

A Review of Social Indicators for Land Use Planning in British Columbia

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Executive Summary

This paper reviews recent land use plan Socio-Economic and Environmental Assessments (SEEs) to assess the indicators used for measuring social change and discuss their use in light of the emerging research on social indicators.

While social indicator research has a long history in many fields, it is relatively new to natural resource and land use planning in North America. There is a growing body of literature on social indicators that gives planners confidence in going beyond employment and population statistics as sole social indicators. By and large, the SEEs and related documents conducted in support of land use planning lack theoretical frameworks for the selection of indicators; however, there are opportunities to improve the linkages between the selection of social indicators and social science research.

Social indicators are used primarily to measure social changes over time in a plan area, regardless of the effects of land use planning. They are also used during plan implementation to monitor changes in social conditions that can be attributed to land use planning. The ability to attribute social changes to land use planning is problematic as many factors influence social conditions. This limits planners to using indicators that are directly affected by land use planning, such as outdoor recreation infrastructure, economic indicators, and First Nations access to cultural resources. Where the purpose of indicators is to understand social change in a plan area, the range of indicators and indicator frameworks can be broadened to include those focused on social process (such as social capital) as well as profile indicators, such as unemployment and population rates. While social process indicators require primary data collection, tools such as Participatory Rural Appraisal and Rapid Rural Appraisal can be adapted to keep data collection costs to a minimum.

A literature review of several frameworks assisted in developing a logic model for social indicators in support of land use planning. For this discussion, a community capacity indicator framework synthesized by MacKendrick and Parkins (2004a) is likely the best fit for assessment and implementation of land use planning in British Columbia.

Methods to select social indicators can be “top down” (expert-driven) or “bottom up” (locally driven). The literature recommends a combination of the two approaches be used to take advantage of the best available science while addressing specific context and priorities of communities within a plan area. The literature discusses several case studies of the “top-down-meets-bottom up” approach to indicator selection. The ability of communities and individuals to cope with change, to adapt, to take advantage of new opportunities, and to thrive under new circumstances has become a principle interest. Thus contemporary research is focused on concepts of community capacity, resilience, and vulnerability as indicators of the adaptive capacities of human communities.

Indicator frameworks found in the literature do not prescribe a set of indicators but offer a menu of indicators framed around research-based categories of

indicators. Statistics Canada and BC stats continue to offer the best sources of profile indicator data because of their ability to compare statistics over time and across regions. There are numerous sources of composite social indicators (indices) in the literature but the methodology and assumptions for these indicators should be carefully examined before applying them.

1. Introduction

1.1. Purpose and audience

The British Columbia Ministry of Agriculture and Lands (MAL), through the Integrated Land Management Bureau, has the responsibility for developing, implementing, and revising land use plans on Crown lands in the Province of British Columbia. Among the documents prepared in the land use planning process in B.C. have been Socio-Economic and Environmental Assessments (SEEA) and the base case studies that accompany most high-level land use plans (Commission of Resources and Environment—CORE and Land and Resource Management Plans—LRMPs) and some local plans (Sustainable Resource Management Plans—SRMPs). SEEA, conducted by local consulting firms in conjunction with MAL, have provided contextual information on plan areas and communities affected by the land use decisions and made predictions on the impacts on social, economic, and environmental factors, relative to the status quo (“base case”) land use alternative.

This report reviews the suite of indicators used in recent SEEA and related documents (base cases and draft SEEA) to assess the appropriateness of the indicators for measuring social change as a result of land use planning and to discuss their use in light of the growing body of research on social indicators. The tasks included:

- reviewing the SEEA and related documents to look for trends and gaps in social indicators used in land use planning;
- conducting a literature search on social indicators, social indices, and indicator frameworks used in similar application in different jurisdictions;
- conducting interviews with content experts to identify additional indicators, indices, and frameworks for which there are theoretical bases and links with land use planning; and
- developing a logic model showing the linkages between indicators relating to social impacts of land use planning and land use change.

It was expected that this report would be useful to authors of future SEEA, land use planning implementation committees and decision makers as they attempt to understand the social implications on communities and individuals affected by land use planning.

Several previous analyses have informed this project. In 2001, Pierce Lefebvre Consulting developed a summary of socio-economic impact assessments and three academics reviewed the Guidelines established for the SEEA in 2002. The most recently updated draft version of the SEEA Guidelines is available on MAL’s Economic Analysis section’s website.¹ This review focuses specifically on the indicators used to assess the social impacts of the land use plans.

¹ http://www.al.gov.bc.ca/clad/strategic_land/econ_analysis/projects_pubs/cabinet/SEEA_guidelines.pdf

The decision of MAL to commission this review is very timely. Within the past five years, there has been a growing body of literature on social indicators that give planners confidence in going beyond the choice of employment and population statistics as the sole social indicators. While social indicator research has a long history in many fields, particularly in international development, it is relatively new to natural resource and land use planning in North America.

1.2. The use of social indicators in land use planning

Raymond Bauer (1966), sometimes referred to as the founder of the social indicators movement, defined social indicators as “statistics, statistical series, and all other forms of evidence that enable us to assess where we stand and are going with respect to our values and goals, and to evaluate specific programs and determine their impact.” In this definition, “we” is assumed to be an agency or organization that aims to create certain outcomes and that the agency or organization has specific social goals that drive the creation of the indicators. The values (explicit or implicit) of an organization will determine how social indicators are defined. The European Environmental Agency, for example, defines social indicators as a set that measure progress towards the policy objectives designed for promoting employment, combating poverty, improving living and working conditions, combating exclusion, and developing human resources (EEA 2007).

Land use planning can be considered an intervention in a defined geographic area designed to affect ecological, economic, and social outcomes. Decision makers and stakeholders develop indicators so they can track the extent to which changes in social conditions can be attributed to land use planning—impacts that might occur both from the process of doing, and from the decisions that arise out of, land use planning. Indicators are used as an evaluation tool to ask whether or not (and how) land use planning made any difference when compared with the status quo.

Once social indicators are measured, judgments can be made about desirability of the effects—i.e. are there adjustments that need to be made based on how the land use planning affected individuals, interest groups, and communities? The question that faces the academic and planning community, as well as local communities in British Columbia, is: What individual, or collection of, social indicators should be used to best measure the social impacts of land use planning?

Until very recently, assessing human impacts of land use decisions in British Columbia relied on indicators relating to community economic stability (usually timber supply-related). However, the assumptions that link community and individual well-being solely to timber supply are no longer relevant, indeed if they ever were. The complexity of factors affecting human communities and an increased knowledge of their dynamic ecology have led to a call for a more holistic approach to indicator selection.

Several natural resource organizations and agencies such as the Canadian Model Forest Program have developed social indicators, but there are few examples of such organizations with the responsibility of land use planning. Even the Oregon Department of Land Conservation and Development (DLCD), well known for its nearly 30 years of comprehensive land use planning, only reports on the effects of

land use planning goals on the availability of social housing as the key social indicator (Steckler 2007 pers. comm.).

The current literature discusses indicators in terms of various “indicator frameworks” that serve as the conceptual structures on which indicators are based. The literature shows that there are many different ways social indicators are framed, depending on a particular author’s disciplinary background. The large number of different frameworks (and disciplines they represent) found in the literature can be overwhelming to practitioners who are trying to operationalize the use of indicators in land use planning or other initiatives. Typically, authors base their framework on their academic world view, leaving the practitioner to decide which framework best fits their own world views.

Sociologists and rural development researchers have built indicator frameworks based on sociological concepts such as community capacity and social capital. Other authors have built indicator frameworks based on systems theories that include resilience and adaptation to change. Given the wide array of disciplines and perspectives, it would be no surprise that practitioners use concepts and phrases such as “civic vitality” without a clear sense of the theoretical framework or discipline that grounds each term.

A common approach to developing social indicators is to draw on published research. This top-down, or expert-based, approach to indicator development has the advantage of theoretical grounding. It lends itself to the use of secondary data and offers some basis for comparison with other locales. In contrast, the bottom-up approach, where community members are involving in identifying social indicators, provides an opportunity for social indicators to more directly link to the regional context and community goals. Both the “top-down” and “bottom-up” approaches have an important place in social indicator selection.

1.3. Methodology

This review involved four distinct tasks:

Task 1: A review and analysis of current data sources and indices used in the existing Socio-Economic and Environmental Assessments (SEEs) and related documents, as well as indicators selected by the coastal land use plan implementation committee. A spreadsheet outlining social indicators discussed in the existing SEEs was developed with common themes and gaps in the social indicator suites used in these documents (see Appendix A).

