Literature Review of Frameworks for Macro-indicators

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Executive Summary

There has been an explosion of interest in recent years in Canada and other countries in macro-indicators and composite indexes of economic and social well-being. This reflects growing recognition of the important role macro-indicators can play as a tool for evaluating trends in and levels of economic and social development and for assessing the impact of policy on well-being. This report provides a literature review of conceptual/operational frameworks for the development of macro-indicators that give an assessment of economic, labour market and social conditions or states of well-being.

The document is divided into three major parts. The first provides an analysis of frameworks for macro-indicators by discussing general framework issues. The second part identifies and describes six specific frameworks for macro-indicators which the author regards as particularly important or relevant, and discusses the strengths and weaknesses of these sets of indicators/composite indexes. The third and by far the longest section provides a description of an additional 31 sets of indicators and composite indexes broken down into economic, social, economic/social, and labour market areas.

The term "framework" can be interpreted in a number of ways. This document identifies three such interpretations. First, framework can refer to the choice of how the variables are presented, either in some aggregative manner or as a set of indicators. Second, it can refer to the manner in which a set of variables from a much larger group is identified and included in the set of indicators or index. From these two perspectives, any set of indicators or composite index can be considered a "framework." Third, a framework can be a set of criteria by which indexes are evaluated. All three types of frameworks are discussed in this report, with the emphasis on the first two.

It is important to note that the term framework in this report is used in the sense of a macro-indicator framework for assessing economic and social trends rather than in the sense of a framework for the analysis or evaluation of public policy.

There is a fundamental division in the indicators literature between those who choose to aggregate variables into a composite indicator and those who do not. The aggregators believe there are two major reasons that there is value in combining indicators in some manner to produce a bottom line. They believe that such a summary statistic can indeed capture reality and is meaningful, and that stressing the bottom line is extremely useful in garnering media interest and hence the attention of policy makers. The second school, the non-aggregators, believe one should stop once an appropriate set of indicators has been created and not go the further step of producing a composite index. Their key objection to aggregation is what they see as the arbitrary nature of the weighting process by which the variables are combined.

There are two basic frameworks for aggregating variables. One is a monetary framework where variables are monetarized and then added up in the tradition of GDP construction. The second is the composite indicator approach where variables or domains based on sets of variables are combined with weights. A hybrid approach that combines the monetary and composite frameworks is also possible.

Both aggregative and non-aggregative approaches to macro-indicators require a set of variables deemed important. A number of issues must be resolved related to variable selection for well-being indicators, as outlined below. Different frameworks can be used in this determination.

- What domains of interest to the researchers (economic, social, environmental, etc.) are to be chosen?

- What variables within each domain are to be chosen and will objective or subjective data be used?

- What populations are of interest to the researcher (all persons, certain age groups or genders, etc.)?

Of the 37 sets of indicators and composite indexes identified for inclusion in this survey, six have been selected as of particular relevance because of the lessons they provide and are described and evaluated in part two. Three have been developed by international or supranational organizations and three are Canadian. Four involve sets of indicators and two are composite indicators. They are the EU social indicators on social inclusion, the Human Development Index, the 2001 set of social indicators developed by the OECD, the Index of Economic Well-being, the Treasury Board Quality of Life Indicators, and the Economic Gender Equality Indicators.

Part three of the report provides a comprehensive survey of the frameworks for the most important macro-indicators in the economic, social and labour market areas that have been developed throughout the world. The actual values and trends of the macro-indicators are not presented. Environmental indicators have been excluded. The focus of the survey is on macro-indicators at the national and international levels. Provincial/state and community indicators have been excluded except in cases where it was felt they were particularly innovative.

Literally hundreds of sets of indicators and composite indices on economic and social well-being have been developed throughout the world. The key criterion for inclusion in this survey was that the set of indicators or composite index is considered innovative and advances the debate. Many of the sets of indicators and composite indexes included in this report have been developed by international organizations. These organizations have considerable resources to devote to indicator and index development and they see it as their role to identify and build on best practices in the indicators and index field at the national level.

A secondary criterion was that the documentation for the sets of indicators of composite indexes was available in English or French. Finally, most sets of indicators and composite indexes of economic and social well-being developed in Canada (13 out of 37 sets of indicators and composite indexes) were included given their obvious relevance to Human Resources Development Canada (HRDC).

Macro-indicators are divided into four basic categories: economic (or at least primarily economic), social, both economic and social, and labour market. The third category reflects the reality that many macro-indicators include both economic and social variables and cannot be described as primarily one or the other. Within each of the four categories macro-indicators have been broken down into macro-indicators involving sets of indicators where there is no aggregation into a composite index and macro-indicators which involve the construction of a composite index.

The report concludes that no existing framework currently includes all important concepts and linkages and that it is unlikely that one ever will. As the survey of the macro-indicators literature reveals, the development of a framework for macro-indicators involves choices related to the domains of interest, the purpose for which the indicator is designed, and the population to be covered, among others. Choices or tradeoffs must be made and a balance struck between conceptual sophistication and transparency and between complex linkages that could potentially confuse the user and simplicity.

Literature Review of Frameworks for Macro-indicators[1]

Introduction

There has been an explosion of interest in recent years in Canada and other countries in macro-indicators and composite indexes of economic and social well-being. This reflects growing recognition of the important role macro-indicators can play as a tool for evaluating trends in and levels of economic and social development and for assessing the impact of policy on well-being. This report provides a literature review of conceptual/operational frameworks for the development of macro-indicators that provide an assessment of economic, social and labour market conditions or states of well-being.

The document is divided into three parts. The first provides an analysis of frameworks for macro-indicators by discussing general framework issues. The second part identifies and describes six frameworks for macro-indicators that the author considers particularly important or relevant and comments on their strengths and weaknesses. The third and by far the longest section provides a description of an additional 31 sets of indicators and composite indexes broken down into economic, social, economic/social, and labour market areas. Social and labour market indicators and indexes include variables related to skills and learning. Composite indexes for skills and learning have not been developed.

Part One

Analysis of Frameworks for Macro-indicators: General Framework Issues

The term "framework" can be interpreted in a number of ways. This document identifies three such interpretations. Framework can refer to the choice of how the variables are presented, either in some aggregative manner or as a set of indicators. It can refer to the manner in which a set of variables out of a much larger universe is identified and included in the set of indicators or index. From these two perspectives, any set of indicators or composite index can be considered a "framework". Finally, a framework can be a set of criteria by which indexes are evaluated. All three types of frameworks are discussed in this report, with the emphasis on the first two.

It is important to note that the term framework in this report is used in the sense of a macro-indicator framework for assessing economic and social trends rather than in the

sense of a framework for the analysis or evaluation of public policy. The two uses of the term are obviously very different. The former gives a broad picture, while the latter is narrowly focused.

I Aggregative Versus Non-Aggregative Frameworks

There is a fundamental division in the indicators literature between those who choose to aggregate variables into a composite indicator and those who do not. This decision in effect divides the indicators research community into two camps. The aggregators believe for two major reasons there is value is combining indicators in some manner to produce a bottom line. First, they believe such a summary statistic can indeed capture reality and is meaningful. Second, they stress that bottom lines are extremely useful in garnering media interest and hence the attention of policy makers. The non-aggregators believe one should stop once an appropriate set of indicators has been created and not go the further step of producing a composite index. Their key objection to aggregation is what they see as the arbitrary nature of the weighting process by which the variables are combined.

A. Approaches to Aggregation

There are two general types of approaches that can be used to aggregate variables (Gadrey and Jany-Catrice, 2003:7). One is a monetary framework where variables are monetarized and then added up in the tradition of GDP construction. The two best known examples of the application of this framework are the Measure of Economic Welfare (MEW) developed by William Nordhaus and James Tobin (1972) of Yale University and the Genuine Progress Indicator (GPI) developed by the San Francisco think tank, Redefining Progress (Cobb, Halstead and Rowe, 1995).

The second is the composite indicator approach where variables or domains based on sets of variables are combined with weights.[2] The most famous example of this framework or approach is the Human Development Index (HDI) produced by the United Nations Development Programme (2002). There are many other examples. A hybrid approach that combines the monetary and composite frameworks is also possible, as used by the Index of Economic Well-being (IEBW) developed by the Centre for the Study of Living Standards (Osberg and Sharpe, 1998, 2002a,b,c).

It should be noted that the aggregation of indicators into an index either via the monetarization of variables or by assigning weights to individual variables to create a composite index differs from what would be obtained with a social welfare function. A social welfare function would aggregate at the individual's level (their utility functions), thereby taking into account tradeoffs at this level between present and future consumption, wealth and risks when calculating the levels and evolution of society's

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[2] It should be noted that there are many methodological aspects to the aggregation issue. See Sharpe and Salzman (2003) for a comprehensive discussion of methodological issues, including aggregation issues, encountered in the construction of composite indexes of economic and social well-being.

well-being. Also, the social welfare function may give different weights to certain individuals (i.e. the worst-off) and tradeoffs between components (e.g. present versus future consumption, uncertainty, social 'bads') may change as society becomes richer and the worst off better off.

Despite these differences between the composite indexes approach to aggregation and the social welfare function approach, it is relevant to note that A.K. Sen, a Nobel Prize winning economist and one of the major contributors to the theory of social welfare functions, sees significant value in the simple aggregation procedure used for composite indexes. He has been one of the key developers of the Human Development Index, which is not based on a rigorous social welfare function framework. There is also the question of whether a social welfare function can be meaningfully constructed for the real world, a task that Arrow's Impossibility Theorem contends cannot be accomplished.[3]

The issue of the determination of societal weights for composite indexes is crucial for the aggregation procedure. Weights may be determined by expert panels, focus groups, surveys, or based on the values of the index developer. Alternately, all variables may be given equal weights. This issue is beyond the scope of this paper and discussed in detail in Sharpe and Salzman (2003).

To conclude this discussion, the advantages of a composite index over a set of indicators, that is the benefits of aggregation of variables over non-aggregation, include the creation of a bottom line that capture both the media's and the public's attention. The benefits of a composite index based on the aggregation of indicators relative to a social welfare function include simplicity and transparency, even at the cost of less theoretical "purity".

B. Non-Aggregative Approaches

There are many examples of studies that have proposed a set of indicators without attempting to create one bottom line. However, many studies of this type do present scorecards by tallying the number of indicators trending up versus the number trending down or use the top performers as benchmarks and rank other countries in relation to the benchmark performer. The social indicators movement that developed in the 1970s (Henderson, 1974) refused to aggregate the individual variables into a composite measure. Many indicators researchers have followed this tradition. These include the following:

- researchers associated with the attempt by the EU to develop a meaningful set of social indicators to gauge policy (Atkinson et al, 2002);

- the National Roundtable on the Environment and the Economy (2003), which recently released a report highlighting six environmental indicators;

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[3] Arrow (1951) discusses a number of criteria that a reasonable social welfare function should respect, in terms of the preferences of individual citizens, and argues that it is impossible for any function to respect every criterion simultaneously. For a discussion see Rosen (2001, chapter 6).

- the Canadian Policy Research Networks (2002), which recently produced a report on the Quality of Life of Canadians that focused on a number of indicators;

- the Conference Board of Canada annual publication *Performance and Potential* which in the 2002 edition highlighted indicators in a number of areas;

- the report by the Treasury Board (2002) assessing Canada's economic and social performance; and

- the Quality of Life Index produced by Natural Resources Canada (Morton, 2003), which has developed a set of QOL indicators for all major census area of Canada.

The best known macro-indicator in the world is probably the Human Development Index (HDI) developed by the United Nations Development Program. It has been severely criticized for combining together indicators of income, health and education to create a composite index, both on the grounds that the weights are arbitrary and unjustified and on the grounds that the three components of the index are highly correlated and hence give redundant results.

But it is no accident that the HDI is so well known. Its bottom line rankings capture media and public attention, much more than would be received by a set of indicators. The view of A.K. Sen, on this issue is instructive. He was originally opposed to aggregating different indicators into a composite index on methodological grounds. But he now considers his earlier view mistaken as it was too purist. He now recognizes that the success of the HDI in fostering debate on what constitutes and determines human development would not have happened if the exercise had stopped at the indicators phases and not created an index.

It is understandable that government departments and agencies, and many international organizations involved in indicator development do not want to create a composite index because any weighting process is value-laden and these organizations want to appear neutral. Indeed, the real work in the area of indicator development is the data and the framework. Significant resources of government departments and international organizations are essential for progress in these areas. The aggregation process itself, excluding the weighting issue, is trivial. It is thus more appropriate that non-governmental organizations be the leaders in the composite index field given their greater freedom to set weights.

II Frameworks for Variable Selection

Both aggregative and non-aggregative approaches to macro-indicators require a set of variables deemed important. The literature points to a number of issues to be resolved related to variable selection for well-being indicators, as outlined below. Different frameworks can be used in this determination.

- What domains of interest to the researchers (economic, social, environmental, etc.) are to be chosen?

- What variables within each domain are to be chosen and will objective or subjective data be used?

- What populations are of interest to the researcher (all persons, certain age groups or genders, etc.)?

A. Domain Selection

The obvious starting point for the development of macro-indicators is the decision on what domains or general areas of Quality of Life (QOL) or well-being will be covered. Indeed, the selection of domains to a large degree determines QOL or well-being rankings across countries (Rahman, Mittelhammer, and Wandschneider, 2003). At the broadest level domains can include basic dimensions of quality of life, such as economic, social, and political, and environmental well-being as well as education and health.

The interests and concerns of the index constructor drive the choice of domains to be covered. A key distinction in the literature is between indexes or sets of indicators that are based on a well-developed framework reflecting guiding principles and those that are looser and more ad hoc.

Examples of sets of indicators or composite indexes whose domain selection appears to have been done without a well-developed framework and strong guiding principles include the following.

- The Index of Social Progress (Estes, 1997) includes the following domains: status of women, defense effort, demography, geography, cultural diversity, and welfare effort.

- The Calvert-Henderson Quality of Life Indicators (Henderson, Lickermanm and Flynn, 2000) includes the following domains: education, employment, energy, environment, health, human rights, income, infrastructure, national security, public safety, recreation, and shelter.

- The Conference Board of Canada 2002 *Performance and Potential* report benchmarks Canada's socio-economic performance against 24 OECD countries for 95 variables in six categories: the economy (10 indicators),

innovation (14), environment (15), education and skills (17), health (25), and society (14).

Examples of sets of indicators or composite indexes whose domains are grounded in a well-developed framework include the following.

- For its social indicators work, the OECD (2001a,b) divides indicators into three categories called social context, social status and societal response variables based on the pressures-state-response (PSR) framework developed for environmental indicators. This separates broad indicators of what government and society do (response indicators) from broad indicators of what they are trying to influence (context and status indicators) and makes transparent the relationship between variables.

- The EU social indicators project (Atkinson et al, 2002) developed nine principles for the identification of indicators of social inclusion, including a set of lead indicators (one for each domain) and a set of supporting indicators.

- The Index of Economic Well-being developed by the Centre for the Study of Living Standards (Osberg and Sharpe, 1998, 2002a,b,c) is based on four well established domains or components of economic well-being: consumption flows, stocks of wealth, income equality, and economic security.

B. Variable Selection

Like domain selection, the selection of variables is based on the perception of the developers of what constitute the key variables of a domain. A major consideration is availability of time series and/or cross-section data. Empirical representation must be given to any ideal variable if an index or set of indicators is to be developed to assess trends in well-being over time or across space. A number of frameworks can be adopted for variable selection. Three are highlighted below.

