above indicates that considerable discussion is still necessary to determine *which* indicators to include and exclude, it is equally true that there are certain indicators on which there is no disagreement at all. No one would argue, for example, that assessing the health of our natural resources is not an essential component of any sustainable development strategy.

   A key issue, therefore, is not to wait until all definitional issues in #1 above are resolved before taking the next step, but assessing how to move ahead in the most timely possible way to *operationalize* the areas where agreement clearly exists. I am

certain (and we can test it out on January 17) that we could quickly get unanimous agreement around the table that a good set of natural resource accounts is an indispensable part of any set of sustainable development indicators. If we know that, then the only question is *how* we do the measuring. There is no reason to delay here.

At its January 17 meeting, the NRTEE SDI committee could give direction to the committee secretariat to plan and convene a retreat of natural resource accounting experts from around the country and perhaps internationally. There the experts would be locked away for a week and charged with the responsibility of coming up with an agreed set of criteria and methods of measurement that represent the "state of the art." It would be good to include pioneers in natural resource accounting from the World Resources Institute, Statistics Canada, the IISD, and statistical agencies in Norway and other countries that have taken the lead in this area.

The experts would convene both in plenary and in area focus groups (e.g. forest, fisheries, non-renewables and energy, soils, water, etc.) The question posed to the area groups would simply be: "What does a good set of forest (water, subsoil etc.) accounts look like, and how are the various measurements best made?" The experts would tackle difficult issues of alternative ways of assessing the economic value of non-market ecosystem functions, and would identify areas of clear agreement, areas where some progress can be made, and areas that require further work. In the latter case, they experts would not simply shelve the issue, but appoint a working group to continue investigating and resolving remaining issues. In short the week-long conference/retreat would come up with an actual methodology protocol that creates the practical guidelines for future hands-on natural resource accounting work in Canada.

4) **Identifying methodologies in other agreed areas:** If natural resource accounting is one area where we can actually proceed without delay to determine appropriate methodologies, the steering committee could likewise identify other agreed areas on which we can proceed in the same way as outlined above, without waiting for complete agreement on what indicators should and should not be included. I would suggest that ***greenhouse gas emissions, air quality, and solid waste management*** are three other areas that we could quite quickly agree on as appropriate in any set of indicators of sustainable development. If so, there is no reason not to proceed exactly as described in #3 above. In fact, the methodological discussions on these areas could take place during the same week-long indicator expert retreat.

   We may then wish to identify other slightly greyer areas on which more work must be done at the conceptual level before we can proceed to the methodological stage. That second-level set of indicators might include sustainable transportation, ecological footprint analysis and other more controversial concepts on which immediate agreement is less likely and which will require further discussion. These indicators may not be ready for a methodology conference, but may be the focus of a separate intensive weekend retreat whose task is to get them to that stage through more precise

definition. In other words, a separate task force can be assigned to the more difficult areas with the mandate to provide terms of reference for the methodologists a little further down the road.

A third-level set of indicators can then be identified that still requires more basic definitional decisions on what to include and exclude - e.g. what aspects of health indicator work are applicable to a sustainable development strategy? -- as described in #1 above. There is no reason that all these tracks cannot proceed simultaneously -- a methodology conference on agreed indicators, more precision and conceptual clarity on almost-agreed indicators, and more basic definitional work on areas that may or may not be included.

Basically, the issue is this: While one track of the NRTEE work involves stakeholder discussions, which are essential to have early "buy-in" by potential user groups who will be affected by the work, an equally important aspect of the committee's mandate is to develop the indicators themselves. A methodology conference, and parallel work on other indicators as described in #3 and #4 could initiate a "fast track" in the committee's indicator development work that parallels the stakeholder process.

5) **Monetization:** It would be appropriate for us to consider at an early stage both the strengths and limitations of monetizing economic values of environmental assets. When is that appropriate? And what is the proper relationship between physical indicators and economic ones? There are certain principles here that could be established from the start, and that I think can be agreed on without great controversy.

6) **Other Issues:** Needless to say, there is a wide range of other issues that are "key" to our work in the next two years. Some of these are included in the list of principles described above (2.1-2.4), which we have accepted as the basis of the Nova Scotia GPI work, but which will require discussion in committee:
   - How, for example, can the precautionary principle be applied to indicator work?
   - Is there agreement that the indicator work provides the accounting basis for (and is a potential precursor to) tax shifting and other methods of restructuring the system of financial incentives and penalties, as described in the section on full-cost accounting above?
   - In other words, how do we *situate* or place the SDI initiative in the context of other aspects of a sustainable development strategy? What can indicator work in particular contribute to actual policy development towards greater sustainability? If we could define explicitly a few major ways in which this initiative contributes to the development of a sustainable development strategy for the country, then the whole initiative will have greater policy relevance from the very start.

There are clearly several other key issues in the development of the SDI committee's work. But I think some of the above could provide a useful next step. Perhaps the January 17 meeting could also consider the limitations of the one-day meeting format for the in-depth discussions that are necessary on some of these key issues. Alternative forums

(such as the weekend retreat suggested above) might be considered to allow more profound and detailed follow-up discussions on some of the most important issues.

Announcing this indicator initiative in the year 2000 budget, Finance Minister Paul Martin declared that these indicators "could well have a greater impact on public policy than any other single measure we might introduce." That is a remarkable and powerful statement that requires a lot from the NRTEE and from the SDI committee. In the experience of GPI Atlantic, and thanks to the pioneers of the last 20 years who have brought natural resource and integrated environmental-social-economic accounting to the state it is in today, all the tools and methods exist to carry Mr. Martin's directive into practice. This certainly does not mean that this initiative will produce the "final word" on sustainable development indicators and methods of measurement. But there is no obstacle to providing Canada with a usable and workable set of measures within the three-year time-frame of the year 2000 budget initiative.