Other documents that informed this review included the provincial summary of SEEs (Pierce Lefebvre’s *Socio-Economic Impact Assessment on the Provincial Government’s Strategic Land Use Plans on Key Sectors in British Columbia*), as well as three academic reviews of the SEE Guidelines conducted by Helliwell (2002), Scarfe (2002), and Rondeau (2002).

The SEEs and related documents reviewed are shown in Table 1.

Table 1: SEEAs and Related Documents

Documents
Vancouver Island Summary Land Use Plan Socio-Economic And Environmental Considerations (Web site: year unknown)
Haida Gwaii SEEA of Haida Gwaii/QCI Land Use Viewpoints 2006
SEEA for the Peace Moberly Tract: Base Case 2006
Sea to Sky Land and Resource Management Plan (LRMP) Socio-Economic Base-Case Update 2005
Morice Land and Resource Management Plan SEEA: Morice LRMP Table Final Land Use Recommendations 2004
North Coast Socio-Economic and Environmental Assessment of LRMP Scenario developed by the North Coast LRMP Volume I: Socio-Economic Analysis 2004
West Babine Sustainable Resource Management Plan SEEA 2004
Eight Peaks Winter Recreation Sustainable Resource Management Plan SEEA 2003
SEEA of the Draft Rocky Mountain Management Plan 2003
Kalum Land and Resource Management Plan SEEA Final Report 2002
Central Coast Land and Coastal Resource (LCRMP) Phase 1 "Framework Agreement" SEEA 2001
Lillooet Land and Resource Management Plan SEEA of Phase 1: Framework Proposals: Final Report 2001
Cassiar-Iskut-Stikine LRMP Recommendation Package- SEEA Final Report 2000
MacKenzie Land and Resource Management Plan Socio-Economics Assessment of "MacKenzie Draft Recommended Land and Resource Management Plan 2000
Dawson Creek Socio-Economic/Environmental Impact Assessment of Recommended Land Use Plan 1999
Robson Valley Land and Resource Management Plan Section 3.0, SEEA (1999 Web site)
Bulkley Land and Resource Management Plan SEEA 1998 (Web site)
Fort St. James Recommended Fort St. James Land and Resource Management Plan SEEA 1998
Prince George Land and Resource Management Plan Reference Document 8.5 SEEA 1998
Fort Nelson LRMP Socioeconomic & Environmental Assessment of Recommended Land & Resource Management Plan: Community and First Nations implications (1997 Web site)
Fort St. John Land and Resource Management Plan SEEA, Introduction and Overview Summary (1997 Web site)
Lakes District Land and Resource Management Plan Preliminary Socio-Economic and Environmental Analysis of Draft Land Use Plan (Scenario O) 1997
Vanderhoof Land and Resource Management Plan SEEA of Base Case and Consensus Land Use Plan 1996

Task 2: Conduct a literature review and analysis of the current state of the science and of the use of social indicators and indices. Seven content experts were also consulted: four social scientists and three community development practitioners with experience developing SEEAs and community strategies related to the land use plans.

Experts provided research literature, background documentation, and professional input, as well as reviews of report drafts.

Task 3: Develop a logic model using indicator frameworks and indicators linking land use planning, land use change, and social outcomes based on the literature.

Task 4: Make recommendations related to establishment of social indicators and the use of indices relevant to land use planning and development of future SEEAs.

1.4. Assumptions

The review and analysis was based on the following assumptions:

- The primary purpose of developing social indicators associated with land use planning is to assess the potential social impacts of the proposed land use plan or to assess the effectiveness of land use planning on the achievement of social goals in the land use plans. A secondary purpose is to provide a framework to assess social changes in the plan area, regardless of whether observed social change can be linked with land use planning.
- Social indicators refer to factors relating to groups of people and individuals, not to natural resources. For example, in at least one SEEA, water quality is listed as a social indicator. Human health indicators may derive from water quality, but water quality itself would not be considered a social indicator.
- In considering the social impacts of land use planning, the following relationships are assumed:
 - a link exists between land use planning and land use change (that land use change is affected by land use planning);
 - a link exists between land use changes and social change; and
 - there may also be direct linkages between land use planning and social change.
- This review considered effects of both the land use planning process (such as increased community participation in natural resource decisions) and the land use changes that derive from land use planning.
- Social indicators are those indicators that affect people and groups living and/or working inside the plan area, as well as those directly affected by land use decisions and living and/or working outside the plan area. It would be impossible to draw reliable linkages between land use change inside a plan area and social factors related to people living far from the plan area.

- Methods to select social indicators for any given land use plan or activity can be “top down” (expert-driven) or “bottom up” (locally driven), or a combination of the two approaches. This report recognizes the importance of locally driven indicators, but the literature review focused on the academic approach of selecting indicators based on published literature.
- Indicators discussed in these documents will be used to track changes in social factors in a specific geographic area over time (usually before planning and after planning) rather than comparing across regions or provincially at one point in time.

1.5. Challenges of social indicators in land use planning

The review revealed several challenges in using social indicators for land use planning:

- Social indicator terminology used in the literature and the SEEAs is sometimes confusing and definitions often overlap. The literature offers various ways to describe community impacts (such as community sustainability and community capacity) and many indicators are considered subsets of the others. Not all authors agree what indicators should be considered subsets of the others. Although many authors consider these terms as indicators, many are constructs that themselves require indicators.
- There is tension between the desire to measure specific social outcomes and the need to choose indicators for which there is a good likelihood of being able to attribute the change to land use planning. Many factors influence social indicators and it’s usually difficult to distinguish the effects of land use planning from the effects of other factors.
- The criteria used for selecting indicators may limit the ability for planners to choose indicators that measure desired outcomes. For example, if indicator data must be readily available through existing sources, such as Statistics Canada, this would eliminate many of the indicators that the literature is now saying are valuable for completely understanding a full range of social and community factors.
- Indices such as the BC Stats Socio-Economic index are intended to provide cross-sectional analyses at a point in time, not for “before and after” analysis. Thus, comparing index values for a particular region from one time period to the next could be misleading.

According to B.C. Stats, a change in an index value for a particular region over time does not necessarily mean an improvement in conditions within the region; it could mean that other areas are worse off. To determine the appropriateness of any index in the literature for land use planning, the methodology used to derive the index, as well as the assumptions and limitations of the index, should be fully

examined. There was not sufficient time in this project to examine the many potential social indicator indices available to this depth.

- There is a range of social, economic and environmental goals in land use plans. Indicators are derived from the goals and objectives of a land use plan, which in turn, are outgrowths of the underlying values embedded in the plan.
- SEEs and guidelines assess the net economic efficiency of a land use plan as an assumed explicit goal of an LRMP. As Rondeau (2002) points out, there can be other implicit economic goals such as equity and redistribution of benefits and costs.

2. Review of Guiding Principles, Guidelines, and SEEs

Twenty-two SEEs and related documents were examined to identify trends and gaps in social indicators. This section provides observations about the guiding principles, the guidelines, and the SEEs and related documents regarding their handling of social indicators and indices.

2.1. Observations about guiding principles and guidelines

The “Guidelines for Socio-Economic and Environmental Assessment for Land Use Planning and Resource Management Planning” was built on a series of earlier guidelines and reviews, and released by the Ministry of Agriculture and Lands (2006). It currently is the document that provides guidance on how to conduct SEEs in BC. The guidelines recommend use of a “multiple accounts assessment” format that allowed for inclusion of both qualitative and quantitative indicators. SEEs are to be organized by six categories, including one called “Social Implications” (including communities and well-being) and “Specific Aboriginal Implications.” Indicators of social implications should include the following:

- Impacts on population
- Jobs and income
- Distribution of job opportunities (presumably demographic distribution)
- Resource recreation based recreation activities and non-commercial uses of crown lands
- Other aspects of well-being (not defined)

The guidelines say also that “as much as possible, the analysis should also reflect how the affected communities view the likely effects. This would require initial discussions with community members” (SEEA Guidelines, March 2007, p. 22). In assessing how well a plan serves the interests of plan-area stakeholders, the SEEs should document the extent to which each scenario meets the desires of plan area residents. This implies development of indicators that reflect these values and preferences, and primary research on values and preferences at the local level. This kind of data collection has not been conducted systematically for the SEEs, largely because of time and budgetary limitations.

The guidelines also suggest that both quantitative and qualitative measures should be used.