- The Index of Economic Well-being, for example, uses a "named risks" approach to the identification of the variables that capture economic insecurity based on the 1948 UN Declaration of Human Rights that identified risks arising from unemployment, illness, widowhood, and old age.

- A statistical approach to variable selection involves calculating correlation between potential variables and then choosing the variables that are less correlated in order to maximize the independence of the variables chosen.

- An alternative to researchers or experts selecting variables, and the weights that will be given variables, is to use input from the general population on what values, domains and specific variables are important to them. This information can be obtained from surveys and focus groups. The Canadian Policy Research Networks (2002) has used this approach in Canada to select

QOL indicators for the Treasury Board of Canada for its quality of life indicators.

C. Population Coverage

Macro-indicators generally relate to the overall population. However, they certainly can be developed for sub-sets of the population on the basis of many variables including geography, gender, age, linguistic group, industry, occupation, social class, income/wealth bracket, marital status, family status, ethnic group, visible minority status, aboriginal status, disability status, and educational attainment. Below are two examples of sets of indicators or indexes that have focused on certain groups.

- The Index of Social Health (Brinks and Zeesman, 1997 based on Miringoff and Miringoff, 1999) is based on a framework for index construction using the different stages of the life cycle and develops separate indicators for children, youth, adults, and the elderly. It is argued this approach is useful because: 1) age groups are universal, with everyone potentially passing through all age groups; 2) age groups are conceptually integrated across components, creating a holistic framework; 3) age groups highlight several important contemporary trends, such as deteriorating status of children and improved status of the elderly; and 4) age groups are readily understood by the public.

- The economic gender equality indicators developed by the Status of Women in Canada (Federal Provincial/Territorial Ministers Responsible for the Status of Women, 1997) focus on women's economic status across Canada with the objective of enhancing the understanding of the economic reality facing women. The framework for the project determined that the indicators be developed: 1) in key areas that affect women's economic autonomy including income and earnings, paid and unpaid work, and education and training; 2) in time series to show trends; 3) from existing data; 4) for Canada and the provinces and territories; 5) to reflect the situation of women with different age, education, occupation, and employment characteristics; and 6) to account, in particular, for the presence of young children where possible.

III. Frameworks for Evaluation of Macro-indicators

Frameworks have also been developed for the evaluation of macro-indicators, although a full discussion of these frameworks is beyond the scope of this report. For example, a committee of the International Society for Quality of life Studies has proposed six criteria for the evaluation of Quality of Life Indexes and six criteria for the evaluation of the domains covered by QOL indexes (Hagerty et al, 2001). The committee then applied these criteria to 22 QOL indexes. The QOL evaluation criteria for the QOL Indexes follow.

- Have a clear practical purpose and that such purposes include usefulness for public policy and measurement of trends in and the levels of economic and social well-being.

- Be well grounded in well-established theory, defined as a set of concepts and causal paths that specify how QOL is related to exogenous and endogenous variables where 'well-established' means that the theory has been subjected to empirical test.

- Be reported as a single number but capable of being broken down into components as a single number allows citizens and policymakers to assess whether overall QOL is improving (but, as noted earlier, the problems in combining disparate domains of QOL are considerable, weights vary among people, and most public policy interventions can be achieved by merely tracking the components of QOL).

- Be based on time series data to allow monitoring, as this is crucial for public policy in order to assess whether conditions are improving for targeted populations and to forecast future conditions.

- Be reliable, valid and sensitive, thus all QOL indicators must be based on variables that can be measured in a statistically reliable and valid manner and must be sensitive in that they show some movement over time, particularly in response to influences such as public policy.

- Help policy makers to assess programs and policies at various levels (e.g. individual, family/household, community, state/province, national, and international).

Hagerty et al (2001) also proposed the following criteria for the evaluation of domains included in QOL indexes (which would be modified for more narrowly defined indexes).

- The domain encompasses the totality of life experience. It is argued that since QOL refers to the quality of a person's whole life, not just the component

parts, if QOL is to be segmented into components or domains, those domains must represent or sum to the total construct.

- An indication of the degree to which a domain encompasses a substantial but discrete portion of the QOL construct. The number of possible domains is infinite so parsimony is needed. This can be achieved through calculations of shared variance between domains and by the amount of unique variance contributed to the aggregate QOL score by each domain.

- The ability of the domain to be measured in both objective and subjective dimensions. It has often been found that objective indicators of QOL do not correlate highly with subjective indicators. Both subjective and objective indicators are necessary, but not sufficient (given their lack of correlation), conditions to capture the totality of life experience, so both should be included in QOL measurement.

- The relevance of the domains for all persons. It is not appropriate to use QOL instruments or indicators designed for specific sections of the population (e.g. the disabled) for the general population.

Part Two

Discussion of Specific Frameworks for Development of Macro-indicators

This part highlights and assesses what the author considers the six most relevant indicators and composite indexes from the 37 surveyed. Exhibit 1 at the end of this report provides a summary of the domains covered and the variables or indicators for the highlighted indicators.

An important caveat is in order. The appropriateness of a particular framework is in the eye of the potential user. It depends on what the framework was designed to do, whether it is to assess trends, to serve as a tool for policy makers to evaluate policies and programs, or to be used as a rallying point for advocacy groups with a certain agenda. For example, a framework whose purpose is to shed light on a particular trend in a balanced manner might be judged inappropriate by an advocacy group when the framework produced results that did not correspond to its interest. Equally, the strengths and weaknesses of a particular framework depend on the values, perspective and needs of the evaluator.

These six sets of indicators and composite indexes have been selected for their particular relevance because of the lessons they provide as macro-indicator frameworks (not policy frameworks for policy analysis and evaluation). They give a broad picture of economic and social trends and do not provide a focused picture of any one aspect. In the author's view, these sets of indicators or composite indexes represent the best practice in

the field. Three have been developed by international (or supranational) organizations [the EU social indicators on social inclusion, the Human Development Index (HDI), the 2001 set of social indicators developed by the OECD] and three are Canadian (the Index of Economic Well-being, the Treasury Board Quality of Life Indicators, and the Economic Gender Equality Indicators). Four involve sets of indicators and two are composite indicators.

IV International Frameworks for Macro-indicators

A. EU Social Indicators

The international (or supranational) organization that has done the most work on social indicators is the European Community or Union (EU). Indeed, development of these indicators has been an explicit part of the EU social agenda. Since it was felt impossible to monitor progress in EU member states with regard to social inclusion in the absence of comparable, quantitative indicators, the government of Belgium decided to make the establishment of common European social indicators a priority for its presidency of the Council of the European Union during the second half of 2001. The Belgian government insisted that agreement be found on a multidimensional set of indicators to quantify the multidimensional nature of social exclusion.

For the EU, " … the social indicators themselves reflect our sense of democracy through a dialogue with socially excluded groups about the frameworks to be used, and through explicit measurement of poor people's own experience of participation, freedom, and social inclusion…. The ultimate effectiveness of social indicators depends on there being the political will to exploit them fully and put into effect the necessary policies" (Atkinson et al, 2002:x-xi).

A committee of experts was asked to produce a report by the end of 2001 that recommended a common set of indicators for all EU members (Atkinson et al, 2002), although it was recognized that members could complement the EU indicators with country-specific indicators. The purpose of the establishment of common indicators was not a naming and shaming exercise, that is, not a vehicle for defining a pecking order among EU members. The report prepared, entitled *Indicators for Social Inclusion in Europe*, is known as the Atkinson report (Atkinson et al, 2002) after well-known economist Tony Atkinson of the London School of Economics and one of the committee members.

The Atkinson report represents the most sophisticated work on social indicator construction available. As noted, the report is not concerned with social indicators in general, but with social indicators as performance measures that play a political role in the development of the EU agenda of social inclusion. Consequently, it is not enough that indicators capture social conditions. They must have a clear normative connotation. This means they cannot be constructed in an ad hoc manner based on underlying principles, be

they implicit or explicit. The laying out of these principles fosters public debate among the social actors.

The report proposes six principles that apply to single indicators and three principles that apply to a portfolio of indicators (Atkinson et al, 2002:21-26). The six principles for single indicators are outlined below.

- *An indicator should identify the essence of the problem and have a clear and accepted normative interpretation.* This means that the indicator must be recognized as meaningful by users of all kinds and must appear "reasonable" to the general public. There should be general agreement that a movement in a particular direction represents an improvement. The indicator should be in a form that allows national targets to be set and performance to be assessed.

- *An indicator should be robust and statistically validated.* This means that the indicator should be measurable in a way that commands general support. Data employed should be regarded as statistically reliable and should avoid arbitrary judgments.

- *An indicator should be responsive to effective policy intervention but not subject to manipulation.* This means that indicators must reflect the successful intervention of policy, but at the same time it must not be possible for governments to improve their score by artificial policy changes.

- *An indicator should be measurable in a sufficiently comparable way across member states, and comparable as far as is practical with the standards applied internationally by the UN and the OECD.* This means that indicators that are over-sensitive to structural differences across countries or raise specific problems of interpretation for particular countries should be avoided.

- *An indicator should be timely and susceptible to revision.*

- *The measurement of an indicator should not impose too large a burden on member states, on enterprises, or on EU citizens.*

The three principles applying to a portfolio of indicators follow.

- *The portfolio of indicators should be balanced across different dimensions.* There are costs in terms of lost transparency from having too extensive a range of indicators. A selection is needed and this selection must ensure that all main areas of concern are covered in a manner that reflects a balanced representation of Europe's social concerns.

- *The indicators should be mutually consistent and the weight of single indicators in the portfolio should be proportionate.* This latter term means it is

much easier to interpret a set of indicators when the individual components have degrees of importance that are not grossly different.

- *The portfolio of indicators should be as transparent and accessible as possible to EU citizens.*

The Atkinson report provides a detailed discussion of the properties of indicators and makes a number of recommendations and observations, including the following.

- The fundamental concern when measuring social inclusion as part of the EU monitoring process is with the position of individual citizens, and in general statistics should be presented in terms of counting individuals.

- Equality of treatment between women and men is a prominent part of the EU agenda. This means that a gender equality perspective should be integrated into all policy areas, a process known as "gender mainstreaming." Consequently, all indicators must be broken down by gender.

- In relation to the debate over relative versus absolute indicators, the report argues that a more valid contrast is between measures designed to move over time in line with the general standard of living and those that are up-rated only by the increase in prices and are intended to represent a fixed level of purchasing power.

- Sole reliance on objective indicators may reduce the legitimacy of the indicators exercise. Subjective indicators should be considered when the standard or target is set on the basis of citizen's responses to survey questions and when it is desirable to include subjective evaluations by the population of their own situation.

- Indicators can focus on both changes and levels. The case for focusing on changes is strongest when indicators cannot be compared across countries, but the errors are constant over time, and when a country wishes to emphasize progress toward closing a gap, as opposed to its inferior level performance.

- The construction of social indicators is necessarily a compromise between the theoretical definition and the empirically possible. This makes the further development of the European Statistical System a major priority. A systematic validation procedure should be associated with each indicator, assessing its reliability in the light of all available sources.

In terms of recommendations on the actual indicators, the Atkinson report proposed a three-tier structure of indicators. Level 1 consists of a small number (around 10) of lead indicators for the main fields to be covered. Level 2 indicators, which would not be limited in number, support the lead indicators and describe other dimensions of the challenge. Both Level 1 and 2 indicators would be commonly agreed upon and defined

by all member states. Level 3 indicators would be decided upon by individual member states to highlight national specificities.

The report argues that this three-tier structure has a number of advantages. It allows the principle of balance across different dimensions to be satisfied without restricting the scope of individual fields. A list of ten lead indicators would be relatively easy to understand by the public.

The report stresses that indicators should be presented in the form of a level of performance and not as a ranking. This is because the aim of policy is to improve performance and bring all countries to a high level. If all countries perform badly, a ranking would give no indication of the need for action.

A key consideration is whether the lead indicators should be added up to provide a total score for each country. Such an aggregate performance measure can serve the twin functions of summarizing the overall picture and communications. The major challenge is the difficulty in EU countries reaching agreement on weights. Two different forms of aggregation can be distinguished. The first combines aggregates. The second combines different elements of deprivation at the individual level (which are then summed over the individuals to form an aggregate index for the country).

The Level 1 or lead indicators for social inclusion recommended by the Atkinson report are outlined below:

- risk of financial poverty as measured by 50 and 60 per cent of national median income using the OECD modified equivalence scale;

- income inequality as measured by the quintile share ratio;

- proportion of those aged 18-24 who have only lower secondary education and are not in education or training leading to a qualification at least equivalent;

- overall and long-term unemployment rates measured on an ILO basis;

- proportion of the population living in jobless households;

- proportion failing to reach 65, or the ratio of those in bottom and top income quintiles who classify their health as bad or very bad on the WHO definition; and

- proportion of people living in households that lack specified housing amenities or have specified housing faults.

The Level 2 indicators are:

- proportion of persons in households below 40 per cent and 70 per cent median income, and proportion below 60 per cent of median fixed in real terms on a specific date;

- value of 60 per cent of median threshold in purchasing power terms for one and four person households. ;

- proportion of the population living in households that are persistently at risk of financial poverty;

- mean and median equivalized poverty gap for the 60 per cent median;

- income inequality as measured by the decile ratio and Gini coefficient;

- proportion of the population aged 1-59 (64) with only lower secondary education or less;

- proportion of discouraged workers, proportion non-employed, and proportion of involuntary part-time work (as a percentage of the total population aged 18-64 excluding those in full-time education);

- proportion of people living in jobless households with income below 60 per cent of the median;

- proportion of employees living in households at risk of poverty (60 percent median);

- proportion of employees who are low paid;

- proportion of people unable to obtain medical treatment for financial reasons or on account of waiting lists;

- proportion of people living in households that are in arrears on rent or mortgage payments; and

- proportion of people living in households unable in an emergency to raise a specified sum.

The report points out however that the choice of indicators should not be regarded as fixed for three reasons. First, as experience is gained, the definition and implementation of indicators can be refined. Second, the social and economic situation is constantly changing generating new issues and challenges. Third, discussion of indicators needs to be broadened responding to the views of social partners, non-governmental organizations, and those experiencing social exclusion.

The European Community (EU) social indicators project on social inclusion is undoubtedly the most important social indicators project that has ever taken place. This is so for several reasons. First, the project has been initiated at the highest political level and will play a crucial role in the implementation of the EU social agenda. The EU appears to take indicators very seriously. Second, the EU has allocated significant resources to social indicator development. Third, many of the world's leading indicator experts are involved in the project. Fourth, the project has produced a very sophisticated framework for indicator development, as has been outlined in this report.

The strength of the EU social indicators project is that it represents the state of the art in terms of indicator development, particularly for OECD countries. All serious students of indicators should read the report on social indicators. A weakness from the point of view of a Canadian perspective is that the EU project focuses exclusively on social inclusion, a concept and issue that is not explicitly on the political agenda in Canada (although aspects of social inclusion such as poverty certainly are). Nevertheless, there is much to learn from the EU indicators work.