“For impacts such as population, jobs, income levels and tax effects, quantitative impact measures can be estimated. For most other concerns (impacts on community goals), qualitative measures based on relevant indicators identified in the pre-evaluation assessment will be required” (SEEA Guidelines, March 2007, p. 22).

However, a researcher’s choice to use qualitative or quantitative methods depends as much on the research question being asked and the budget and time available for data collection. Also, many indicators that may appear to be qualitative can be measured quantitatively, as indicated by Richard Stedman’s work (1999) on sense of place and other recent work on social capital for which quantitative measures have been developed. Quantitative data are best for allowing the comparison of results over time while qualitative research is designed to gain insight into the depth of an issue or interest. In other words, quantitative provides breadth and comparability, where qualitative provides depth of understanding or exploration of a topic.

2.2. Observations about SEEA

The review of past SEEA revealed that, by and large, while the SEEA and related documents include many reference to social indicators, they lack references to a theory or conceptual framework for their selection of these indicators. While population growth and mobility are relevant indicators, they provide only a limited picture of the social implications of land use planning, much in the same way that a country’s Gross Domestic Product as a national-level social indicator reports on the total value of economic activity at one point in time but fails to describe the underlying factors (Reed, 2000). Not all SEEA were clear whether the population indicator refers to shifts in numbers of people living in the plan area, or demographic shifts (such as older population moving in, young people moving out).

Most of the SEEA documents are dominated by economic indicators; social indicators are considerably less developed by comparison. Most SEEA and related documents referred to population, First Nations access to cultural and sustenance sites, as well as other indicators such as recreation and wilderness/scenic values. B.C. Stats and Statistics Canada were cited as the source for most indicator data.

There are several possible reasons why the SEEA and related documents favoured economic indicators:

- The guidelines’ recommendation to organize impacts by economic sector may steer authors towards focusing on economic factors as the key considerations in the SEEA.
- There could be an assumption by SEEA authors that all or most social indicators flow from economic indicators; that social indicators will “take care of themselves” if the economic factors are measured and accounted for.
- Some may assume that as a biophysical exercise, land use planning cannot directly affect social factors and affecting economic factors may be the only way to bring about desired social outcomes.
- “Social process” (such as development of social capital) in natural resources is relatively new in B.C. that it is only now being applied to land use planning.

- Authors may not be familiar with social indicators or there may not be a connection between social indicator theory and SEEA authors. There may not have been exposure to the latest literature on sense of place, social capital, and other concepts from which valuable social indicators could be drawn.

Economic indicators may dominate the lists due to a combination of these factors. Increasing planner and stakeholder knowledge of the current frameworks and research on social indicators in natural resources will be an important step in increasing the use of science in development of indicators.

There were many references to social constructs such as community well-being and community health in the SEEAs and related documents but they are discussed largely without defining the terms or developing indicators for them. Table 2 shows a list some of the terms used in the SEEAs.

Table 2: Social construct terms used in SEEAs and related documents

Term used	Example(s) of SEEA(s) or related document that use(s) the term
Civic vitality	Morice
Quality of life	Haida Gwaii
Well-being	Eight Peaks
Community health	Bulkley
Sense of community	Lakes District and Vanderhoof
Community resilience	Sea to Sky and Morice
Community capacity building	Morice
Local empowerment	Morice

Other observations include the following:

- Many social indicators that appear in the sections on social and community impacts are discussed implicitly rather than being listed explicitly. Exceptions to this include the Okanagan Shuswap SEEA where indicators are listed in a table (but not fully defined), and the Morice SEEA, which lists the indicators adapted from the Morice Innovative Forest Practice Agreement process.
- There is lack of standardization in social indicator selection across SEEAs. This is not surprising given they are a product of a locally driven public consensus-based process that expresses local community goals. As no SEEA or related document discusses theoretical linkages between land use planning and the selected social indicators, there is no explanation of why a certain indicator was selected or reference to a conceptual framework on which the indicator was selected. In the words of one expert consulted in this review, the “indicators in the SEEA documents are begging for structure.”

- Most SEEAs and related documents that discussed social indicators listed them as individual indicators, while one SEEA referred to a composite social indicator, in which individual indicators were combined to give a single score (B.C. Stats Regional Socio-Economics Index). The Socio-Economics Index is a weighted formula using economic hardship, crime, health, education, and children and youth indices as variables to provide an aggregated score. No other document reviewed, used or referred to a composite social indicator.
- Some planning tables implied social indicators in the LRMPs that were not reflected in the SEEAs. For example, in the Robson LRMP one goal was to “increase community influence over resource management” but the SEEA did not report on an indicator to reflect this goal.
- The SEEA Guidelines assume that outdoor recreation opportunities are a factor in quality of life. This link has no theoretical basis, and assumes that people feel more satisfied if they have the opportunity to recreate in the outdoors. This assertion would need to be verified through local data collection (such as community survey) to determine whether community members indeed linked outdoor recreation to quality of life.
- As pointed out by Rondeau (2002) in his academic review, social indicators in the SEEA do not capture stakeholder and resident preferences. This would seem to ignore an important element in assessing the impacts of land use planning. To include an indicator on preferences would imply a requirement for primary data collection in the plan area.

The list of the SEEAs reviewed and their associated social indicators is in Appendix A.

3. Literature Review

This literature review includes a search for general social indicators research, social indicator research specific to forest-dependent communities, theories of community sustainability, resiliency, and capacity, as well as land use planning literature. There is a myriad of definitions, theories, and models for concepts related to human communities, representing a variety of disciplines. Some of the early work in developing land use-related social indicators in North America arose from the National Environmental Policy Act of 1969 that required Social Impact Assessments (SIA). Guidelines for SIAs published by several federal agencies in the 1990s recommended that SIAs include social indicators.

Some of the most influential current and relevant work on social indicators in Canada comes from the literature on sustainability of forest-dependent communities, led by social scientists with the Canadian Forest Service, universities, and the Canadian Model Forest Network.

3.1. Approaches and theories for selection of social indicators

3.1.1. Early social indicators research

The use of social indicators has a long history in many fields beginning in the middle of the last century. The use of social theory to guide the development of indicators has gradually matured since the 1970s. The *Journal of Social Indicators Research* has chronicled social indicator research since its inception in 1974 and includes an increasing number of articles that report on theories of indicators for various constructs. However, much of the work on social indicators relates to government social intervention programs (such as welfare reduction programs) rather than land use.

The earliest work on social impacts of land use was focused on community stability in forestry-dependent communities. Kaufman and Kaufman (1946) made the link between the sustainability of the timber resource and the sustainability of rural communities. Within this context, a central issue was managing industrial activity and ensuring sustained yields in ways that could mitigate the peaks and valley of commodity-based industries. The general thinking was that community stability was largely a function of employment. Although a much broader range of social indicators is used in contemporary policy and management, the focus on employment statistics continues to pervade social indicators frameworks (e.g., CCFM 1995), and is evident in the approach taken in the SEEAs.

Although much of the early analysis of community stability took place in the U.S., concerns associated with resource depletion and cyclical markets were also prevalent in Canada during the 1950s and 1960s. It took until the 1970s, however, for researchers to begin exploring other aspects of social and economic change in resource-based communities. Researchers such as Lucas (1971), Bowles (1982),

Marchack (1983), and later, Lee and Eckert (2002) represent some of the foundational work on the social conditions and impacts of single industry towns. They observed issues such as alcoholism, gender discrimination, and human capital deficits that were associated with instability in resource-based towns. The work of these authors was instrumental in broadening an understanding of social and economic impacts in land-based programs.

In recent years, the focus on the stability of forest-dependent communities has been replaced by a more dynamic understanding of community change and progress that has started to be reflected in the LRMPs, SRMPs, and SEEAs that use terms such as community sustainability, social capital, and civic vitality. At the core of this new thinking is the understanding that, like natural ecosystems, human communities are in a constant state of change. The ability of communities and individuals to cope with change, to adapt, to take advantage of new opportunities, and to thrive under new circumstances has become a principle interest. Thus contemporary research is focused on concepts of community capacity, resilience, and vulnerability as indicators of the adaptive capacities of human communities.

3.1.2. Indicator categories

In a recent review of social indicators research, Sheppard *et al.* (in review) provide a useful summary of the dominant categories of social indicators. They divided indicators into four categories: social process, direct social outcome, perceptions of satisfaction, and capacity and knowledge indicators, as shown in Table 3.

Table 3: Indicator framework developed by Sheppard et al. (in review), with examples

Indicator categories	Description	Examples
Social process indicators	Address issues associated with procedure, public participation, governance and communication	-# public meetings held -# of Memoranda of Agreements signed -# of people who identify with community as critical to personal identity
Direct social outcome indicators	Address the state of key social values, resources or conditions associated with human well-being and quality of life	-# of students completing Grade 12 Economic Diversity Index -# of adults receiving employment insurance
Perceptions of satisfaction indicators	Address outcomes as expressed by people's views on and evaluation of social conditions and forest management	Level of satisfaction with current health services Level of satisfaction with current land use plan
Capacity and knowledge indicators	Address indicators that deal with individual and community capacities and functioning	-# new civic organizations formed -Formal group membership levels

This overview provides an important reminder that social indicators are associated with many arenas, such as public participation, policy, and public values and perceptions.

3.1.3. Conceptual frameworks for indicators

A variety of social sciences such as sociology, geography, and human ecology each offer their own way of framing their lists of social indicators that are grounded in their respective disciplines. This section reviews two types of frameworks which link indicators to social science research and that can be adapted for adapting to land use planning: community resiliency and community capacity. Many of the concepts listed in the SEEAs, such as social capital and civic involvement, fit within these frameworks. The broad array of social indicator frameworks currently used in sustainable forest management planning can be adapted for use in land use planning.

Community resiliency theories and indicator frameworks

During the late 1990s, researchers published a framework for social indicators based on the “human ecosystem” or resiliency framework (Machlis *et al.* 1997; Force and Machlis 1997). Based on the theory that humans exist within social systems, not unlike how plants exist in ecosystems, this framework assumes that human systems require three critical resources: natural resources, socio-economic resources, and cultural resources. These are accompanied by three subsystems: social institutions, social cycles, and social order.

The authors asserted that the three subsystems, combined with the three critical resources, provide a workable structure for social indicators that is based in theory and supported by empirical studies. Machlis *et al.* (1997) said that there is a wide variety of possible indicators for each of the six variables and that the choice of indicators can be based on practical considerations such as understandability by practitioners, availability from existing secondary sources, as well as their adherence to the model. Table 4 shows examples of indicators selected for an indicator project in the Interior Columbia Basin (Force and Machlis 1997) using the six variables.

Table 4: Indicator framework developed by Machlis et al. 1997 used in the Interior Columbia Basin.

Variables	Examples of indicators used
Natural resources	Population density, housing units heated with wood
Socio-economic resources	Library loans, unemployment rates, median household income
Cultural resources	Major religious groups
Social institution	Education levels, community organizations
Social cycles	Age of populations, number of full-time workers
Social order	Poverty rates, divorces, crime rates

Community capacity theories and indicator frameworks

Another conceptual framework for developing social indicators comes from the broad arena called community capacity, including initiatives such as the National Round Table on the Environment and Economy (NRTEE) and the New Rural Economy Project (<http://nre.concordia.ca/>). Both of these initiatives frame indicators around four types of capital (natural, economic, human, and social) that aid in

understanding the capacity of a community to meet its needs and form the basis of indicators.

In a synthesis of community sustainability research in B.C., MacKendrick and Parkins (2004a) reviewed the NRTEE framework as well as several other research initiatives in B.C. using the community capacity framework. These initiatives include:

- Robert Prescott Allen (Well-being assessment and human well-being index)
- Ralph Matthews (Resilient communities project)
- Bill Reimer (New Rural Economy project)
- John Parkins (Sustainable communities in the Robson Valley)
- Stephen Sheppard (Landscape visualization)

The analysis of these individual initiatives led to the development of a synthesis framework for developing social indicators, shown in Table 5. The framework includes the four types of capital plus economic and civic vitality, physical and mental health, recreation, and what they call “process indicators” (related to leadership and community visioning). Community assets (resources) are defined as different forms of the capital that are associated with core capabilities associated with a community. Like the human ecology framework discussed previously, there is wide variety of indicators that could be selected for each of these indicator categories. The strength of the framework is that the set of categories is based in sociological theories; the selection of indicators can be based on practical considerations as well as adherence to the categories. Table 5 below shows the categories.

Table 5: Indicator framework developed by MacKendrick and Parkins (2004a). Bolded indicators are social indicators

Variables	Description
Community assets (resources)	
Natural capital	Mammals, fish, forest, minerals, water supply
Economic capital	Physical and financial infrastructure such as roads, houses, income, hospitals, services
Human capital	Education, training, student enrolment
Social capital	Social organizations, clubs, trust levels, racial harmony
Community outcomes (goals)	
Ecological integrity	Visible stewardship, water quality, rates of endangered or threatened species, air quality
Economic vitality	Economic diversity, incidence of low income, employment rate, entrepreneurship
Civic vitality	Social support, sense of place, satisfaction with

	government and community
Physical & mental health	Access to health care, reports of stress, social pathologies
Recreation	Recreation areas, satisfaction with quality of indoor and outdoor facilities
Process indicators	Leadership (quality and quantity), volunteerism rates, direction, ability to harness various resources (internal /external)

Most indicators in these frameworks have been applied to community sustainability in the past, but the concepts of social capital and sense of place are relatively new to the literature as components of human well being. Social capital refers to the social networks that develop in a community, and is increasingly recognized as a key concept in community sustainability. The concept was brought to public light by author Robert Putnam in *Bowling Alone: America's Declining Social Capital*. Matthews (2005) have brought the concept to British Columbia by conducting studies to measure social capital and to study the link between social capital and economic development in rural B.C. While measuring human capital (such as education and school enrolment) is well established and available in the census data, the area of social capital is relatively new. While researchers have not developed a “catch all” suite of social capital indicators, the frameworks or domains have been developed that locally developed indicators can fit into. The scientific community is increasingly able to quantify social capital indicators, such as the number and strength of social linkages in a community, the nature of the mutual obligation inherent in those ties, and the geographic distribution of the ties.

Sense of place is defined as the meanings and attachments held for a spatial setting by an individual or group. This factor can only be measured from the point of view of community members themselves, and not as a profile indicator. Sense of place can be divided into three concepts: satisfaction towards the condition of the place, attachment to the place as a reflection of one's sense of self, and descriptions of meanings a place has for an individual. This measure is quantifiable and can be entered into models predicting individual and collective behaviours that are related to community sustainability (Stedman 1999).

A synthesis framework was applied in the Morice and Lakes Innovative Forest Practices Agreement (IFPA), where local-level indicators were developed for the communities of Burns Lake and Houston, B.C. and several surrounding areas (MacKendrick and Parkins 2004b). Through the use of secondary data (from various government departments and Statistics Canada) as well as primary data (household surveys), detailed baseline data on community assets and outcomes were developed. This led to general conclusions about the level of human, economic, and social capital in the region as well as the general level of performance with respect to various capacity outcomes.

3.1.4. Examples of top-down approaches to social indicator selection

An example of a top-down approach of indicator selection is shown in Table 6. Parkins and Beckley (2001) developed a set of six indicator areas that were used to assess community sustainability in the Foothills Model Forest in Alberta. These

indicators were selected because (1) published literature shows a theoretical grounding for key concepts in the study of sustainable communities, (2) data are readily available, and (3) data from these indicators can be readily integrated into other indicator frameworks and long-term monitoring programs.

Table 6: Indicator framework from Parkins and Beckley 2001

Categories	Description
Population and migration	Change in population, migration, age structure
Employment	Unemployment, labour force participation, gender differences in employment, employment by sector
Income distribution	Average income, distribution of incomes, income gaps
Poverty	Incidence of low income, individual and family poverty, caseload data from Family and Social Services
Human capital	Education attainment, school attendance, highest level of education
Real estate	Average household values, payments on housing, rent payments, number of renters versus owners

This approach was defined as a top-down approach in part because communities inside the boundaries of the Foothills Model Forest were not consulted on the selection of these indicators. These indicators do not necessarily represent goals and aspirations of communities inside the model forest boundaries. On the other hand, these indicators provide a general overview of key socio-economic trends, are based in theories of social and economic development, and are based on data that are readily available through Statistics Canada.

Other examples of top-down approaches to indicators development include:

The Wellbeing of Nations: Developing Tools for Measuring Sustainable Development, Robert Prescott-Allen, Island Press 2001). Indices of human and ecosystem well-being are based on expert assessments of relevant indicators for national and international comparisons.