A second weakness of the EU social indicators project, given its objective to motivate the development of public policies to increase social inclusion in EU countries and to monitor the impact of policies on social inclusion, is that "macro" changes affect the indicators. This makes it very difficult to separate the effect of macro changes from policy-induced changes, particularly for income-based indicators. Positive effects of policy initiatives may be mitigated by other independent changes in the economy or society. Simulation models are needed to disentangle the effect of the two forces, but these simulations may not capture behavioural effects. A recent simulation of the impact of macro changes on EU indicators for social inclusion (Feres et al., 2003) found that the response of the different indicators to these changes varied significantly across indicators and the response for a given indicator to a change varied considerably across countries. Thus the interpretation in the movement of the EU social indicators, that is the causal relationships, is difficult. This criticism is of course true for all indicators.

B. Human Development Index (HDI)

Probably the best-known composite index of social and economic well-being is the Human Development Index (HDI), developed by the United Nations Development Programme (UNDP). The index was first published in 1990. This index is particularly well known in Canada, as the federal government has publicized its finding that Canada ranked number one consistently in the 1990s. The most recent release of the index in July of 2003, ranked Canada number eight, down from third in 2002. The HDI receives much media attention in Canada. Because of frequent changes in methodology, the index is used more for cross-national comparisons than for tracking trends in human development over time within one country.

The HDI is based on three indicators: longevity, as measured by life expectancy at birth; educational attainment, as measured by a combination of adult literacy (two-thirds weight) and the combined first-, second- and third-level gross enrolment ratio (one-third weight); and standard of living, as measured by, real GDP per capita in Purchasing Power Parity (PPP) terms.

For the construction of the index, fixed minimum and maximum values have been established for each of these indicators.

- Life expectancy at birth: 25 years and 85 years
- Adult literacy: 0% and 100%
- Combined gross enrolment ratio: 0% and 100%
- Real GDP per capita: $100 and $40,000 (US dollars in PPP terms).

The UNDP also has developed a gender-related development index (GDI). The difference with the HDI is that the GDI adjusts the average achievement of each country in life expectancy, educational attainment, and income in accordance with the disparity in achievement between men and women. A weighting formula is used that expresses a moderate aversion to inequality.

The UNDP has also developed a gender empowerment measure (GEM) to measure the relative empowerment of women and men in political and economic spheres of activity. It is based on the gender shares in the areas of parliamentary representation, administrative and managerial positions, professional and technical positions, and earned income.

Finally, the UNDP has developed a Human Poverty Index (HPI). For developing countries, the HPI-1 concentrates on deprivations in three essential dimensions of human life already reflected in the HDI – longevity, knowledge and a decent standard of living. The first deprivation relates to survival (the vulnerability to death at a relatively early age). The second relates to knowledge (being excluded from the world of reading and communication). The third relates to a decent standard of living in terms of overall economic provisioning. The deprivation in longevity is represented by the proportion of the population not expected to survive to age 40. The deprivation of knowledge is represented by the proportion of the population that is illiterate. The deprivation of a decent standard of living is represented by three variables – the proportion of the population without access to safe water, the proportion without access to health services, and the proportion of moderately and severely underweight children under five.

For industrial countries, the HPI-2 concentrates on deprivations in four dimensions of human life quite similar to those in the HDI – longevity, knowledge, a decent standard of living, and social exclusion. The deprivation in longevity is represented by the proportion of the population not expected to survive to age 60, the deprivation of knowledge by the proportion of the people that is not functionally literate as defined by the OECD, the deprivation in a decent standard of living is represented by the proportion of the population living below the poverty line set at 50 per cent of median

disposable personal income, and the deprivation of social exclusion is measured by the long-term (12 months or more) unemployment rate.

Many commentators in Canada, including representatives of the right and left, are critical of the HDI, and in particular the uses made of it in this country. This critique may in part be motivated by the fear that the index's good news message may mitigate pressures for the adoption of the policies they are recommending (e.g. tax cuts, increased social spending, etc.).

If the EU social indicators project represents the gold standard for social indicators, the Human Development Index (HDI) produced by the United Nations Development Programme represents the gold standard for composite indicators. This is the case for a number of reasons. First, the HDI is by far the best-known composite indicator in the world, reflecting the fact it has been around since 1990 and that it is produced by a high-profile UN agency. Second, the HDI uses a simple framework for identifying what constitutes human development, namely income, health and education, which is intuitive and easy to understand. Third, despite the apparent simplicity, there is much technical sophistication behind the HDI. Nobel prize winning economist A.K. Sen contributed significantly to the conceptual development of the Index.

Despite Canada's stellar rankings on the HDI in the 1990s, the index has limited relevance to Canada in its current form. This is because the index is for all countries and the wide range in variables between the developing and developed countries means that it is difficult to differentiate performance among the developed countries. In addition, the HDI includes only a very small number of variables (five), although they are admittedly well-chosen and important ones. This means the HDI fails to capture many dimensions of economic and social well-being.

Nevertheless, the methodologies used by the HDI and its associated composite indexes, especially the Human Poverty Index for developed countries, remain a great strength and continue to have considerable relevance for indicator development in this country. All students of indicators and indexes of economic and social well-being need to have a solid understanding of this pioneering and innovative index.

C. OECD Social Indicators

The OECD has been a pioneer in the social indicators field since the 1970s and continues to play a leading role in the development of social indicators for member countries including Canada. Indeed, it recently updated its work on social indicators with the publication *Society at a Glance* (OECD, 2001b). The OECD's motivation for developing social indicators is two-fold. First, to identify what have been the major social developments in OECD countries. Second, and more challenging, to ascertain which societal responses are effective in altering social outcomes. The OECD argues that social indicators can be used to assess whether and how the broad thrust of policy is addressing important social issues, but cannot be used to evaluate whether a particular social program is effective.

The OECD recognizes that the structure of the indicators it presents falls well short of being a full-scale framework for the collection of social statistics, but feels it is nevertheless more than a one or two dimensional listing of social indicators. The underlying structure of the indicators draws upon the pressures-state-response (PSR) framework developed by the OECD Environmental Directorate (OECD, 2000). Under this framework, human activities exert *pressures* on the environment and affect its quality and quantity of natural resources (*state*). Society responds to these changes through policies and changes in awareness and behaviour (*response*). The attraction of this framework is that it focuses on broad indicators of what government and society do (response indicators) and what they are trying to influence (state and pressure indicators).

The OECD social indicators publication follows a similar approach of dividing indicators into three categories of social context, social status and societal response. Social context variables are not usually directly the target of policy, or if they are policy objectives, only in the longer term (e.g. the proportion of the population 65 and over). These variables are neutral in terms of whether a particular outcome is good or bad. Social status variables are descriptions of social situations of highest current priority for polity action (e.g. poverty rates). Societal response variables illustrate what society is doing to affect social status variables.

The context indicators include national income, fertility rates, old-age dependency ratios, foreigners and the foreign-born population, refugees and asylum-seekers, divorce rates, and lone-parent families.

The OECD has grouped status and response social indicators into very broad policy fields based on four underlying objectives of social policy. The four fields or objectives are enhanced self-sufficiency, greater equity of outcome, improved health status, and social cohesion. The variables in each policy field are outlined below.

- The self-sufficiency indicators for social status are employment, unemployment, jobless youth, jobless households, working mothers, retirement ages and for societal responses are activation policies, spending on education, early childhood education and care, educational attainment, literacy, replacement rates and tax wedges.

- The equity indicators for social status are relative poverty, income inequality, low paid employment, and the gender wage gap and for societal response are minimum wages, public social expenditures, private social expenditures, net social expenditure, and benefit recipiency.

- The health indicators for social status are life expectancy, infant mortality, potential years of life lost, disability-free life expectancy, and accidents, and for societal response are older people in institutions, health care expenditures, responsibility for financing health care, and health infrastructure.

- The social cohesion indicators for social status are strikes, drug use and related deaths, suicide, crime, group membership, and voting and for societal response the indicator is prisoners.

The PSR framework has been widely adopted by indicator developers, including the Italian Urban Ecosystem indicators project and Finland's Indicators for Sustainable Development, which are both described in part three of this report.

The overall assessment of the OECD social indicators is very positive. The strength of the OECD framework is that it focuses on the linkages between the different social variables. These indicators were developed to assess social conditions and social policies for developed countries, and therefore are very appropriate for use in Canada.

One weakness of the approach may be that the distinction between context and status indicators may appear at times arbitrary. For example, the OECD notes that the context variables may be policy variables, but only in the long run while status variables are policy variables at all times. But the definition of the long run may vary across countries so a variable, such as the fertility rate, may be a context variable in certain countries, but a status variable in other countries. Another problem with the definition of context variables is that they are considered neutral in terms of whether a particular outcome is good or bad. Again this can be problematic as the outcome of a context variable may not be neutral for particular periods or for certain countries, while being neutral for other periods and countries.

V Canadian Frameworks for Macro-indicators

A. CSLS Index of Economic Well-being (IEWB)

Lars Osberg from Dalhousie University and Andrew Sharpe of the Centre for the Study of Living Standards have developed the Index of Economic Well-being (IEWB) for Canada where well-being depends on the level of average consumption flows, aggregate accumulation of productive stocks, inequality in the distribution of individual incomes and insecurity in the anticipation of future incomes. The weights attached to each of these components of economic well-being will vary, depending on the values of different observers. They argue that public debate would be improved if there is explicit consideration of the aspects of economic well-being obscured by average income trends and if the weights attached to these aspects were explicitly open for discussion.

The four components or dimensions of economic well-being in the IEWB are effective per capita consumption flows; net societal accumulation of stocks of productive resources; poverty and inequality; and economic security from job loss and unemployment, illness, family breakup, and poverty in old age.

The following sub-components of consumption flows are expressed in constant dollars on a per capita basis and consequently, there is no need for explicit weighting as

these dollar values represent implicit weights:

- marketed personal consumption flows, adjusted for the underground economy, the value of increased longevity, changes in family size which affect the economies of scale in household consumption, and regrettables or intermediate consumption goods (cost of commuting, household pollution abatement, auto accidents, and crime);

- government services; and

- the value of unpaid work.

The sub-components of stocks of wealth, also expressed in constant dollars on a per capita basis with no need for explicit weighting as these dollar values represent implicit weights, include:

- the net capital physical stock, including housing stocks;

- the stock of research and development;

- value of natural resources stocks;

- the stock of human capital;

- the level of foreign indebtedness; and

- the net changes in the value of the environment due to CO_2 emissions.

The following subcomponents of the inequality/poverty component of the index make use of a Rawlsian perspective that assigns greater importance to poverty than to overall inequality trends:

- income inequality, defined as the Gini coefficient for after-tax household income; and

- the intensity of poverty (incidence and depth), defined as the product of the poverty rate and the poverty gap. The poverty gap is the difference between the average income of those in poverty and the poverty line, divided by the poverty line (the poverty line is defined as one half median adjusted household income).

The subcomponents of the insecurity component are weighted by the relative importance of the specific population at risk in the total population and are based on the change over time in the economic risks associated with the following:

- unemployment, where security from the risk of unemployment is determined

by the employment/population ratio, the employment insurance coverage of the unemployed, and the benefits ratio;

- illness, where the risk of illness is modeled as the percentage of disposable income devoted to health costs;

- "widowhood" (or single female parenthood) where the risk of single parent poverty is determined by the divorce rate and poverty intensity of single parent families; and

- old age where the risk of poverty in old age is a function of the poverty intensity of the elderly population.

Trends in the index are determined by the choice of variables that are included in the index, the trends in those variables, and the weights given to them. Since the four main dimensions of economic well-being are separately identified, it is easy to conduct sensitivity analyses of the impact on perceived overall trends of different weighting of these dimensions.

The overall index of economic well-being for Canada showed no overall trend in the 1970s, rose in the 1980s to a peak of 1.1644 in 1989 (1971=1.00), and has fallen continually in the 1990s, reaching 1.0625 in 1997.

Some of the year-to-year movement in the index reflects the sensitivity to the business cycle by certain components of the index. For example, consumption flows depend on personal income, which is determined largely by demand-driven employment levels. Wealth stocks include the capital stock which is determined by cyclically-sensitive investment, and the value of natural resources, which reflects cyclical commodity prices. The two inequality measures (poverty intensity and Gini coefficients) are influenced by the state of the economy. Finally, a number of the components of the economic security index are also very sensitive to the business cycle, such as the employment population ratio.

Trends in the index are, not surprisingly, very sensitive to the weighting given the four components. When consumption flows are given a relatively high weight and the other three components relatively light weights, a different pattern emerges during certain periods. While the two indexes tracked each other in the early years of the 1970s, they diverged in mid-decade, with the index with the higher consumption weight stable and the index with the lower weight declining. From the late 1970s to the late 1980s, the indexes again tracked one another. Then in the 1990s, they diverged again, with the high-consumption-weighted index falling slightly and the high-equality and security-weighted index falling much more.

The composite Index of Economic Well-being developed by the Centre for the Study of Living Standards (CSLS), in the author's admittedly biased view,[4] produces a useful framework for focusing on the drivers of economic well-being. It thereby allows one to identify and structure the diverse variables that contribute to this well-being. While the four components can be aggregated into an overall composite index of economic well-being, the real value added of this index is that trends in these components, and specific variables, can be separately tracked and assessed.

The strength of this index is that it provides a simple yet cogent framework for organizing the variables that contribute to economic well-being. Economic research has shown that individuals value both equality and security, and, of course, that they value income (consumption). Stocks of wealth are also important because individuals care about what is passed down to future generations. A weakness of the framework, as is true for all frameworks, is that certain variables may have been omitted.

As the co-developer of the Index of Economic Well-being, the author of this report will leave to others the task of assessing the Index. In a recent survey of indexes of economic and social well-being commissioned by the French government, Gadrey and Jany-Catrice (2003:78) concluded that "Ce travail [de Osberg-Sharpe] est rapidement devenu une référence mondiale, et il a été repris dans le rapport de l'OCDE, publié en 2001, consacré au capital humain et au capital social. Il est particulièrement soigné sur le plan méthodologique."

In an evaluation of 22 indexes of economic and social well-being done by Hagerty et al (2001), the Index of Economic Well-being was ranked 3rd in terms of the evaluation criteria outlined earlier in this report.

B. Treasury Board Quality of Life Indicators

The Treasury Board has released for the last eight years an annual report on government-wide performance. The most recent report, *Canada's Performance 2002,* focuses on the quality of life of Canadians using a set of 19 societal indicators that reflect a balance between social, economic and environmental interests. These indicators have been grouped according to four themes that public opinion research has identified as mattering strongly to Canadians, namely economic opportunities and innovation; health; the environment; and strength and safety of communities.

Data are presented in disaggregated format for different regions and groups such as Aboriginal peoples. Linkages are made to the planning and performance information of federal departments and agencies that contribute to the improvement of the economy, health, the environment and communities. The Treasury Board believes that by reporting on quality of life in this manner the document sets the context for assessing the performance of federal government programs and the effectiveness of government

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[4] Others have also agreed with this assessment. See Hagerty et al (2001), OECD (2001a), and Gadrey and Jany-Catrice (2003).

policies. The report also encourages government departments and agencies to clearly link their work to improvements in the quality of life of Canadians. According to the Treasury Board, Canada is the only country in the world to publish such a report on the quality of life of its citizens.

In the economic domain the indicators are:
- real GDP per capita,
- real disposable income per capita,
- innovation, employment, literacy, and
- educational attainment.

In the health domain the indicators are:
- life expectancy,
- self-reported health status,
- infant mortality, and
- physical activity.

The environment indicators are:
- air quality,
- water quality,
- biodiversity, and
- toxic substances in the environment.

The strength and safety of communities indicators are:
- volunteerism, attitudes toward diversity,
- participation in cultural activities,
- political participation, and
- safety and security.