Clues to Community Survival–20 Indicators of Community Resilience, Heartland Center for Community Leadership, Luther and Wall (1998)
 A set of 20 indicators is presented based on case studies of rural communities in rural Nebraska (Luther and Wall 1998). Indicators include evidence of women in leadership roles, sound and well-maintained infrastructure, strong multi-generational family orientation, and 17 others. Many of the indicators are related to community perceptions such as a strong belief in education that would require local data collection.

Sierra Nevada Ecosystem Project–Community capacity framework, Kusel (1996)
 Determinants in the framework include: social capital, human capital, infrastructure, and natural capital.

Indicators of Forest-Dependent Community Stability: The Evolution of Research, Beckley and Burkosky (1999)

A summary of a series of national and international expert-based approaches to indicators development in the 1990s.

Canadian Council of Forest Ministers (1997)

At this council, representatives compiled a list of criteria and indicators of sustainable forest management.

The Community Resilience Manual: A Resource for Rural Recovery & Renewal, Centre for Community Enterprise (1998)

This organization compiled a research-based model listing 23 community resilience characteristics such as sense of attachment and strong community partnerships. The Centre developed *The Community Resilience Manual: A Resource for Rural Recovery & Renewal for Rural Communities*.

3.1.5. Examples of bottom-up approaches to social indicator selection

An alternative to top-down approaches of developing social indicators is for communities to identify social indicators that are directly linked to local goals. Parkins and colleagues have used this approach in several regions of western Canada. Most recently, the communities of McBride and Valemount, B.C. were involved in an initiative to develop community-defined indicators of sustainability in the Robson Valley (Parkins *et al.* 2004). Through a series of workshops, household surveys, and a review of secondary information such as local strategic plans, a set of community goals was defined for each community. A series of indicators was then identified to measure progress toward these goals, as shown in Table 7.

Table 7: Social indicator framework for the Robson Valley

Community Goals	Indicators
Sustain natural amenities	Natural resources (hiking trails, etc), aesthetic quality
Maintain active community living	Local recreation activities
Maintain community capacity	Sense of place, family oriented community, social capital, human capital, community control in decision making
Maintain modern services	Service infrastructure, accessibility of services
Increase community economic diversity	Diverse economic base, low economic leakage, progressive industry base (moving toward certification), alternative forestry, entrepreneurship
Enhance individual economic well-being	Unemployment rate

Another example of a bottom-up approach is the process used by the District of Campbell River, B.C. municipal planning department to develop indicators for its Official Community Plan (OCP). Starting in the 1990s, the District sponsored community meetings and small groups of citizens created a list of indicators to measure the success of reaching the goals of the OCP. The indicators were selected because they reflected values and priorities of the community. Other examples of the bottom-up indicator selection approaches can be found in published research

involving communities in the Prince Albert Model Forest (Parkins and Stedman 2001; Parkins *et al.* 2001).

The bottom-up approach to indicator development has the advantage of being more connected to the unique social and economic situation of a community or region, but it is also problematic in several ways:

1. Since secondary data (such as data from Statistics Canada) can often only be used for a few of the selected indicators, considerable resources are required for primary data collection.
2. Data from one community are likely not compatible with other locales, making comparisons difficult.
3. Some indicators are more experimental, and do not have strong theoretical or conceptual grounding.
4. Community indicators may not be completely compatible with land use planning goals. This approach is useful, however, in attempting to link the local goals and aspirations of forest communities with land use planning goals.

“Top down” meets “bottom up”

The use of this framework in the Morice and Lakes IFPA mentioned in Section 3.1.3 illustrates an approach that combines top-down indicators with bottom-up indicators. Indicators are selected from the literature and are also derived through local household surveys. This “top-down-meets-bottom-up” approach could be adapted by land use planning and the SEEAs, where the top-down structure frames the development of indicators, but local level consultation and/or data collection guide the process of developing indicators relevant to local circumstances and priorities.

3.1.6. Choosing indicators for land use planning in BC

Planners in B.C. have an extensive array of indicators to choose from. There are several projects underway to catalogue the wide array of indicators and provide a menu of indicators for planners. Von Mirbach identified a reference guide for local-level indicators within the Canadian Model Forest Program (2000). More recently, McHugh *et al.* have developed an extensive searchable on-line database of indicators (McHugh, Gough and Innes, no date; <http://sustain.forestry.ubc.ca>). These lists contain hundreds of indicators with associated rationales and methodologies. A list of indicators used by municipalities is available on the Environment Canada—Sustainable Communities Indicators Program Web site (http://www.ec.gc.ca/soer-ree/English/scip/guidelines.cfm#list_indicator).

Although these lists provide a wide selection of potential indicators and help in identifying the commonalities across various indicator initiatives, the databases do not describe theoretical frameworks. There is an assumption that practitioners can choose from a smorgasbord of potential indicators that might be relevant within a particular land use context. Selection is limited to a judgment call regarding the “best fit” by the practitioner but it’s also left to the practitioner to ascertain how or if the indicator is supported by research.

According to several experts consulted for this review, a better option is to focus first on selecting an indicator framework as discussed above and then select indicators that are consistent with the framework. Frameworks link indicators to sociological or systems theory and give the selection of indicators a structure. The state of science on social indicators, especially related to land use and land management, is still emerging, and there are differences across disciplinary lines about various theories and their associated indicators. Additionally, the criteria for selection of indicators will strongly influence the indicators selected. An initial suite of indicators is required to begin the dialogue on their application in land use planning processes and SEEAs.

It is recognized that while academics debate the theories and foundations of various indicator frameworks through the literature, land use planners, implementation committees, and stakeholders must choose indicators so they can track changes resulting from land use change and land use planning. Experts recommended that planners choose indicators that fit within one of the frameworks rather than choosing indicators “ad hoc.” The notion is that using a theory-based framework will provide more reliability and validity to the indicators, whatever framework is used.

Both the community resiliency and community capacity frameworks reviewed for this project are well supported by research. The frameworks allow for a selection of indicators using both top-down and bottom-up indicator selection approaches, and allow for a mix of secondary data from sources such as Statistics Canada, as well as collection of primary data on indicators at the local level.

The MacKendrick and Parkins (2004a) framework may be most appropriate for the SEEAs since it represents a synthesis of other frameworks, and is based on community capacity-related indicators that closely match the indicators already used in most of the SEEAs to date. The authors of this framework do not prescribe a set of standard indicators that accompany the framework, but offer a menu instead. Some of the data for these indicators are readily available from existing sources, while others would need to be obtained through community surveys and other local data collection.

All experts consulted in this review and in the literature review agreed that population, employment, and income statistics have a part in telling the story of a human condition in a geographic area. Where experts differ, however, is the relative emphasis on the importance of other “process indicators” such as social capital and sense of place as determinants of the human condition. A sociological viewpoint would likely advocate for process indicators because proponents believe that these social conditions enable economic conditions. Economic viewpoints may believe that economics drives social conditions. Others may believe that the relationships are not linear—that economics and process indicators interact and influence each other.

The indicator set being suggested for the coastal B.C. Ecosystem Based Management (EBM) Framework could be reframed within the framework suggested by MacKendrick and Parkins (2004a). Indicators drafted as of May 30, 2005 include population change, protection of cultural/spiritual-valued land, unemployment rates, average incomes, life expectancy, and infant mortality rates. Table 8 shows how existing EBM social indicators fit into the MacKendrick and Parkins model. Note that to date, no indicators have been developed yet that fit into the social capital,

civic vitality, and process indicators in the framework. To be consistent with MacKendrick and Parkins framework, planners should select indicators in these categories.

Table 8: Hypothetical framework for EBM social indicators using MacKendrick and Parkins (2004a) framework based on existing draft indicators

Variables	Indicators
Community assets (resources)	
Natural capital	
Economic capital	
Human capital	\$ in training allocated between local communities
Social capital	- not yet developed -
Community outcomes (goals)	
Ecological integrity	
Economic vitality	Unemployment rate Percentage of population on employment insurance and income assistance Average income Population change
Civic vitality	- not yet developed -
Physical & mental health	Average life expectancy Infant mortality rates
Recreation	Percentage of high ROS land protected, percentage of cultural/spiritual valued land protected
Process indicators	- not yet developed -

Given that budgets for local data collection are typically very limited, data collection tools such as Participatory Rural Appraisal and Rapid Rural Appraisal, which have been used extensively in the international rural development arena at low cost and in short timelines (see Townsley 1996 and World Bank, no date), could be adapted for primary data collection in B.C. Organizations such as municipal governments, regional district planning departments, universities, and tribal organizations could work together to collect local-level data that serves multiple purposes, thus reducing costs for any one organization.

Using the frameworks developed through the experience of many social indicator projects relating to community sustainability and the availability of literally hundreds of potential social indicators mentioned above, land use planners and stakeholders in B.C. can begin applying a framework to guide the identification of social indicators within the land use planning and SEEA processes. This framework can take advantage of social science theories, while still providing for local priorities to drive the selection of some indicators. Secondary sources such as B.C. Stats and Statistics Canada can be tapped for profile indicators, while primary data can be obtained for process indicators.

3.2. Sources of secondary data

The following includes commonly used sources of secondary data for indicators in Canada. A table listing more social indicators available from each of these sources is in Appendix D).

3.2.1. Statistics Canada

Statistics Canada is the primary source of data for many indicators used in community social and economic assessments. The data are historically comparable, comprehensive, community specific, and widely available. Other sources, such as those collected by provincial agencies and local organizations, frequently draw from Statistics Canada to compile their databases. Data is available by census subdivision (community level), census division (regional district), province, and national. While Statistics Canada data is excellent for profile indicators that measure human capital, it does not collect data on social capital or process indicators.

Two useful sources of information available through Statistics Canada include the following:

CANSIM (Canadian Socio-economic Information Management System)

The CANSIM database contains tables of socio-economic statistics that have been collected and compiled by Statistics Canada. The data tables are organized into 23 topics, such as the following:

- Health (physical and mental health)
- Justice (crimes, offences, victims, and police services)
- Social conditions (shelter for victims of abuse, poverty, social behaviour)

Data are available for purchase at national and provincial levels. Custom tabulations for smaller geographic levels may also be ordered and purchased. Financial and economic data are not usually available because of confidentiality at local levels.

Rural and Small Town Canada Analysis Bulletins

Published on-line by Statistics Canada, Rural and Small Town Canada Analysis Bulletins focus on population trends in rural Canada and covering topics such as demography, health, education, manufacturing and labour, household and family. While they do not provide data on indicators specific to geographic areas (except for some large-scale maps), they do summarize trends on indicators such as social engagement and civic participation (Turcotte 2005), socio-economic characteristics of communities with demographic decline, stability or growth (Mwansa and Bollman 2005), and migration patterns between rural and urban communities (Rothwell et al. 2002) that can be used for comparison purposes.

3.2.2. B.C. Stats

B.C. Stats provides social statistics by regional district, municipality, Local Health Area, college region, and school district. Indicators such as population, age, and gender distribution, values of building permits, percent of population by age

receiving income assistance and employment insurance, residential assessments are searchable by regional district and municipality.

For a fee, B.C. Stats will develop socio-economic profiles on request. Income assistance and employment insurance rates indicators can be calculated.

3.2.3. B.C. Progress Board

B.C. Progress Board provides social, economic, and environmental statistics by census metropolitan areas (CMA), developmental region, and health authority for 18 indicators in two categories: economy, innovation and education; and, environment, health, and society. Social indicators include income assistance, unemployment insurance claims, low birth weight, crime statistics, life expectancy, poverty rates, high school graduation rates, university completion rates, and employment rate and other economic data. The B.C. Progress Board reports annually.

3.3. Composite indicators (Indices)

The incorporation of indicators of social impacts into composite social indices has been the subject of considerable effort in North America since the late 1960s. Over the past decade, literally hundreds of indices have been developed to measure social change at international, national, and local scales by governments, institutes, non-profit organizations, and others. Most indices are not linked to natural resource or land use, but some include environmental variables.

Composite social indicators have been used by international organizations such as the Organization for Economic Cooperation and Development (OECD), the World Bank, and the United Nations for measuring progress in less developed countries, as well as many national and local initiatives in the U.S. and Canada such as the Index of National Civic Health (U.S. National Commission on Civic Renewal), the Quality of Life Index Project (30 urban agencies in Ontario), and the City of Edmonton's Social Health Index.

To fully determine the appropriateness of these indices for adoption for land use planning in British Columbia, the methodology, history of use, scales, assumptions, limitations, and academic critiques should be researched and reviewed carefully for each index. The following Sections summarize some of the key indices in use that could be considered for review.

The Canadian Sustainability Index Network website provides a host of social and indicators and indices (<http://www.csin-rcid.ca/resources.aspx>) in addition to the following:

3.3.1. The Canadian Index of Well-being

In a publication released in March 2007, the Atkinson Foundation announced the development of a new well-being indicator framework (<http://www.ciw.ca>) recently established by a national (Canadian) network of academics and practitioners that is based on the most current science on community and individual well-being. The framework includes seven areas that are under development by a national network of indicator experts who expect to develop a composite index for the variables, including the Institute for Social Research and Evaluation at the University of

Northern British Columbia and 18 other institutions across Canada. The variables include: living standards, time allocation, healthy populations, ecosystem health, educated populace, community vitality, and civic engagement. While a composite index has not yet been developed, this initiative represents one leading-edge indicator development effort currently under way in Canada.

3.3.2. BC Stats Socio-economic Index

The BC Stats Socio-Economic Index compiles a variety of indicators into a single composite index for each region within the province. The index is intended to show differences between geographic areas and is not be used as measure of differences over time within a region or community. The overall Regional Socio-Economic Index is a weighted average of each of the six sub-indices below. These include:

- Index of Human Economic Hardship
- Index of Crime
- Index of Health Problems
- Index of Education Concerns
- Children at Risk
- Youth at Risk

These indices are available for each of the 78 Local Health Areas, 26 Regional Districts, 15 College Regions, 57 School Districts, 16 Health Service Delivery Areas (which is an aggregation of an LHA) or five Health Authorities (aggregations of Health Service Delivery Areas) as well as Georgia and Fraser Basins because of their unique ecological factors.

The complete list of the variables that make up these indices is found in Appendix B.

3.3.3. The Human Development Index

In the area of international development, the United Nations' Human Development Index (UNDP HDI) has become one of the most widely accepted indicators. The HDI is based on a definition of human development that is characterized by the UNDP as "an expansion of choices" (UNDP 2006). Three aspects of well-being comprise the HDI: health, knowledge, and access to material goods. These three dimensions are identified by the UNDP as necessary for the making of meaningful choices by individuals, which requires reasonable levels of health and longevity, literacy, some level of education, and a minimal level of material well-being. While it is widely used internationally, the Human Development Index has been used primarily as a tool for comparing jurisdictions rather than for tracking changes over time (Reed 2000). Its utility for regional analysis was not examined for this report.

3.3.4. First Nations Indices

Based on the UNDP HDI, the Registered Indian Human Development Index (HDI) was developed by Indian and Northern Affairs Canada (INAC) to measure the well-being of Registered Indians using Statistics Canada census data to measure three

indicators (a long and healthy life, knowledge, and a decent standard of living). A life expectancy index, an education index, and a per capita income index are combined to create a consolidated human development index. The HDI measures average levels of well-being among Registered Indians at the national and regional levels.

The First Nations Community Well-being Index (CWB) was developed in 2005 as a complement to the Registered Indian Human Development Index and measures the well-being of individual First Nations communities. The CWB was calculated using data derived from national census data. Four indicators (education, labour force activity, income, and housing) were combined to give each community a well-being score. (See <http://dsp-psd.pwgsc.gc.ca/Collection/R2-400-2005E.pdf>). In a review of the First Nations Community Well-being Index, Cooke (2005) states that the indicators in the CWB index are well chosen, but concedes that Census undercoverage of Aboriginal people has been long identified as a problem, leading to possible reliability problems. Nonetheless, Cook says, this index offers a way to compare Aboriginal and Non-Aboriginal communities over a long time period.

3.3.5. Socio-economic Resiliency Index

In the recent literature on land-based programs, Harris *et al.* (1998) developed a socio-economic resiliency index based on a composite measure of social and economic indicators, including resident perceptions of aesthetic attractiveness, proximity of outdoor amenities, level of civic involvement, effectiveness of community leaders, diversity in the economy, and social cohesion. Published in the *Journal of Forestry*, discussion of this index is directly linked with natural resource management-based interventions and development. This scale includes variables that describe resident perceptions as a valid indicator of a community's capacity to adapt to change. A high index score implies greater ability for a community to adapt to change in "positive and constructive ways."

3.3.6. Genuine Progress Index

Developed by three California researchers in 1995, the Genuine Progress Index (GPI) is an index that was developed in light of the limitations of Gross Domestic Product in accurately measuring all the aspects of societal progress and well-being. The GPI assigns a value to environmental quality, population health, livelihood security, equity, free time, and educational attainment and consists of indicators and measures of progress and assessments of the economic value of non-market social and environmental assets not typically accounted for in economic assessments. The framework accounts for depreciation and economic costs as liabilities.