Of the 19 indicators, 12 are reported to have registered an improvement in the five to ten years leading up to 2002, five a deterioration (three in the healthy communities domain), and two saw no change.

The Treasury Board work is important because it represents the official view of a central agency of the Canadian government on where Canada is making progress in terms of quality of life and where we are falling behind. It is reassuring when governments acknowledge setbacks in quality of life as well as success. A second strength of the document is that it focuses on the contribution of federal government polices and programs to the quality of life of Canadians.

But the document has two weaknesses. First, the published document does not provide an analytical framework for the selection of domains and the variables in the domains for the quality of life indicators. Second, the linkages between quality of life indicators and government actions are vague and not developed. This reduces the potential contribution of the document to an assessment of the impact of government policies on the quality of life of Canadians. The document would have been much

stronger if it had adopted the PSR framework employed by the OECD for its work on social indicators.

C. Economic Gender Equality Indicators

In contrast to many sets of economic indicators, the economic gender equality indicators focusing on women's economic status across Canada, developed for the Status of Women (Federal Provincial/Territorial Ministers Responsible for the Status of Women, 1997), have a well developed analytical framework created for a specific purpose, namely to enhance understanding of the economic reality facing women.

The framework for the project determined that the indicators be developed to include the following six considerations:

- in key areas that affect women's economic autonomy including income and earnings, paid and unpaid work, and education and training;

- in time series to show trends;

- from existing data;

- for Canada and the provinces and territories;

- to reflect the situation of women with different age, education, occupation, and employment characteristics; and

- to account, in particular, for the presence of young children where possible.

Like many indicator initiatives, the economic gender equality indicators are based on individuals, oriented to social goals, a measure of outcomes, benchmarks for monitoring change, a limited set of aggregates that show the big picture, and represent work in progress. The authors of the report argue that these indicators make a valuable contribution to the field of social indicators because they:

- form a carefully selected set of indicators that reflect key aspects of economic well-being for women and men – income, work, and learning;

- include aspects of women's economic realities that are often overlooked;

- value both differences and similarities between women and men; and

- link economic and social aspects of life that have been divided historically.

The nine specific indicators advanced are: the ratio of female to male income measured on an earnings, money income, after-tax income basis; the female/male ratios

for paid, unpaid and total workloads; and the female/male ratios for university degrees granted, on the job training participation and time, and occupational returns to education for university graduates.

The economic gender equality indicators are consequently in my view an example of a Canadian indicators initiative that has used a well developed analytical framework to focus on the economic status of a particular group in order to enhance understanding of the economic reality faced by this group.

The strengths of this exercise are that the objectives are clearly defined, and the framework for approaching economic gender equality, based on income, work, and learning, is well developed. This framework is appropriate for application to other groups such as Aboriginals, visible minorities and the disabled. An overall assessment of the economic gender equality indicators is fairly positive. The project is well focused both in terms of the target population (women) and in terms of the domains and specific indicators of interest.

Part Three

Survey of Economic, Social and Labour Market Indicators and Indexes

This section of the report provides a comprehensive survey of the frameworks for the 31additional macro-indicators in the economic, social and labour market areas that have been developed throughout the world.[5] The actual values and trends of the macro-indicators are not presented. Environmental indicators have been excluded.[6] The focus of the survey is on macro-indicators at the national and international levels. Provincial/state and community indicators have been excluded except in cases where it was felt they are particularly innovative. This text draws on a number of excellent recent surveys of the burgeoning literature on macro-indicators, including Hagerty et al. (2001), OECD (2001a), Atkinson et al. (2002), Donovan and Halpern (2002), and Gadrey and Jany-Catrice (2003).

The key criterion for inclusion in this survey has been that the set of indicators or composite index is considered innovative and advances the debate. Literally hundreds of sets of indicators and composite indices on economic and social well-being have been developed throughout the world at the international, national, state/province, and community/local/municipal levels. Many of the sets of indicators and composite indexes included in this report have been developed by international organizations. These

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[5] Some of the material in this section has been updated and revised from Sharpe (1999).

[6] See OECD (2002) for a survey of environmental indicators. See Hecht (2000) for lessons learned from environmental accounting. For sets of environmental indicators see National Roundtable on the Environment and the Economy (2003), Statistics Canada (2000), Statistics Canada (2001), World Bank (1997) and OECD (1998). For composite environmental indicators see Jones, Fredricksen, and Wales (2002).

organizations have considerable resources to devote to indicator and index development and they see it as their role to identify and build on best practices in the indicators and index field at the national level.

A second criterion has been that the documentation for the sets of indicators or composite indexes is available in English or French. Finally, many sets of indicators and composite indexes of economic and social well-being developed in Canada (13 out of 37 sets of indicators and composite indexes) are included given their obvious relevance to HRDC.

According to a recent comprehensive survey of indicators research done for the French government (Gadrey and Jany-Catrice, 2003), the leading countries for serious indicators and index research and development have been the United States and Canada. The development of indicators in many major OECD countries outside North America has been lagging. For example, Gadrey and Jany-Catrice (2003:12) point out that:

> La France possède sans nul doute des institutions statistiques publiques de grande valeur, mais, dans le concert international des recherches sur d'autres indicateurs de progrès économique et social, elle souffre d'un déficit énorme de "compétitivité sociale", *au point que l'on peut dire qu'elle ne peut actuellement proposer aucun "produit exportable"*.

One United Kingdom initiative is included in this report. The United Kingdom appears to have developed few major sets of indicators and composite indexes on economic and social well-being that have garnered serious attention outside the country, at least as evidenced in major international surveys on this topic (e.g. OECD, 2001a, Hagerty et al (2001), Gadrey and Jany-Catrice, 2003, and Donovan and Helpern, 2002). Only

Macro-indicators are divided into four basic categories: economic (or at least primarily economic), social, both economic and social, and labour market. This third category reflects the reality that many macro-indicators include both economic and social variables. Within each of the four categories, macro-indicators have been broken down into sets of indicators where there is no aggregation into a composite index and those which involve the construction of a composite index.

A distinction can be made between macro and policy indicators and frameworks. Macro-indicators are the ultimate outcomes for Canadians and are used to monitor and report on three key areas: economic-labour market; skills and adult learning; and social conditions. Their relevance is over the long-term. They are used to report on different and emerging policy issues of the future. Indicators of this type examine the broader outcomes affecting the environment in which policy operates.

Policy issue indicators are diagnostic. A set of policy issue-based indicators tells us what we need to measure to know whether a policy is moving in the proper direction and whether this area remains important from a public policy perspective.

The indexes and sets of indicators in the economic, social and labour market areas described in this report are largely macro-indicators as they are not generally designed to measure the impact of a particular policy on societal welfare. It should be noted that macro-indicators and policy issue indicators are by no means mutually exclusive. Indeed many indicators such as the unemployment rate can serve as both macro indicators and policy indicators.

VI Economic Macro-indicators

A. Sets of Economic Indicators

There are many sets of economic indicators produced. This section surveys only a small number because of space considerations. The system of national accounts (SNA) produced by all countries is certainly the most important set of economic indicators produced. Estimates of GDP and its components are essential for the assessment of output and productivity performance and the conduct of macro-economic policy. The SNA framework includes expenditure, income, and industry dimensions, and is considered by some to be one of the greatest inventions of the 20th century. As it is well known, it will not be discussed in this report.

Economic indicators range from simple compendia or listings of broadly based macro-economic statistics produced by statistical agencies to comprehensive collections of indicators based on well-developed frameworks on specific issues. Examples of sets of economic indicators are the comprehensive tables produced each year by the U.S. Council of Economic Advisors (CEA, 2003) and the *OECD Economic Indicators* and *Science and Technology Indicators*.

1) The State of Working America

The Economic Policy Institute (EPI), a Washington, D.C.-based think tank, has produced biennially since 1988 *The State of Working America* (see Mishel, Bernstein, and Boushey, 2003 for the most recent edition). This document provides a very detailed and up-to-date set of economic indicators for the United States on family income, wages, jobs, wealth, and poverty from a regional, national, and international perspective. It is considered by many to be the definitive and comprehensive source of data and analysis on trends in economic well-being in the United States.

This EPI initiative has inspired attempts at developing comprehensive sets of economic indicators for the working population in other countries, including Canada (Jackson and Robinson, 2000), Britain (Gregg and Wadsworth, 1999), and Mexico.

B. Composite Economic Indicators

1) Measure of Economic Welfare (MEW)

William Nordhaus and James Tobin, two Yale University economists, developed the Measure of Economic Welfare in the early 1970s. Like the Genuine Progress Indicator (GPI) to be discussed next, the MEW uses personal consumption expenditures as a starting point. Various additions, subtractions, and imputations are made to derive a measure of total consumption deemed to generate economic welfare. All aggregation is done in terms of prices.

The authors start with a premise that GDP is not a satisfactory measure of economic welfare. The correlation of MEW to GDP and Sustainable MEW to Net National Product (NNP) were examined to determine whether the trend of per capita GDP could satisfactorily serve as an indicator of economic welfare. From the outset, the authors are clear that MEW is a measure of economic and not social welfare.

Major deductions from consumption are private instrumental expenditures (i.e. personal outlays for commuting, banking and legal services as regrettables) and private spending on health and education. Added to consumption are imputations for the value of leisure based on the opportunity cost of work, consumption, the value of non-market services such as unpaid housework, parenting, and volunteer work, and certain government consumption spending.

Nordaus and Tobin also developed a sustainable MEW where the sustainability component is the net change in the net capital stock and the growth requirement, which is the annual change in the capital stock necessary to keep pace with changes in the size of the labor force and productivity. The MEW capital stock consists of the physical capital stock, land, net foreign assets, education capital, and health capital (accumulated health spending).

Nordhaus and Tobin estimated the MEW for the United States for the 1929-65 period and concluded that there was sufficient positive correlation between changes in GDP and MEW to conclude that GDP was a reasonable barometer of changes in economic welfare. Messinger and Tarasofsky (1997) found for Canada for the 1971-94 period that both the actual and sustainable MEW advanced at a slower rate than GDP, due to the slower growth in the imputed value of unpaid work and leisure.

Actual MEW – Total Consumption

MEW, like the GPI, uses personal spending on consumer goods and services as its starting point. Various additions, subtractions and imputations are then made in deriving a measure of total consumption deemed to generate economic welfare, as outlined below.

1) Personal Consumption Expenditures are as reported in the National Income and Product Accounts

Minus

2) Private instrumental expenditures which represent personal outlays for commuting to work, banking and legal services. These expenditures are deducted as they regarded as "regrettable" contributing nothing to economic welfare.

3) Expenditures on consumer durable goods are replaced with an imputed value of services derived from the stock of consumer durable goods.

4) Private spending on health and education are deducted from the current measure of economic welfare, and are then included as part of investment expenditures.

Plus

5) Services of consumer capital is an imputed value of the services derived from the stock of consumer durable goods.

6) Value of Leisure is an imputed value of leisure time that adds to economic welfare. Its value is based on the opportunity cost of work.

7) Value of Non-Market activities represents an imputed value of services derived from unpaid housework, parenting and volunteer work.

Minus

8) Disamenity correction is a deduction for estimated higher costs of urban dwelling. The differential between rural and urban wages is used as a proxy in the original U.S. measure. In the Canadian version it was decided to use an aggregate of the urban disamenity elements that were estimated for the GPI, including cost of crime, auto accidents and pollution.

Plus

9) Government Consumption represents those elements of public current spending that are deemed to generate economic welfare. These are small representing recreation outlays and subsidies of the post office

10) Services of Government Capital is an imputed value of services to persons from the stock of public capital that generates economic welfare

Actual MEW = Total Consumption = 1 – 2 – 3 – 4 + 5 + 6 + 7 – 8 + 9 + 10

Sustainable MEW

The sustainability component of MEW is the difference between the change in the net MEW capital stock and the growth requirement, which is the annual change in capital stock necessary to keep pace with changes in the size of the labour force and then adjusted for changes in productivity.

MEW capital stock is a measure of net public and private wealth consisting of four components:

1) Net Reproducible capital representing investment in structures, machinery and equipment and inventories

2) Non-Reproducible capital consisting of the value of land and net foreign assets

3) Education capital - an estimated value of education spending invested in the labour force. An average cost per student is multiplied by the average years of educational attainment per individual in the labour force.

4) Health - accumulated public and private spending on health reduced by an annual exponential depreciation rate of 20 percent

2) Genuine Progress Indicator (GPI)

The Genuine Progress Indicator (GPI), probably the best known of the alternative indicators of economic well-being, was developed by the San Francisco-based think tank, Redefining Progress. It received massive public attention in an October 1995 article, "If GDP is up, why is America Down?" in the magazine *Atlantic Monthly.*

The GPI bears much similarity to the MEW, as both start with a measure of consumption from the national accounts and then proceed to make a large number of adjustments. The GPI has been falling in the United States since the early 1970s, largely because of the negative effect of resource depletion. The GPI can be broadly split into two blocks: a measure of current economic welfare and a measure of sustainable economic development.

Elements of current economic welfare consist of consumer spending, government spending, non-market production and leisure, and external factors. Sustainable economic development includes depletion of natural resources (non-renewable energy and farmland); net investment in produced business fixed assets; net foreign lending/borrowing; long term environmental damage ("greenhouse effect" and ozone depletion); and long term ecological damage resulting from the loss of wetlands and the harvesting of old growth forests.

Current Economic Welfare

Consumer Spending

The fundamental building block of the GPI is Consumer Expenditures on goods and services as recorded in the National Accounts. This represents approximately 60 percent of total GDP.

- Consumer spending is adjusted for changes in inequality in the distribution of personal income.

- Actual expenditures on consumer durable goods are replaced with an estimated value of services derived from the stock of consumer durable goods. This annual value of services is determined by the rate of depreciation of such goods and a rate of interest (the opportunity cost of income invested).

- Consumer spending is discounted for items that are deemed to be intermediate or defensive in nature, namely: cost of commuting – cost of traveling to and from work using either public transportation or private vehicle, as well as an estimate of time use while commuting; cost of crime and automobile accidents – costs associated with medical and legal expenses, expenditures related to lost or damaged property and spending on crime prevention (alarm systems, locks etc.); cost of family breakdown – expenses for legal fees, counseling and the establishment of separate residences, as well as an estimated cost of damage to the well being of children; and cost of household pollution abatement – expenditures on air and water filters and devices to improve air and water quality in the home.

Government Spending

Government spending recorded in GDP is all regarded as intermediate (defensive) expenditures that are required to maintain rather than enhance quality of life and hence excluded from the GPI, with one small exception, an estimated value of the services to persons generated by the stock of streets and highways.

Non-Market Production and Leisure

An estimated value of non-market production for unpaid housework, childcare and volunteer work is added to the current economic welfare components of GDP. The value of leisure is included in the sense that current economic welfare is discounted for leisure lost due to increased participation in the labour market, or more time spent on unpaid housework childcare and volunteer work.

- Value of household work and parenting is determined by the number of unpaid hours spent on household tasks such as cooking, cleaning and child care multiplied by the average hourly earning of household domestic workers.

- Value of Volunteer work represents the estimated unpaid hours multiplied by the average real wage rate.

- Loss of Leisure time is the value of lost leisure in relation to the year of greatest leisure over the estimated time period (1950-94). Hours lost are valued by the average real wage rate.

External Factors

The current measure of economic welfare is reduced by costs associated with underemployment and pollution.