The GPI Index has been criticized for what is seen as a subjective selection of indicators and judgment of whether certain market and non-market activities are good or bad, as well as difficulties regionalizing the statistics. At the same time, proponents say that the GPI can be used as a supplement to other indicators because it provides additional information about the trends in society that have an effect on overall well-being.

The GPI index is used in several parts of Canada, including by the Pembina Institute for Alberta. There is an organization called GPI Atlantic that promotes and educates about the index in the Atlantic provinces (<http://www.gpiatlantic.org>).

3.4. Logic model of indicators using current indicator frameworks

The following logic model (on page 33) depicts the relationships between land use planning, land-use change, and indicators using the MacKendrick and Parkins indicator framework. The logic model is designed as a flow chart that shows how land use planning has *direct* social impacts (such as civic participation during the process of developing the plan and First Nations involvement in land use decisions) and *indirect* social impacts that result from the land use changes influenced by the planning such as sense of place.

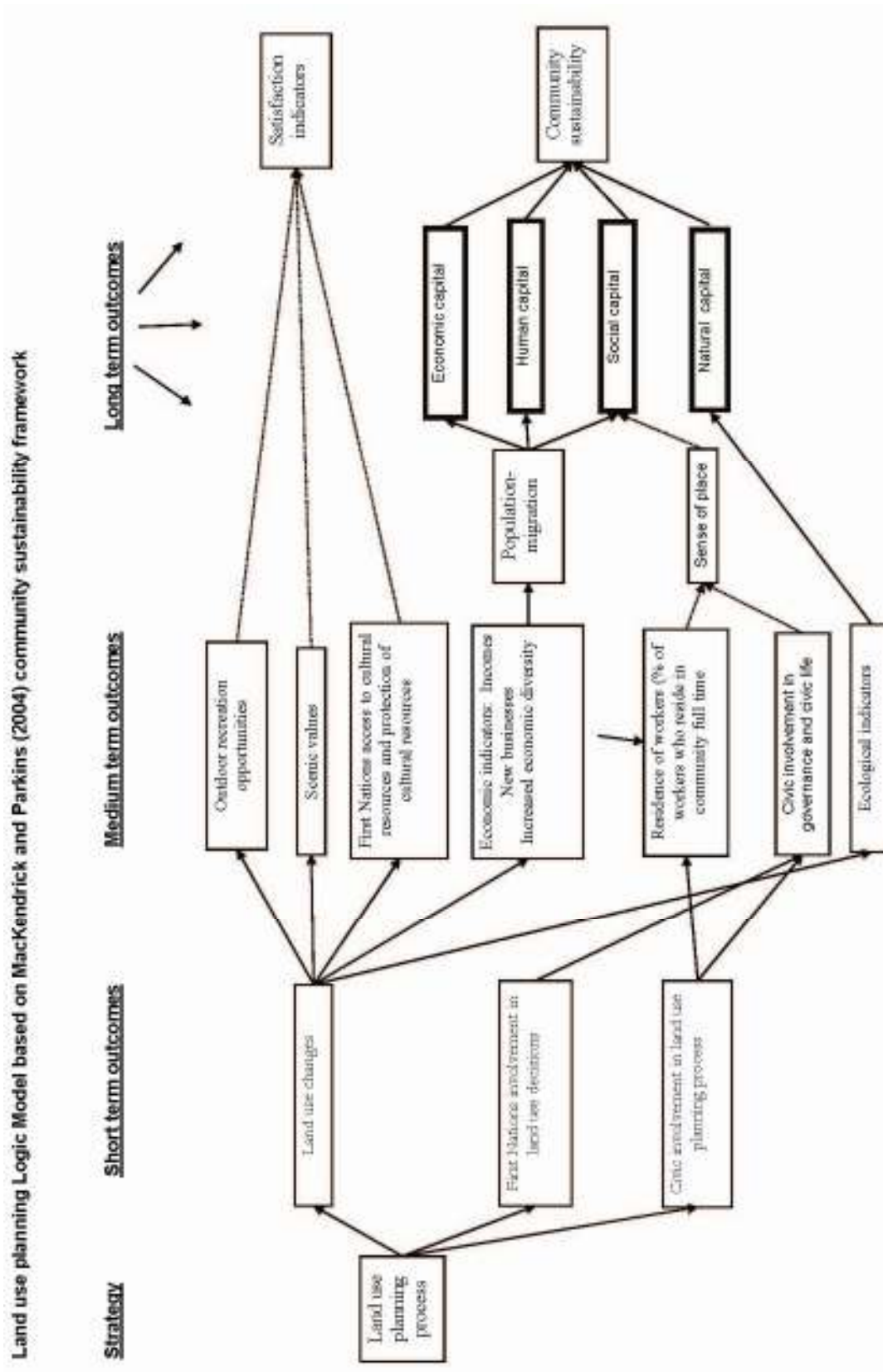
Solid lines between factors described in the chart show direct impacts and dotted lines show indirect or assumed impacts. This chart is only one way to frame the relationships between land use decisions and social impacts, based on the MacKendrick and Parkins conceptual social indicators framework.

In this model, the long-term (high-level) outcomes are community sustainability and satisfaction, shown on the far right side of the model. Shorter-term direct effects from land use planning include change in land use, First Nations involvement in land use decisions, and civic involvement in land use planning. Land use change impacts include outdoor recreation opportunities, scenic values, First Nations access to cultural resources, civic involvement in governance and civic life, as well as a suite of economic indicators.

Worker residence is affected by economic factors reflected in the indicators monitored (type and seasonality of jobs), which in turn affect sense of place. Sense of place is one factor in social capital. Population and migration trends are directly linked to causal economic indicators. All other factors feed into the four types of capital described in the MacKendrick and Parkins indicator framework for community sustainability (refer to Section 3.1.3).

Outdoor recreation, scenic values, and First Nations access to cultural resources could be considered “quality of life” indicators based on perceptions and measured on the basis of satisfaction.

Figure 1: Land use planning logic model.



4. Summary and Recommendations

This review examined existing social indicators used in Social, Economic, and Environmental Assessments (SEEs) and related documents for land use planning in British Columbia and reviewed current literature on social indicators and indices relevant to land use. Key messages from the review include:

- Land use planning is assumed to be an intervention, and that the purpose of developing indicators is to monitor social changes that can be attributed to land use planning and land use change. A secondary purpose of social indicators is to provide a framework for monitoring social changes in a plan area, regardless of the influence of land use planning.
- The greatest challenge in assessing the social impacts of land use planning is the ability to attribute observed social changes to the intervention of land use planning. Given that there are many factors that influence social conditions in a given plan area, the ability to confidently link social change to land use planning is limited. While there are some social indicators that can be directly linked to land use planning, there are also many indirect effects whose linkages are assumed.
- Monitoring social factors in a given geographic area is an important exercise for many good reasons, and land use planning may provide the structure and impetus to do this, whether or not the purpose is explicitly to evaluate the effects of land use planning. However, if the purpose of developing indicators is to assess the impacts of land use planning decisions per se, then isolating these impacts from the other factors that affect social factors is problematic. If assessing land use planning is the purpose of developing social indicators, this forces planners and evaluators to measure only factors they are confident they can link directly to land use planning and accept indirect impacts as theoretical assumptions.
- The review revealed that while the SEEs and related documents referred to many social indicators and concepts, there was a lack of reference to theoretical frameworks for social indicators in the SEEs. Many social indicator terms such as quality of life were included without definitions. The literature agrees that quality of life is based on perceptions and would be measured using primary data collection methods.
- While there are dozens of sources of social indicators and indices in the literature, most were related to social welfare interventions such

as welfare reduction programs, not land-based interventions per se. The leading-edge research on social indicators that would be most relevant to land use planning is emerging from the scientific community for forest-dependent communities led by the Canadian Forest Service, several universities, and the Canadian Model Forest Program.