- Cost of underemployment represents the gap between full-time and involuntary part-time work, measured in hours and multiplied by the average real wage rate.

- Air pollution costs are based on damage to agricultural vegetation, materials damage, cleaning, acid rain damage (forests and aquatic), reduced urban property values, and aesthetics. Costs are adjusted annually by changes in indexes of air quality.

- Water pollution adversely affects recreation, aesthetic, ecological and property values as well as the quality of household and commercial water supplies. The estimated value of these affects is adjusted annually for changes in water quality and siltation.

- An estimated value of noise pollution was made by the World Health Organization. This value is adjusted annually by changes in noise pollution based on the rate of industrialization and motor vehicle traffic.

Sustainable Economic Development

Depletion of Natural Resources

The cost of depletion of non-renewable natural resources is determined by substituting current production of non-renewable energy by a barrel equivalent of energy derived from ethanol produced from corn. The quantity of corn required to replace conventional production of non-renewable sources (mainly oil and gas) is multiplied by a price per bushel to obtain a value. The estimated price of corn is substantially higher than present values reflecting increased demand and no agricultural subsidies. The price is then assumed to rise by 3 percent per annum due to increasing real production costs.

Loss of farmland in the GPI is regarded as a conversion from capital to current income thus negatively affecting sustainable development. The value of lost farmland represents the value of farm acreage lost to urbanization plus a discounting of existing farmland as a result of deterioration in the quality of soil.

Net Investment

Net Capital Investment (produced business fixed assets) is the difference between the change in the net stock of produced fixed capital (non-residential construction and machinery and equipment) and the amount of investment required to keep the net stock of capital per worker constant.

Net International Position

Net foreign lending/borrowing is the annual change in a country's net foreign investment position.

Long Term Environmental and Ecological Damage

Costs of global warming (carbon dioxide emissions, "greenhouse effect") are linked to the current consumption of fossil fuels and nuclear power. The long-term cost is estimated by multiplying a per barrel equivalent by an arbitrary price (a tax) on current production of non-renewable energy to compensate future generations for the economic damage of global warming.

Cost of Ozone depletion is linked to world production of chlorofluorocarbons (CFC's) and other ozone-depleting chemicals. The long-term costs to health and ecological effects are determined by multiplying cumulative world production of CFC's by an arbitrary price per kilogram.

Loss of Wetland represents ecological damage valued as a product of the cumulative number of acres drained and an estimated cost per acre. Loss of Forests represents ecological damage valued as a product of the cumulative number of acres of "old growth" forests cut and an estimated cost per acre.

3) Fraser Institute Index of Living Standards (ILS)

Christopher Sarlo, an economist at Nipissing University in North Bay, Ontario, has developed for the Fraser Institute an exploratory index of living standards based on eight components (Sarlo, 1998). He has estimated it for the 1973-94 period for Canada. The eight components, each equally weighted, are: real household consumption per capita; real household income per capita; the proportion of the population not in poverty; an index of household facilities; the percentage of the population with a post-secondary degree or diploma; one minus the unemployment rate; life expectancy; and an indicator of household wealth (net worth per capita). Because of strong increases in the index for post-secondary education, household facilities, and to a lesser degree wealth, this index has outpaced both GDP per capita and the Index of Economic Well-being in the 1980s and 1990s.

4) The Global and Current Competitiveness Indexes

The World Economic Forum and the Center for International Development (2002) produce two competitiveness indexes. The first is the Growth Competitiveness Index developed by John McArthur and Jeffrey Sachs of Harvard University, and the second is the Current Competitiveness Index by Michael Porter, also of Harvard University. Both indexes are built from hard and survey data. The first index is concerned with conditions for economic growth while the second is concerned with conditions that explain current levels of GDP per capita. The two indexes are quite different and will be reviewed separately.

The Growth Competitiveness Index[7] is a weighted average of three sub-indexes that are themselves weighted averages of indicators, both objective and subjective. The subjective data is derived from a survey of business leaders from around the world. To allow for aggregation, survey data was transformed linearly to range between 1 and 7. The index is an average of the macroeconomic environment, the public institutions, and the technology sub-indexes. The first sub-index measures efficiency of the division of labour and capital accumulation. The second sub-index measures the impact of politics and bureaucracy on markets and division of labour. The third sub-index measures innovation capacity and technological diffusion.

The macroeconomic environment sub-index is a weighted average of indicators such as the inflation rate, government expenditure, recession expectations, and the country credit rating. The public institutions index is based entirely on survey data. It contains information on the independence of the judicial system, costs imposed by organized crime, and the extent of corruption, among other variables. The technology index is more complicated and its composition changes depending whether the country has a technological core economy. Countries that have technological core economies such as the United States have a technology sub-index that excludes technology transfers. This component is present in the index for non-technological core economies. The technology sub-index is composed of indicators of innovation such as patents and R&D collaboration with universities. The sub-index also contains information on Information and Communication Technology (ICT) use and cost.

The Current Competitiveness Index is not built as an average of sub-indexes created from hard and survey data, instead, it uses common factor analysis. This is a statistical method that summarizes data that accounts for common variance among variables included in the model. Current competitiveness depends on sophistication of company operations and strategy as well as the quality of the business environment. Indicators of sophistication of company operations include such variables as extent of staff training, company spending on R&D, and reliance on professional management. In total, 17 indicators of company operations are used in the index. The quality of the business environment includes a total of 50 indicators related to infrastructure, capital availability, human resources, science and technology, and related and supporting industries, as well as context for firm strategy and rivalry.

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[7] The Global Competitiveness Report which features the indexes is available in printed format and comes with a CD-ROM containing the data used in the construction of the indexes in a spreadsheet format.

VII Social Macro-indicators

A. Sets of Social Indicators

The social indicators movement started in the 1960s in the United States. It had the ambitious objective of adding a system of social accounts to the System of National Accounts.[8] This section reviews a number of attempts to develop social indicators.

1) OECD Social Indicators, 1982

The OECD has been interested in the topic of social indicators since the 1970s. It published (OECD, 1982) a list of social indicators for eight social concerns – health; education and learning; employment and quality of working life; time and leisure; command over goods and services; physical environment; social environment; and personal safety. It identified 33 specific indicators in these eight areas, which follow on the next page.

2) The German System of Social Indicators

The Centre for Survey Research and Methodology (ZUMA) in Mannheim, Germany, under the leadership of Dr. Heinz-Herbert Noll, has developed an extensive system of social indicators for Germany.[9] The aim of the German System of Social Indicators is to provide an observational grid and suitable data that allow one to monitor the status quo as well as the development of citizens' objective living conditions and their subjective quality of life. In order to attain this objective, the time series data of the indicator system describe welfare development and social change in 14 life and political domains (population, socioeconomic status and subjective class identification, labour market and working conditions, income and income distribution, consumption and supply, transportation, housing, health, education, participation, the environment, public safety and crime, leisure and media consumption, and global welfare).

The almost 400 indicators (83 in the condensed version) and over 3000 time series currently included in the German System of Social Indicators provide empirical information on changes in the living conditions of the population and on shifts in the social structure of the Federal Republic of Germany. The period of observation stretches from the beginning of the 1950s until the end of the 1990s.

The selection of indicators used is based on theoretical considerations as well as on socio-political criteria and is primarily aiming at welfare measurement. In this context, welfare refers to the objective living conditions, which determine the "individual well-being" of the population and to the connection between these objective conditions and the citizens' subjective evaluations thereof. Thus the majority of indicators currently included in the

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[8] For a history of the social indicators movement see Land (2000), Berger-Schmitt and Jankowitsch (1999), and Atkinson et al (2002:1-3). For a Canadian perspective see Henderson (1974).

[9] The website is http://www.gesis.org/en/social_monitoring/social_indicators/Data/System/keyindic.htm. This section draws on the website description of the indicators.

The OECD List of Social Indicators	
Social Concern	**Indicator**
Health	
Length of Life	Life Expectancy
	Perinatal Mortality Rate
Healthfulness of Life	Short-term Disability
	Long-term Disability
Education and Learning	
Use of Educational Facilities	Regular Education Experience
	Adult Education
Learning	Literacy Rate
Employment and Quality of Working Life	
Availability of Employment	Unemployment Rate
	Involuntary Part-time Work
	Discouraged Workers
Quality of Working Life	Average Working Hours
	Travel Time to Work
	Annual Leave
	Atypical Work Schedule
	Distribution of Earnings
	Fatal Occupational Injuries
	Work Environment Nuisances
Time and Leisure	
Use of Time	Free Time
	Free Time Activities
Command over Goods and Services	
Income	Distribution of Income
	Low Income
	Material Deprivation
Wealth	Distribution of Wealth
Physical Environment	
Housing Conditions	Indoor Dwelling Space
	Access to Outdoor Space
	Basic Amenities
Accessibility to Services	Proximity of Selected Services
Environmental Nuisances	Exposure to Air Pollutants
	Exposure to Noise
Social Environment	
Social Attachment	Suicide Rate
Personal Safety	
Exposure to Risk	Fatal Injuries
	Serious Injuries
Perceived Threat	Fear for Personal Safety

Source: Organization for Economic Cooperation and Development, 1982, The OECD List of Social Indicators (Paris: OECD), p. 13.

system measure the degree to which welfare-related social values and aims are achieved in each of the 14 domains that constitute the system.

However, it is not claimed that the system of social indicators includes all facts and conditions that are relevant to individual welfare. Nevertheless, it is assumed that the life domains selected are central to individual well-being as well as of socio-political interest. Furthermore, it should be supposed that the indicators chosen relate to actual goals of individual welfare, that they are representative for those of the population and that there is a wide consensus in politics and in society at large.

Thus the System of Social Indicators offers a database that by comparing the real state of affairs to a previous or desired one, allows an assessment of the population's current living conditions and their development over time. As a result it makes it possible to interpret the observed trends as an improvement or deterioration of the original status quo, i.e. as social progress or setback.

The System of Social Indicators is based on the Socio- Political Decision- and Indicators-System for the Federal Republic of Germany (SPES Indicator System) developed in the 1970's. For several years this system was continuously up-dated and expanded. These changes not only comprise the addition of the life domains – the environment, public safety and crime, leisure and media consumption and global welfare", but also further fundamental modifications and developments. In this context the systematic inclusion of components to measure subjective well-being and of indicators for the perceived quality of life are especially noteworthy.

3) Putnam's Indicators of Social Capital

In 2000, Robert Putnam, a political scientist from Harvard University, published his seminal study of social capital, *Bowling Alone: The Collapse and Revival of American Community*. To provide evidence for his thesis that social capital is in decline in the United States, he included a large section of trends in measures of civic engagement and social capital. Putnam's social capital indicators include:

- political participation as represented by presidential voting, political organizations with regular paid staff, citizen participation in campaign activities, and civic engagement in partisan and community activities, and public expression;

- civic participation as represented by the number of non-profit organizations, membership rates, trends in the PTA, active organizational involvement, and club meeting attendance;

- religious participation as represented by church membership and attendance;

- connections in the workplace as represented by union membership and professional association membership;

- informal social connections as represented by frequency of social visiting, family dinners, card playing and other leisure activities, neighbouring, informal socializing, fitness, bowling leagues, and spectator sports;

- altruism, volunteering and philanthropy as represented by philanthropic generosity, church and community giving, charitable giving, and volunteering and community projects;

- reciprocity, honesty and trust as represented by perceptions of honesty and morality, trust, observance of stop signs, crime rates, and employment in policing and the law; and

- small groups, social movements and the net as represented by environmental organizations, initiatives on statewide ballots, and long-distance phone calls and letters.

4) Oregon Benchmarks

One of the best-known community indicator projects is the Oregon Benchmarks[10], produced by the Oregon Progress Board. This organization is an independent state planning and oversight agency. Created by the legislature in 1989 to keep Oregon focused on the future, the board is responsible for implementing the state's 20-year strategic plan, Oregon Shines. The nine-member panel, chaired by the governor, is made up of citizen leaders and reflects the state's social, ethnic and political diversity.

The Progress Board focuses Oregon's institutions on outcomes that support the overall goals of Oregon Shines, namely quality jobs for all Oregonians; safe, caring and engaged communities; and healthy, sustainable surroundings. According to Beverly Stein, a member of the Oregon Progress Board, the key features of the benchmarks are accountability, long-term thinking, and impetus for collaboration (Stein, 1996:10).

The Progress Board tracks these outcomes through 92 indicators known as the Oregon Benchmarks. The Benchmarks are divided into seven categories – economy, education, civic engagement, social support, public safety, community development, and environment. Specific indicators include K-12 student achievement, per capita income, air quality, crime rates, employment, and infant health. Twenty-two "priority" benchmarks are considered deserving of special attention.

The Progress Board is a catalyst for change. It gathers and distributes data on the benchmarks. It encourages state and local government agencies, businesses, and

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[10] The Oregon Progress Board website (www.econ.state.or.us/OPB) provides detailed information on the Oregon benchmarks. See the appendix for both historical data and performance targets for 2000 and 2010 and grades for how "on track" the state is in achieving the 2000 targets. Also see Popovich (1996) for an historical look at the development of the Oregon benchmark project and Stein (1996) for an overview of Oregon benchmarks.

nonprofit and citizen groups to use the Benchmarks in their planning and reporting. And it assists its Oregon partners in developing their own benchmarks and creating programs that support meeting Benchmark targets. Both Oregon Shines and the Benchmarks were created with extensive citizen involvement.

Every other year since 1991, the Progress Board has issued an Oregon benchmarks report, tracking Oregon's success in achieving the benchmarks. In December 1996, the Progress Board issued a new Oregon's Benchmark Performance Report, followed in January 1997 by Oregon Shines II, a complete update of the original strategic plan.

The six-phase process used by the Oregon Progress Board for the development of benchmarks is outlined below.

1) Review the goal and make sure it is realistic (or sufficiently ambitious). Examine Oregon's current level and historic trends and comparisons with other states and nations.

2) If possible, identify the payoffs from achieving this goal in terms of, for example, reduced costs for future budgets; improved lives for Oregonians; and improved productivity.

3) Examine recent efforts to address this problem, including programs and budgets, both by the state and other entities; key players; successes and setbacks; and strategies already developed to achieve these goals.

4) Examine the best practices from other states, and especially, from around the world.

5) Propose a strategy to accomplish this goal, including programs, organizational change, incentives, and budgets.

6) Summarize what it will take to achieve the goal.

B. Composite Social Indicators

1) Fordham Index of Social Health

Marc Miringoff and Marque-Luisa Miringoff (1999) of the Institute for Innovation in Social Policy of Fordham University have developed an index of social health that attempts to monitor the well-being of social well-being in the United States by examining the progress on a number of social problems cumulatively over time. The Fordham Index of Social Health (ISH) composite index is said to track the nation's social performance.

A set of socio-economic indicators, covering 16 social issues dealing with health, mortality, inequality and access to services, was selected to cover all stages of life, with

separate indicators for each age group. It is argued this approach is useful because age groups are universal, with everyone potentially passing through all age groups; age groups are conceptually integrated across components, creating a holistic framework; age groups highlight several important contemporary trends, such as deteriorating status of children and improved status of the elderly; and age groups are readily understood by the public.

Five of the indicators apply to all age groups – homicides, alcohol-related fatalities, food-stamp coverage, access to affordable housing, and the gap between the rich and poor. Three of the indicators apply to children – infant mortality, child abuse, and child poverty; to youth – teen suicides, drug abuse, and high school drop-outs; and to adults – unemployment, average weekly earnings, and health insurance coverage. Two indicators apply to the elderly – poverty of persons over 65 and out-of-pocket health costs for the elderly.

The index employs the construct of a Model Year to provide a standard of performance, combining the best achievements in all 16 areas. Annual performance is measured against best past performance rather than an ideal standard. To standardize, each indicator is measured in comparison to its best and worst performance over the period, with the best performance scored at 10 and the worst a zero. All other observations are scored within the 0-10 scale.

The ISH in the United States reached its peak in 1973, then declined rapidly to 1982 and has since leveled off.

Brinks and Zeesman (1997) have estimated the ISH for Canada for the 1970-94 period, with minor changes to the index (the proportion of the population with no health insurance was dropped given universal health coverage in Canada and the food stamp indicator was replaced with the number of social assistance beneficiaries). It was found that the index increased in the 1970s, then fell sharply between 1980 and 1983, stabilized and fell again after1989 for two years and then stabilized.

2) Diener Quality of Life Index

Ed Diener (1995), a psychologist at the University of Illinois at Urbana-Champaign, has developed an index of the quality of life (QOL) based on a universal set of values. He constructs two indexes, one called the Basic QOL Index, which is particularly relevant for developing countries and the Advanced QOL Index for developed countries. He estimates both indexes for 77 countries and also calculates a combined index, which brings together the basic and advanced indexes. The Basic QOL Index includes seven variables: purchasing power, homicide rate, fulfillment of basic needs, suicide rate, literacy rate, gross human rights violations, and deforestation. The Advanced QOL Index also includes seven variables: physicians per capita, savings rate, per capita income, subjective well-being, college enrollment rate, income inequality, and environmental treaties signed. According to Diener, combining the two indices produces a reliable measure of QOL that systematically covers diverse human values.

Diener makes use of a set of 45 universal values across all cultures reflecting three universal requirements of human existence: meeting biological needs, coordinating social interaction, and the survival and welfare needs of groups. The 45 values are in turn organized into seven sets of similar values. The sets of values and the variables used to capture each value in the basic index for developing countries and the advanced index for developed countries are given in the following table.

Variable by Value Region for the Basic and Advanced QOL Index		
Value Region	**Basic Index**	**Advanced Index**
Mastery	basic physical need fulfillment	physicians per capita
Affective autonomy	suicide rate	subjective well-being
Intellectual autonomy	literacy rate	university attendance
Egalitarian commitment	gross human rights violations	income inequality
Harmony	deforestation	environmental treaties
Conservatism	homicide rate	savings rate
Hierarchy	purchasing power parity	per capita income

3) Index of Social Progress

Richard J. Estes (1997) from the University of Pennsylvania has developed an Index of Social Progress (ISP) for the purpose of identifying significant changes in "adequacy of social provision" and to assess the progress in providing more adequately for the basic social and material needs of the world's population. The ISP consists of 46 social indicators that have been subdivided into 10 sub-indexes: education, health status, women status, defense effort, economic, demography, geography, political participation, cultural diversity, and welfare effort. All 46 indicators are known to be valid indicators of social development.

The weights used to construct the index are derived through a two-stage varimax factor analysis in which each indicator and sub-index is analyzed for its relative contribution toward explaining the variance associated with changes in social progress over time. Standardized sub-index scores are then multiplied by the factor loadings to create weighted sub-index scores and the Composite Weighted Index of Social Progress (WISP) scores are obtained through a summation of the weighted sub-index scores.

Estes argues that the WISP is a more comprehensive, valid, reliable instrument for assessing changes in social development over time than other indices on national and international progress like GDP and the HDI. Estes (1997) has provided estimates for 124 countries for 1970, 1980, and 1990.

Index of Social Progress, Indicators by Sub Index

I. Educational Sub Index (N=6)

Percent Age Group Enrolled, Primary Level (+)
Percent Grade 1 Enrollment Completing Primary School (+)
Percent Age Group Enrolled, Secondary Level (+)
Percent Age Group Enrolled, Tertiary Level (+)
Percent Adult Illiteracy (-)
Percent GNP in Education (+)

II. Health Status Sub Index (N=7)

Life Expectation at 1 Year (+)
Rate Infant Mortality Per 1000 Liveborn (-)
Under 5 Years of Age Child Mortality Rate (-)
Population in Thousands per Physician (-)
Per Capita Daily Calorie Supply as % of Requirement (+)
Percent Children Fully Immunized at Age 1, DPT (+)
Percent Children Fully Immunized at Age 1, Measles (+)

III. Women Status Sub Index (N=6)

Female Life Expectation at Birth (+)
Female Adult Literacy Rate (+)
Percent Married Women Using Contraception (+)
Maternal Mortality Rate per 10000 Live Births (-)
Female Primary School Enrollment as percent of Males (+)
Female Secondary School Enrollment as percent of Males (+)

IV. Defense Effort Sub Index (N=1

Military Expenditures as Percent of GDP (-)

V. Economic Sub Index (N=6)

Per Capita Gross National Product in dollars (+)
Real Gross Domestic Product per Head (+)
GNP per Capita Annual Growth Rate (+)
Average Annual Rate of Inflation (-)
Per Capita Food Production Index (+)
External Public Debt as Percent of GDP (-)

VI. Demography Sub Index (N=6)

Total Population Millions (-)
Crude Birth Rate Per 1000 Population (-)
Rate of Population Increase (-)
Percent of Population under 15 Years (-)
Percent of Population over 60 Years (+)

VII. Geographical Sub Index (N=3)

Percent Arable Land Mass (+)
Natural Disaster Vulnerability Index (-)
Average Annual Deaths From Natural Disasters Per Million Population (-)

VIII. Political Participation Sub Index (N=3)
Violations of Political Rights Index (-)   Violations of Civil Liberties Index (-)   Composite Human Suffering Index (-)
IX. Cultural Diversity Sub Index (N=5)
Largest Percent Sharing Same Mother Tongue (+)   Largest Percent Sharing Same Basic Religious Beliefs (+)   Largest Percent Sharing Same or Similar Racial/Ethnic Origins (+)
X. Welfare Effort Sub Index (N=5)
Years Since First Law-Old Age, Invalidity, Death (+)   Years Since First Law-Sickness & Maternity (+)   Years Since First Law-Work Injury (+)   Years Since First Law-Unemployment (+)   Years Since First Law-Family Allowances (+)

Source: Estes (1997)

4) Ontario Social Development Council Quality of Life Index

Malcolm Shookner (1998) of the Ontario Social Development Council has developed a community-based Quality of Life Index (QLI) for Ontario. Based on an extensive review of literature on quality of life, the author found the following.

- The overall level of health attained by Canadians is an important measure of the success of our society. Good health enables individuals to lead productive and fulfilling lives. For the country as a whole, a high level of health contributes to increased prosperity and overall social stability.

- Our overall high standard of health is not shared equally by all sectors in Canadian society. There are differences in health status by age, sex, level of income, education, and geographic area. The rich are healthier than the middle class, who are in turn healthier than the poor. The well-educated are healthier than the less educated, and the employed are healthier than the unemployed.

- Quality of life provides a conceptual framework, consistent with sustainable human development and determinants of health, for the interdependence of social, health, economic and environmental conditions in communities.

- A composite index including key indicators of social, health, economic and environmental conditions can contribute to progress toward improving our quality of life and becoming a more sustainable society.

- The QLI should have the capability to be future oriented and predict the direction of trends.

- Local development allows us to create the conditions that will enable citizens to gain more control over their quality of life.

- If the QLI is to have broad public credibility, it must be careful to include both positive and negative measures to provide a balanced perspective on quality of life.

- By creating a summary "quality of life" index, some type of standardization would emerge that would enable people to compare local outcomes across the country.

- A core set of indicators is needed for comparative reporting by municipalities.

- Criteria for selecting a final set of indicators must be clearly stated.

- Communities must be involved in the selection and analysis of indicators.

- A quality of life/sustainability report should evaluate whether the indicator results are showing progress towards or away from desirable goals. It should also suggest how or whether the indicators could be improved, and may contain recommendations about the kinds of policies or programs that are needed to make progress towards the community's goals.

- Assessment of indicator performance should be carried out periodically.

Using the findings from the literature review, the Ontario Social Development Council developed, with input from community groups, an index of Quality of Life for Ontario. The purpose of the QLI was to provide a tool for community development which could be used to monitor key indicators that encompass the social, health, environmental and economic dimensions of the quality of life. The following indicators were included in the Quality of Life Index:

Social Indicator: Children in care of Children's Aid Societies; social assistance recipients; public housing waiting lists;

Health Indicator: Low birth weight babies; elderly waiting for placement in long term care facilities; suicide rates;

Economic Indicator: Number of people unemployed; number of people working; bankruptcies; and

Environmental Indicator: Hours of poor air quality; environmental spills; tonnes diverted from landfill to blue boxes.

The QLI can be used to comment frequently on key issues that affect people and contribute to the public debate about how to improve the quality of life in our

communities and province. Shookner found that the quality of life has declined in Ontario since 1990. A closer look at the twelve indicators reveals progress in some areas and setbacks in others.

5) Ottawa Social Planning Council Quality of Life Index

The Social Planning Council of Ottawa has developed an index of quality of life for the Ottawa-Carleton region (Social Planning Council of Ottawa-Carleton, 1999) that covers four general areas of quality of life: health, economic, social, and environmental fields and is composed of 12 equally weighted indicators, three in each area. The indicators are:

Health Field: low birth-weight babies, long-term care waiting lists, and new cancer cases;

Economic Field: the unemployment rate, the employment rate, and bankruptcies;

Social Field: social assistance recipients, children admitted to the Children's Aid Society, and public housing waiting lists; and

Environmental Field: air quality, toxic spills, and blue-box recycling.

The overall index increased 2 percent between 1990 and 1999 because of a large increase in quality of life as expressed by the sub-index for environmental indicators. All three other components of the index experienced falls over the 1990-99 period, with the sub-index for social indicators down 50 per cent, but the nearly doubling in the index for environmental indicators more than offset the declines in these three areas.

VIII Economic/Social Macro-indicators

A. Sets of Economic/Social Indicators

1) World Development Indicators (WDI)

World Development Indicators (WDI) is a publication from the World Bank that regroups data on various development indicators for most countries of the world. It uses numerous sources since development is a broad topic that deals with a variety of subjects from economic growth to environment protection. The sources are international organizations, including United Nations agencies. The WDI is available in a printed or electronic (online or CD-ROM) format.[11] The WDI is divided into six sections.

The first section presents summary tables on development indicators that are in subsequent sections to provide an overview of development in the world. The second section contains demographic, labour market, poverty, inequality, health and education

[11] Free sample data are available from the World Bank website at http://www.worldbank.org/data/.

indicators. The third section contains data on agriculture and land use, deforestation, air and water pollution, energy and urbanization. The fourth section is concerned with economic activity and presents tables on growth and structure of output, international trade, government finance, price indicators and external debt. The fifth section provides data on the relation between markets and the State. Among the various indicators included in this section are data on stock markets and investment regulation, tax policies, state-owned enterprises and science and technology. The sixth and final section deals with globalization and presents data on financial flows, trade barriers, development assistance and aid, as well as travel and tourism. Besides tables, each section offers charts and boxes on specific countries and/or indicators.

2) CPRN Quality of Life Indicators

The Canadian Policy Research Networks (CPRN), a not-for-profit think tank, has produced a set of Quality of Life indicators for Canada. The purpose was to go beyond simple economic indicators of well-being such as GDP and present indicators of what matters to Canadians. These indicators also allow the tracking of changes in the different aspects of quality of life over time. The CPRN (2002) produced what it calls a Citizens' Report Card of quality of life that assigns scores to the various indicators, showing change (better or worse) or absence of change. The indicators, which may be quantitative as well as qualitative, are organized under nine domains: Democratic Rights and Participation, Health, Education/Learning, Environment, Social Programs and Conditions, Community, Personal Well-being, Economy and Employment, and Government.

The target audience for the Quality of Life project is broad and includes citizens, policy makers, business and media. Those who prepared the report card are also of various backgrounds, including researchers, academics and citizens. Discussion of policy issues from both the point of view of citizens and experts is the aim of the project.

3) Conference Board Performance and Potential

Since 1996 the Conference Board of Canada has published an annual report entitled *Performance and Potential.* The seventh report, subtitled *Canada 2010: Challenges and Choices at Home and Abroad*, and released in October 2002, benchmarks Canada's socio-economic performance against 24 OECD countries for 95 variables in six categories: the economy (10 indicators), innovation (14), environment (15), education and skills (17), health (25), and society (14).

The Conference Board framework uses a combination of different methods. An overall index is created for each category to determine the top 12 out of 24 performers. A suite of indicators is used in each of the six categories. The ranking method combines both relative (i.e. gold (top 4 countries), silver (top 5th to 8th), and bronze (top 9th to 12th)) and ordinal (counting the number of medals) methods for comparison purposes.

Canada turned a solid performance, winning six silver medals, three bronze medals, but no gold medals. Our success was broadly based. We were the only country to finish in the top 12 performers in all six categories out of the 24 countries.

4) Calvert-Henderson Quality of Life Indicators

In 2000, the Calvert Group, in collaboration with the futurist Hazel Henderson, released the Calvert-Henderson Quality of Life Indicators, billed as "the first national, comprehensive assessment of quality of life in the United States using the systems approach." The purpose of the exercise is to paint a broad picture of quality of life to complement current statistics and to identify statistical "blind spots" where new data collection is needed. The authors (Henderson, Lickerman, and Flynn, 2000) hope that the indicators will be used to educate the public, broaden the debate about quality of life, hold governments and business accountable, and clarify the multiple decisions individuals make in their work, education, leisure and civic commitments.

According to the authors, the Calvert-Henderson QOL Indicators "provide a methodology for organizing, synthesizing, and analyzing myriad statistics in ways that allow the bytes of data to be transformed into meaningful indicators to help citizens understand and influence complex socio-economic phenomena." They argue that the approach is unique in several ways.

- First, the approach was designed and implemented by a multi-disciplinary group of 15 researchers and practitioners with expertise in the indicators field.

- Second, the indicators unbundle central social, economic, and environmental issues into 12 distinctive domains of quality of life (education, employment, energy, environment, health, human rights, income, infrastructure, national security, public safety, recreation, and shelter), in contrast to "green GDP" approaches that collapse all elements into a single composite index.

- Third, all the indicators identify interfaces with other domains, allowing a systematic overview of society often concealed by aggregation of traditional indices.

- Fourth, a model is developed for each indicator that serves as a frame through which the underlying phenomena can be clearly organized, examined, and understood. The model outlines and prioritizes key concepts and relationships that are central to understanding each domain.

5) B.C. Statistics Project on Regional Indicators

British Columbia (B.C.) Statistics has developed an index incorporating socio-economic indicators for 28 regions in the province. The B.C. Deputy Ministers' Committee on Social Policy commissioned this study, which develops indicators for the

Regional Districts of British Columbia, which range in size from 2 million down to 1,500.

Seven basic indicators have been developed, each with three or four variables. These indicators (with the weights given them in brackets) are economic hardship (0.25), impending change in economic hardship (0.05), crime (0.2), health (0.2), education (0.2), children (0.05), and youth (0.05).

- The economic hardship index is currently based on the proportion of the population aged 0-64 receiving social assistance for less than one year, the proportion of the population aged 0-64 receiving social assistance for over one year, and the proportion of the senior population receiving the Guaranteed Income Supplement. Additional hardship indicators that may be added include proportion of the population that is the working poor, income inequality measures, the proportion of the population receiving Employment Insurance (EI), per capita income, and per capita net taxes paid.

- The impending change in economic hardship is based on the annual percentage change in the number of social assistance recipients, the annual percentage change in the number of EI beneficiaries, and income dependency on forestry, fishing and mining.

- The crime index is based on the change in the overall crime code rate, the property crime rate, and the violent crime rate. Data on spousal assaults, drug offences, and young offenders may be added.

- The health index is based on three indicators: the potential years of life lost due to natural causes, the potential years of life lost due to accidental causes, and the potential years of life lost due to suicide/homicide. Data on teen pregnancy, infant mortality, and incidence of smoking may be added.

- The education index is based on the proportion of the population aged 25-54 with completed post-secondary education, the high school completion rate, the pass rate for Grade 12 math, the pass rate for Grade 12 English, and career preparation enrolment. Data on average test scores may be added.

- The children at risk index is based on the proportion of the population under 19 living in families on social assistance, infant mortality, and average test scores for reading. Data may be added on young offenders, teen pregnancies, test scores for math, the proportion of the youth population in care, and the proportion of the population reporting child abuse.

- The youth at risk index is based on the proportion of the population aged 19-24 on social assistance, and the high school completion rate. Data may be added on the incidence of youth who smoke, the youth motor vehicle death rate, youth drug offence rate, youth net migration, and youth EI incidence rate.

All variables are given an index value between 0 and 100, with the best-off region given 0 and the worst off 100. The weights are then used to compute a composite index or index of regional stress given the values for the seven indexes.

6) Newfoundland Community Accounts

In order to provide information to policy makers and analysts about well-being of citizens, with the objective of making Newfoundlanders a self-reliant and prosperous people and Newfoundland a sustainable region, the Newfoundland government has developed a system of community accounts. They contain data and indicators[12] grouped into ten fields: social, health, demographic, environmental, resources/wealth, production, labour market, education, income, and consumption accounts.

7) Federation of Municipalities Quality of Life Reporting System

The Federation of Canadian Municipalities (FCM), in cooperation with 16 large urban governments, has recently developed a reporting system for monitoring the quality of life in major Canadian cities. While not a QOL index per se, the system provides much useful information on societal indicators. It develops QOL measures in seven areas: population resources, community affordability, quality of employment, quality of housing, community stress, community health, community safety, and community participation. The list of variables used to capture trends in each QOL measure is given on the following page.

The FCM Quality of Life Reporting System was born out of a desire to bring a community-based perspective to the development of public policy and to monitor the consequences of changing demographics, as well as shifting responsibilities and fiscal arrangements.

The QOL monitoring system attempts to include both subjective/qualitative indicators and objective/quantitative indicators. The public consultations that guided the development of the indicators provided some qualitative information, but more extensive qualitative measurements will be done in the future. The first report largely focuses on establishing baseline quantitative measures.

The criteria for selection of variables (see the next page) for the monitoring system were the following: 1) meaningful at the community level; 2) annual availability at a national-consistent level; and 3) easily understood by the public.

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[12] The indicators are available on-line (www.communityaccounts.ca) for various levels of geographic aggregations, from communities to the province as a whole.

Illustration of the Quality of Life (QOL) Template for Federation of Canadian Municipalities

Population Resources	Community Affordability	Quality of Employment	Quality of Housing	Community Stress	Health of Community	Community Safety	Community Participation
Population age groups	CAM1	Employment and unemployment rates	Median income compared with median house cost	% lone-parent families	Infant mortality	Young offender charges per 100,000 residents	Voter turnout
Population growth	CAM2	Permanent, temporary and self-employment as a % of population	Rental affordability: % renters paying 30% or more of income for rent	% of families that are low-income	Low birth weight babies	Violent crimes per 100,000 residents	Charitable donations
Multi-culturalism immigrant and visible minority populations	Patterns of change in family incomes	Families receiving Employment Insurance or Social Assistance as % of all taxfilers	Median rental as % of median income	Teen births per 1,000 teen women	Premature mortality	Property crimes per 100,000 residents	United Way contributions per resident
Migration: internal and external	Public transport: cost as % of minimum wage	Median hourly wages by gender and age	Substandard dwellings: % of houses needing major repair	Suicide rates per 100,000 residents	Hospital discharges	Fear to walk in neighbourhood*	Daily newspaper circulation
Labour force replacement ratios	Government transfer income by source	Long-term unemployment	Residential property tax revenues per resident	Homelessness; children in care; crisis calls*	Work hours lost due to illness or disability	Injuries and poisonings per 100,000 residents	Recycling, kg per resident, per year
Education levels		Employment income as % of all income	Real estate sales per resident	Personal and business bankruptcies			
Literacy							

8) UK's National Indicators of Sustainable Development

In December 1999 the UK government published a core set of about 150 indicators of sustainable development to be used to monitor national progress. These indicators underpin the UK government document *A better quality of life*: *a strategy for sustainable development in the UK* (May 1999).

The UK strategy for sustainable development has four main aims. These are:
- social progress which recognizes the needs of everyone;
- effective protection of the environment;
- prudent use of natural resources; and
- maintenance of high and stable levels of economic growth and employment.

For the UK, priorities for the future are:
- more investment in people and equipment for a competitive economy;
- reducing the level of social exclusion;
- promoting a transport system which provides choice, and also minimizes environmental harm and reduces congestion;
- improving the larger towns and cities to make them better places to live and work;
- directing development and promoting agricultural practices to protect and enhance the countryside and wildlife;
- improving energy efficiency and tackling waste;
- working with others to achieve sustainable development internationally.

Government policy is to take account of ten guiding principles:
- getting people at the centre;
- taking a long term perspective;
- taking account of costs and benefits;
- creating an open and supportive economic system;
- combating poverty and social exclusion;
- respecting environmental limits;
- the precautionary principle;
- using scientific knowledge;
- transparency, information, participation and access to justice; and making the polluter pay.

The UK government has developed a way of measuring progress by a system of indicators. Headline indicators identify the key issues relating to quality of life at the national level and are published every year. The 15 headline indicators are intended to raise public awareness of sustainable development, to focus public attention on what sustainable development means, and to give a broad overview of progress. These 15 indicators cover the three pillars of sustainable development (with the indicators in brackets): Economic growth (output, investment, and employment), Social progress (poverty and social exclusion, education, health, housing, and crime), and Environmental

protection (climate change, air quality, road traffic, river water quality, wildlife, land use, and waste). In addition to the national headline indicators, regional and local indicators are published.

9) Finland's Indicators for Sustainable Development

The development of indicators for sustainable development was initiated at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992. It was recognized that methods needed to be developed to ensure that improvements to sustainable development in different sectors are at all times based on up-to-date, reliable, and usable information. To achieve this goal, the UN Commission on Sustainable Development started development of indicators in 1995. Finland took part in the testing of the UN indicators during 1996-99. Results showed that UN indicators were not all suitable as such for measuring sustainable development in Finland. For this reason it was deemed essential to develop indicators better adapted to Finnish conditions in addition to those chosen directly from the UN list.

Finland has since developed a comprehensive set of sustainable development indicators that include variables in the economic and social/cultural domains as well as the environmental domain. The variables in each domain follow.[13]

The OECD's 'pressure-state-response' framework, described earlier in this report, was used in the development of Finland's indicators for sustainable development. Indicators on the 'pressures' (emissions, consumption, health risks) and the 'state' (concentrations, amounts) are widely available, but the community's response, i.e. indicators on measures taken, – the 'reactions' – are harder to define. For example, social service and health care expenditures do not necessarily lead to increased well-being.

Variables in Finland's Indicators for Sustainable Development	
Ecological Issues	
1. Climate change	Greenhouse gas emissions Finland's mean temperature Ice break-up date of the river Tornio
2. Ozone layer depletion	Importation of ozone layer-depleting substances Stratospheric ozone above Finland
3. Acidification	Acidifying emissions Exceeding the critical sulphur load
4. Eutrophication	Nutrient discharges The nutrient balance Water quality Algae levels
5. Biodiversity	Numbers of threatened species Population trends in farmland and forest birds

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[13] Details are posted at http://www.vyh.fi/eng/environ/sustdev/indicat/.

	Numbers of grey seals Area of nature reserves Implementation of nature conservation programmes
6. Toxic contamination	Emissions of volatile organic compounds Mercury emissions Pesticide sales PCB levels on Baltic herrings Dioxin levels in breast milk
Economical Issues	
7. Economic development	Gross Domestic Product Current account surplus State financial assets and liabilities Inflation
8. Environmental policy instruments	Environmentally-related taxes and fees Environmental protection expenditure Taxes per carbon dioxide content of fuels EMAS registrations and environmental certificates
9. Natural resources	Forest age structure Annual forest increment and drain Cultivated and fallow land Reindeer numbers Commercial fisheries Fish farm production
10. Community structure and transport	Urban land area and the urban population Urban population densities Average commuting distance Car numbers and use Trends in car and public transport use Air quality in cities
11. Production and consumption	Total energy consumption Energy use Total consumption of natural resources Water consumption Holiday air travel Household consumer spending Generation of waste Waste delivered at landfills Recovery of packaging materials
Social and Cultural Issues	
12. Demographic developments	Annual population changes Dependency ratio Life expectancy Internal migration
13. Lifestyles and illnesses	Daily smokers Obesity Alcohol and drug-related illnesses HIV infections Suicides
14. The workforce	Unemployment levels and rate of employment

	Long-term unemployment Occupational accidents Retirement age and disability pensions
15. Social problems and equality issues	Incidence of poverty Income level differences The homeless Women's earnings relative to men's Relocated children Violent crime
16. Education, research and participation	Education levels Research and development expenditure Young people neither studying nor working Voter turnout
17. Access to information	Newspaper circulations Library loans Internet users
18. Cultural heritage	Meadows and pastures Visits to museums Age structure of buildings
19. Ethnic minorities	Classes taught in Saame Immigrant unemployment rate
20. Development co-operation	Official development aid Development aid to regions near Finland

10) Italian Urban Ecosystem Report

Italy's best known set of indicators is the Urban Ecosystem report. It is an environmental report that ranks 103 Italian cities. It has been developed and carried out every year since 1994 by Legambiente (the most widespread environmental Italian NGO), Istituto Ambiente Italia (one of the principal independent Italian research centres) and the involved municipalities. The survey results are widely diffused in Italian newspapers and TV, both in national and local reports.

The selected indicators aim to evaluate urban sustainability rather than the environmental "urban quality." The project weaves together both environmental data and socio-economic variables (from per capita income through industrial intensity and cultural consumption). The Urban Ecosystem is used to evaluate local environmental policies, and to highlight the environmental pressures. The 18 environmental sustainability indicators[14] were selected through a balanced P-S-R (pressure-state-response) approach. For each indicator an appropriate sustainability target was defined and a specific performance scale determined. For some indicators (eg: public transport)

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[14] The 18 environmental indicators are air monitoring, NO_2, CO, water consumption, nitrates, sewage treatment, production of urban solid waste, waste recycling, public transport, pedestrian areas, bike paths, circulating cars, household GWh, fuel consumption, tumour and respiratory death rate, ISO 14000 certified industries, and commitment to local Agenda 21.

small and big cities are evaluated differently, taking into account the "size factor". In the most recent survey different weights for indicators were also used, developed by a panel composed by local authorities and NGO experts.

This project has illustrated the importance of having indicators at the local scale to highlight failures and successes, identify trends and geographical differences, and to establish correlations between environmental performance and various urban "forms and models", such as metropolises, small to medium-sized cities, etc. This system of urban environmental indicators has been used as a tool in support of national policies in different areas.

B. Composite Economic/Social Indicators

1) CCSD Index of Personal Security

The Canadian Council of Social Development (CCSD) has produced since 1999 an Index of Personal Security[15]. The Personal Security Index is composed of indicators that reflect two key components of personal security: economic security and physical security. The index is a weighted average of objective and subjective indicators of both types of security.

Four domains of economic security are covered by the index.

- The first domain is the level and adequacy of income, which deals with the capacity of Canadians to afford the basics of life (food, shelter, clothing, education and health care). The CCSD selected disposable income per capita and the poverty gap as objective indicators of this domain.
- The second domain is employment security, which is defined as the capacity to access jobs and earnings. The CCSD uses the long-term unemployment rate as the objective indicator of employment security.
- The third domain of economic security is the extent of the social safety net. The CCSD considers the most common form of adversity to be the loss of job. Therefore, the percentage of unemployed Canadians receiving employment insurance (EI) benefits is the objective indicator for this domain. For those unemployed that do not receive EI, the CCSD uses the benefits received by lone-parent families with one child in large cities.
- The last domain of economic security is financial vulnerability, or how long could Canadians live without other income than their savings. The vulnerability comes from the exposure to debt and debt service. The objective indicator used by the CCSD is the total mortgage and consumer debt to disposable income ratio.

The physical security component of the Personal Security Index has three domains.

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[15] The full versions of each year's Personal Security Indexes are available free of charge online at http://www.ccsd.ca/pubs/pubcat/index.htm.

- The first one is physical and mental well-being, which deals with safety at home and in the workplace. The CCSD uses two objective indicators which are the incidence of workplace injuries and the motor vehicle accident injury rate.
- The second domain is access to health services, which relates to the availability of health care when needed. The indicator the CCSD uses to measure health services accessibility is the potential years lost, i.e. the ratio of total years lost before the age of 75 and the population under age 75.
- The third and last domain of physical security is physical safety, or security from violent crime and theft. The CCSD does not use any objective indicator for this domain.

The CCSD uses subjective indicators of economic and physical security derived from the survey it conducts. Respondents are asked about the adequacy of their household income, the likeliness of job loss or employment, and the adequacy of government support. Respondents to the CCSD survey are also asked about their state of health, exposure to violent crime, property crime, stress level, support of family and friends in case of illness. Finally, respondents are asked to choose which source of security is most important: economic security (sufficient income, job security), health security (being healthy, access to health care), or physical security (feeling safe from violent or property crime). The answers to this last question are used to derive the weights used to assemble the Personal Security Index from the indicators.

2) Atlas of Canada

Natural Resources Canada is presently constructing an electronic Atlas of Canada that will allow users to access easily socio-economic indicators by region. Canada and its regions will be seen with four different maps:
- the first map will provide information on the physical environment;
- the second on the social environment;
- the third on the economic environment; and
- the last will combine all the information.

The indicators on the physical environment map will be related to four domains, which are environment quality, security, housing and accessibility. Social environment indicators will provide information on leisure and recreation, opportunity, participation, education, stability, health resources and health status. Indicators of household finance, and work and employment will describe the economic environment.

The indicators are constructed using an additive standard score methodology in order to combine variables into indexes. The level of an indicator in a census sub-division will be given by a colour associated to a legend. The objective of the creators of this atlas is to disseminate knowledge about Canada to a broad audience.

3) Prescott-Allen's Indexes of the Wellbeing of Nations

Robert Prescott-Allen (2001), a principal of PADATA, a consultancy on nature and culture based in Victoria, British Columbia, has written a book entitled *The Wellbeing of Nations*. The book builds on his earlier work on the Barometer of Sustainability and his Wellbeing Assessment method. His framework attempts to integrate indicators of sustainable development with indicators of economic and social well-being.

The Wellbeing Assessment is a method of assessing sustainability that gives people and the ecosystem equal weight. It provides a systematic and transparent way of:

- deciding the main features of human and ecosystem wellbeing to be measured;

- choosing the most representative indicators of those features; and

- combining the indicators into four indexes: a Human Wellbeing Index (HWI), Ecosystem Wellbeing Index (EWI), Wellbeing Index (WI), and Wellbeing/Stress Index (WSI) - the ratio of human well-being to ecosystem stress. Together, these four indexes provide a measurement of sustainable development.

These four indexes are used in *The Wellbeing of Nations* to measure the sustainability of 180 countries:

- The Human Wellbeing Index (HWI) distills 36 indicators of socioeconomic conditions. The HWI is a more realistic measure of socioeconomic conditions than narrow monetary indicators such as the Gross Domestic Product. It also covers more aspects of human wellbeing than the United Nations Development Programme's Human Development Index.

- The Ecosystem Wellbeing Index (EWI) synthesizes 51 indicators of the state of the environment. The EWI is an equally broad measure of the state of the environment, which, according to the developer, treats national environmental conditions more fully and more systematically than other global indices, such as the Environmental Sustainability Index.

- The Wellbeing/Stress Index (WSI) measures how much harm each country does to the environment for the level of development it achieves. The WSI, and the WI below, measure people and the ecosystem together to compare their status, show the impact of one on the other, and highlight improvements in both.

- The Wellbeing Index (WI) combines the HWI and EWI on the Barometer of Sustainability, a graphic scale that shows how far each country is from the goal of high levels of human and ecosystem wellbeing.

Wellbeing Assessment differs from other methods of assessing sustainability in two ways: it has a dual focus on human and ecosystem well-being, and it uses a Barometer of Sustainability – a graphic performance scale – to sum up a comprehensive set of indicators into the HWI, EWI, WI, and WSI. The Wellbeing Assessment method was developed and tested with the support of IUCN – The World Conservation Union and the International Development Research Centre.

IX Labour Market Macro-indicators

The literature on labour market sets of indicators and composite indexes has focused much more on labour market conditions and outcomes than on labour market inputs such as skills and learning. It is for this reason that no macro-indicators on skills and learning other than the OECD Education Indicators have been included in this report. It should also be noted that many of the economic, social and economic/social sets of indicators and composite indexes earlier discussed in this report include labour market variables.

A. Sets of Labour Market Indicators

1) OECD Education Indicators

In 2001, the OECD released the publication *Education at a Glance* which provided a comprehensive set of indicators on education and skills. The document is implicitly structured into a three-part grouping: context; inputs (including expenditures); and outputs. The seven chapters are on context of education; financial and human resources invested in education; access to education; participation and progression; the learning environment and organization of schools; individual, social and labour market outcomes of education; and learning outcomes of education.

2) ILO Key Indicators of the Labour Market

The International Labour Organization (ILO) has produced the Key Indicators of the Labour Market (KILM) since 1996 in an effort to provide labour market information to member states. The aim has been to develop a complete set of labour market indicators and to widen the availability of labour market indicators. The KILM database provides recent historical (starting in 1980) as well as the most up to date data. The ILO relies on external suppliers like the OECD or the UN to build its KILM data set.[16]

The KILM data set contains data for 18 labour market indicators: (1)labour force participation rate, (2) employment to population ratio, (3) status in employment, (4) employment by sector, (5) part-time workers, hours of work, (6) urban informal sector employment, (7) unemployment, (8) youth unemployment, (9) long-term unemployment,

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[16] The KILM is available in a printed version or electronic version (CD-ROM and online at http://www.ilo.org/public/english/employment/strat/kilm/). Some sample tables are available without charge on the KILM website.

(10) unemployment by educational attainment, (11) time-related underemployment, (12) inactivity rate, (13) educational attainment and illiteracy, (14) wages and labour costs, (15) real manufacturing wage indices, (16) hourly compensation costs, (17) labour productivity and unit labour costs, and (18) poverty and income distribution.

3) CPRN Quality Employment Indicators

The Canadian Policy Research Networks (CPRN) maintains a website (www.jobquality.ca), which contains indicators of work conditions and environment. The website offers 35 indicators for Canada regrouped under 11 themes: communication and influence, personally rewarding work, security, job design, environment, training and skill development, pay and benefits, job demands, employee-supervisor relationship, work schedules, and special indicators (PCs at work and union indicators). The data are provided in the form of charts. Additional indicators are also available depending on the theme.

B. Composite Labour Market Indicators

1) CSLS Index of Labour Market Well-being

The Centre for the Study of Living Standards (CSLS) has in recent years developed an Index of Economic Well-being (IEWB) based on trends in consumption flows, stocks of wealth, inequality, and economic security, as summarized earlier in this report. More recently, the CSLS has developed an Index of Labour Market Well-being (ILMW) based on the framework used to develop the IEWB (Osberg and Sharpe, 2003d). This section summarizes the framework for the ILMW (a table follows on the next page).

Following the consumption/wealth/inequality/security framework of the IEWB, the Index of Labour Market Well-being is built up from:
1. the average current return from work;
2. the aggregate accumulation of human capital which enables future average returns from work;
3. inequality in current returns from work; and
4. insecurity in the anticipation of future returns from work.

The weights given the four proposed components of the index, and the different sub-components, will influence both trends over time and level comparisons across countries. Based on the experience with the Index of Economic Well-being, equal weights are assigned to the four components. It is recognized that equal weights reflect an implicit value judgment about the importance of the components.

The contribution to labour market well-being arising from average current labour market income is captured by two variables: (1) total economy labour compensation per person employed and (2) total economy labour compensation per hour worked. Both variables are expressed in real terms and represent slightly different perspectives on labour market well-being.

Index of Labour Market Well-being Components

A. Labour Market Income (LMI)
1) Labour Compensation Per Worker (LCPW)
2) Labour Compensation Per Hour (LCPH)

B. Human Capital (HC)
1) Average Educational Attainment (EA)

C. Labour Market Equality (LME)
1) Hourly Wage Inequality (HWI)
2) Incidence of Low Wage Employment (LWE)

D. Labour Market Security (LMS)
1) Risk from Unemployment (RU)
   - Average of the Overall (UR) and Long-term Unemployment Rate (LUR)
   - UI Coverage Rate (UICR)
   - UI Benefits Rate (UIBR)
   - Index of Employment Protection (EP)
2) Risk to Health from Employment (RH)
   - Labour Market Death Rate (DR)
   - Labour Market Workplace Injuries Rate (IR)
3) Risk of Poverty in Retirement (RPR)
   - Poverty Intensity for Households Headed by a Person 65 and over (PIE)
   - Social Security Replacement Rate (SSRR)
   - Occupational or Employer-Sponsored Pension Coverage Rate (OPCR)
   - Defined-benefit Pension Plan Membership as Proportion of Occupational Plan Memebership (DRP)

Educational attainment is a key determinant of labour market income, labour force participation, and unemployment. Higher levels of human capital over time raise labour market well-being by raising future expected earnings from the labour market - hence countries with greater levels of educational attainment enjoy higher levels of labour market well-being than countries with lower educational attainment, ceteris paribus. The average level of completed educational attainment in years for the population aged 25 and over is the sole variable for this component of the index.

Individuals clearly care about relative pre-tax individual wages. Survey evidence indicates that most people accept the existence of some inequality in wages, but think that the current degree of wage inequality is excessive. As well, low wages will expose a family to the stresses of working poverty. The index includes two measures of labour market inequality or equality: a wage distribution measure, namely the Gini coefficient or the ratio of the top to bottom decile or quintile for pre-tax hourly wages of all workers; and a measure of the importance of low-income employment in total employment, namely the proportion of workers below one half or two thirds median earnings.

Individuals who have diminishing marginal utility will (ceteris paribus) be averse to risk. For any given level of current income and any given expected value of future income, an increase in uncertainty about future returns from work will diminish current labour market well-being. Risks to future returns from work can come in the form of future unemployment (i.e. the unavailability of future work), or in uncertain future wages or in risks attached to such non wage aspects of employment as workplace hazards to health (which may imply either lower future earnings potential or future incapacity to work). As well, part of the return to current employment comes in the form of a deferred payment – i.e. pension entitlements. Uncertainty about the size of the pensions which will actually be paid in retirement years is a potential source of insecurity.

The possibility of unemployment, and its financial implications, is a major risk for the workforce. We model the overall risk of unemployment by using the arithmetic average of the overall unemployment rate and the long-term unemployment rate; the coverage of the currently unemployed by the unemployment insurance (UI) system; the UI benefits replacement rate; and a measure of the overall degree of employment protection provided by legislation. The four sub-indexes are weighted equally and multiplicatively, (not additive) because of their mutual interaction.

The possibility of risks to health from labour market activity affects to some degree all workers. The lesser the incidence is of workplace-induced health problems, the greater the degree of labour market well-being. Two workplace-health variables are used for the labour market security component of the Index of Labour Market Well-being, namely the death rate from workplace accidents and the time-loss rate due to workplace injury (and workplace illness). The two variables are weighted equally and additive.

Workers typically do not sell their labour power for their entire lives – during their working years they acquire pension entitlements (through the private sector and the state) to finance their retirement years. The degree to which workers' retirement incomes are protected in old age is an important element of labour market security. In addition, the insecurity that people may feel about their prospects in old age depend particularly on the probability of poverty. The third and final variable of the labour market security component of the Index of Labour Market Well-being captures the future income replacement possibilities of workers who are no longer of working age, i.e. those 65 or over.

This sub-index has four component variables. The first is poverty intensity for households headed by an elderly person (65 and over). The second and third components essentially ask (a) what the chances are that a worker gets a pension and (b) how much uncertainty is there in the size of that pension. The overall prevalence of occupational or employer paid pension coverage among the workforce indicates the incidence of contractual savings for retirement (if not the level of such savings). Other things equal, a greater coverage rate increases security. The ratio of membership in defined benefit pension plans to the total membership of all pension plans (defined benefit and defined contribution plans) is an indicator of the certainty of pension amounts, since defined benefit pension plans, in contrast to defined contribution plans, provide more labour

market security by guaranteeing a defined benefit level. Since workers can receive deferred wages either through the public or the private sector, the fourth and final variable is the level of social security benefits as a proportion of the average industrial wage. The four variables are weighted equally and are additive.

The overall labour market security component of the Index of Labour Market Well-being is the weighted average of the three subcomponents, namely the risks imposed by unemployment, the risks to health from employment, and the risks of poverty in retirement. The weighting of the components is assumed equal.

X Conclusion

No existing framework currently includes all important concepts and linkages and it is unlikely that one ever will. As the survey of the macro-indicators literature reveals, the development of a framework for macro-indicators involves choices related to the domains of interest, the purpose for which the indicator is designed, and the population to be covered, among others. Choices or tradeoffs must be made and a balance struck between conceptual sophistication and transparency and between complex linkages that potentially confuse the user and simplicity.

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Exhibit 1

Summary Table of Frameworks for Development of Macro-indicators

Categories/Domains	Indicators
1. European Community Social Indicators	
Level 1 consists of a small number (around 10) of lead indicators for the main fields to be covered (commonly agreed upon and defined by all member states).	• risk of financial poverty as measured by 50 and 60 per cent of national median income using the OECD modified equivalence scale; • income inequality as measured by the quintile share ratio; • proportion of those aged 18-24 who have only lower secondary education and are not in education or training leading to a qualification at least equivalent; • overall and long-term unemployment rates measured on an ILO basis; • proportion of the population living in jobless households; • proportion failing to reach 65, or the ratio of those in bottom and top income quintiles who classify their health as bad or very bad on the WHO definition; and • proportion of people living in households that lack specified housing amenities or have specified housing faults.
Level 2 indicators, which would not be limited in number, support the lead indicators and describe other dimensions of the challenge (commonly agreed upon and defined by all member states).	• proportion of persons in households below 40 per cent ad 70 per cent median income, and proportion below 60 per cent of median fixed in real terms on a specific date; • value of 60 per cent of median threshold in purchasing power terms for one and four person households; • proportion of the population living in households that are persistently at risk of financial poverty; • mean and median equivalized poverty gap for the 60 per cent median; • income inequality as measured by the decile ratio and Gini coefficient; • proportion of the population aged 1-59 (64) with only lower secondary education or less; • proportion of discouraged workers, proportion non-employed, and proportion of involuntary part-time work (as a percentage of the total population aged 18-64 excluding those in full-time education); • proportion of people living in jobless households with income below 60 per cent of the median; • proportion of employees living in households at risk of poverty (60 percent median); • proportion of employees who are low paid; • proportion of people unable to obtain medical treatment for financial reasons or on account of waiting lists; • proportion of people living in household that have in arrears on rent or mortgage payments; and • proportion of people living in households unable in an emergency to raise a specified sum.

The Level 3 indicators are decided by individual member states to highlight national specificities.	• variable

2. Human Development Index

Longevity, as measured by life expectancy at birth.	
Educational attainment	• adult literacy (two-thirds weight) • combined first-, second- and third-level gross enrolment ratio (one-third weight)
Standard of living, as measured by, real GDP per capita (PPP$)	

3. OECD Social Indicators, 2001

Social context	• national income • fertility rates • old-age dependency ratio • foreigners and foreign-born population • refugees and asylum-seekers • divorce rates • lone-parent families
Social status	Self-sufficiency • employment • unemployment • jobless youth • jobless households • working mothers • retirement ages Greater equity of outcome • relative poverty • income inequality • low paid employment • the gender wage gap Improved health status • life expectancy • infant mortality\ • potential years of life lost • disability-free life expectancy • accidents

	Social cohesion • strikes • drug use and related deaths • suicide • crime • group membership • voting
Societal response	Self-sufficiency • activation policies • spending on education • early childhood education and care • educational attainment • literacy, replacement rates • tax wedges Greater equity of outcome • minimum wages • public social expenditures • private social expenditures • net social expenditure • benefit recipiency Improved health status • older people in institutions • health care expenditures • responsibility for financing health care • health infrastructure Social cohesion • prisoners

4. Centre for the Study of Living Standards Index of Economic Well-being

Consumption Flows	• real total consumption (dollars per capita) • real current government spending on goods and services excluding debt service (dollars per capita) • real value of unpaid labour (dollars per capita)
Stocks of Wealth	• real capital stock (including housing) (dollars per capita) • real R&D stock (dollars per capita) • real stock of natural resources (dollars per capita) • real human capital stock (dollars per capita) • real net foreign debt (dollars per capita) • real social cost of environmental degradation (CO_2 emissions) (dollars per capita)
Equality	• LIM poverty intensity • After-tax income Gini coefficient

Security	• risk imposed by unemployment • risk imposed by illness • risk imposed by single parent poverty • risk imposed by poverty in old age
5. Treasury Board Quality of Life Indicators	
Economic opportunities and Innovation	• real GDP per capita • real disposable income per capita • innovation • employment • literacy • educational attainment
Health	• life expectancy • self-reported health status • infant mortality • physical activity
Environment	• air quality • water quality • biodiversity • toxic substances in the environment
Strength and safety of communities	• volunteerism • attitudes towards diversity • participation in cultural activities • political participation • safety and security
6. Economic Gender Equality Indicators	
Income	• the ratio of female to male income measured on an earnings • money income • after-tax income basis
Work	• the female/male ratios for paid, unpaid and total workloads
Learning	• the female/male ratios for university degrees granted • on the job training participation and time • occupational returns to education for university graduates