- Current community sustainability research shows that what might be considered “soft” or “process” indicators, such as sense of place and civic vitality, provide critical insight into the social conditions of a community in addition to “hard” or “profile” indicators such as population and income levels.
- When the purpose of developing and monitoring social indicators is to track changes in economic, social, human and natural capital regardless of whether impacts are associated with land use planning, the literature agrees that process indicators are important to monitor. This is because, when combined with profile indicators, process indicators such as social capital and sense of place provide a more complete picture of the social circumstances of a community than profile indicators alone.
- If the purpose is to evaluate the impacts of land use change that directly result from land use planning decisions, planners can only measure impacts that can confidently be linked to the land use planning exercise. The exception is the measurement of changes that occur directly as a result of the land use planning processes themselves, such as increased civic involvement that occurred with the establishment of regional community resource boards on Vancouver Island following the CORE process.
- According to several experts consulted for this review, assessment processes should focus first on selecting an indicator framework as discussed above and then select indicators that are consistent with the framework.
- Experts and literature consulted for this review agreed that statistics such as population changes, incomes levels, poverty levels, and employment statistics are relevant social indicators, but recent literature and experts advocate for an expanded suite of indicators that include process indicators. If collection of primary data is not possible for budget or logistical reasons, one expert has suggested that (1) population change, (2) incidence of low income (poverty), and (3) education attainment are critical indicators.
- Because data are available at the community level and are consistent across time and across regions, Statistics Canada and BC stats remain the best sources of consistent community and regional and local-level indicator data. BC Progress Board indicators can provide data across different jurisdictions (developmental regions, census metropolitan regions, and health authorities). Fraser Basin Council

data is applicable across communities within the watersheds of the Fraser River.

- To ensure that a suite of indicators reflects the best available social science as well as local context and priorities, indicators that are derived from the literature (top-down) can be combined with indicators that are derived at the local level (bottom-up). Researchers provide the theoretical basis through “conceptual framework;” community members decide which theory-based indicators are most important and practical to measure.
- In addition to helping evaluate land use planning, “top-down-meets-bottom-up” approaches of selecting indicators can provide a valuable resource to communities inside the plan area by giving them indicators to aim for in their local community programming. For example, in the timber-dependent communities of the North Santiam Canyon, Oregon, community members posted the Heartland Center’s “20 Clues to Community Survival” as well as their own list of locally developed indicators on bulletin boards during the 1990s. They also developed community programs to address those indicators. The lists gave community members a common set of targets to aim for and celebrate as improvements were observed over time.
- For indicators that require primary data collection, social science tools that collect primary data, such as Participatory Rural Appraisal and Rapid Rural Appraisal can be adapted from the international rural development field to keep costs of collecting local data at a minimum. Harris *et al.* (1998) used a community self-assessment tool that involved focus groups of opinion leaders who completed self-assessment workbooks and then met for a facilitated focus group interview.
- The MacKendrick and Parkins indicator framework (2004a) may be most appropriate of current indices to use for land use planning in B.C. because it (a) provides a synthesis of other frameworks, and (b) is based on community capacity theories and indicators, which closely match the types of indicators already used in most of the SEEAs to date.
- The BC Social Economics Index is not appropriate for tracking the social change in a geographic area over time. There are other indices such as the Canadian Well-Being Index (in development) as well as the First Nations Community Well-Being Index, but the statistical methodology for each index should be carefully examined to see whether the methods to derive the index have assumptions and limitations that would make it erroneous or misleading to use in the land use planning context. While the Human Development Index (HDI) is widely used internationally, it is not known how relevant it would be for the land use planning context in B.C. given that the HDI is used for assessing change in less-developed countries, and the variables used in the index may not apply. As the Canadian well-

being index is among the most recent sets of indicators, it holds promise for application in B.C.

- Indicators that are equated with “qualitative indicators” may actually be measurable quantitatively. If measures are quantified, they are comparable through time.

Note that domain experts express that no index “does it all,” and it must be recognized that all indices have strengths, weaknesses, and assumptions.

4.1. Recommendations and next steps

It is important to clearly articulate when the purpose of social indicators is to evaluate the impacts of land use planning, or to monitor social changes in a plan area, regardless of the impacts of land use planning. If the purpose is evaluation of land use planning, limit indicator selection to those that clearly link to land use planning, such as outdoor recreation access, First Nations access to resources, scenic values, and economic indicators.

If the purpose to monitor changes in plan areas regardless of land use planning, then broaden the suite of indicators to reflect other profile and process indicators. Use the “top-down-meets-bottom-up” approach to establishing indicators.

Other recommendations include:

- Closely match indicators in SEEAs with the goals and objectives of the associated land use plan. If there are implied social indicators in the land use plan, they should be captured in the SEEAs.
- Explore the literature further for inexpensive methodologies for gathering primary data, such as Rapid Rural Appraisal and Participatory Rural Appraisal.
- Carry out a future project that will carefully examine the various social indicator indexes that may be applicable to land use planning with an eye to assessing their statistical methodologies, assumptions, and level of robustness. The MacKendrick and Parkins’ (2004) framework should be examined specifically as a tool to inform land use planning and land use decisions.
- Experts and the literature were reluctant to recommend a one-size-fits-all suite of indicators, instead offering a menu of options inside a framework. Thus, the recommended suite of indicators relevant to land use planning and SEEAs would follow these principles:
 1. Population, employment, and income statistics have been identified as having a part in telling the story of a human condition in a geographic area.
 2. It would be clear if social indicators are being developed to evaluate the impacts of land use planning, or to monitor social change inside a plan area.

3. Indicators would reflect goals and objectives of the particular land use plan.
4. Indicators would be framed in one of the community sustainability frameworks (such as MacKendrick and Parkins 2004a).
5. Indicators would be developed as quantitative measures (even those that appear “qualitative” can be framed to have quantitative measures) so they can be compared over time.
6. Depending on the goals and objectives of the land use plan and local input, a suite of indicators in an SEEA could include social indicators such as the following. Some are available from secondary sources, while others would require surveys or focus group (primary data collection) (adapted from MacKendrick and Parkins 2004a).
7. Examine the utility of the United Nations’ Human Development Index (UNDP HDI) to bring a more global comparative to regional analysis.
8. Research and explore the opportunity to use the First Nations Community Well-being Index (CWB) that was developed as a complement to the Registered Indian Human Development Index and measures the well-being of individual First Nations communities.
9. In examining potential indices, review the methodology used to derive the index, as well as the assumptions and limitations of the index. Explore other potential social indicator indices identified in the report.
10. Consider identifying “process” indicators and implementing survey methods to determine local performance in a plan area.

Recommended indicators to consider in each of the system areas include the following:

Human capital

Some examples of Human Capital indicators relevant to land use plan implementation are listed below:

- Health statistics and access to health care
- Population
- Employment and income trends (including EI and IA claims and incidence of low income)
- Education levels, school attendance, graduation rates and training programs

Social Capital

Some examples of Social Capital indicators relevant to land use plan implementation are listed below:

- Average number of years in community
- Migration history, projections of future migration
- Community cohesion (e.g., percentage of those feeling that they can rely on others)
- Evidence of existing social networks (for communication, community projects, resource preservation)
- Memberships in community organizations
- Number of community organizations
- Satisfaction about living environment (sense of place determinant)
- Perceptions of connectedness to place (sense of place determinant)
- Perceived ability to work together to mobilize resources
- Presence of groups already in place for a common community goal
- Local representatives in provincial or federal government
- Religious institutions

Civic Vitality

Some examples of measures of Civic Vitality currently considered as relevant to land use plan implementation are listed below:

- Personal identification with community
- Satisfaction with community services
- Perceptions and trust of local government
- Evidence of trust among parties... particularly between local government and citizens

Physical and Mental Health

Some examples of Mental Health indicators relevant to land use plan implementation are listed below:

- Personal health reports (self-reported)
- Stress (self-reported)
- Infant mortality and mortality rates, and life expectancy
- Health statistics such as alcohol consumption

Recreation

Potential Recreation indicators relevant to land use plan implementation are listed below:

- Local recreation opportunities and facilities (indoor and outdoor)
- Outdoor recreation infrastructure

Process indicators

Some examples of process indicators relevant to land use plan implementation are listed below:

- Sense of place
- Women in leadership roles, entrepreneurship
- Perceptions of effective leadership in community

5. References

- Atkinson Charitable Foundation. 2007. Canadian index of well-being: Measuring what matters. Accessed at <http://www.ciwa.ca> March 22, 2007.
- Bauer, R.A. 1967. Social indicators. Cambridge, MA: M.I.T. Press.
- SIMFOR. Social indicators used in Model Forests. Accessed at <http://fms.nofc.cfs.nrcan.gc.ca:8080/simfor/main.htm> on March 17, 2007.
- Beckley, T.M., S. Nadeau, E. Wall, and D. Martz, 2002a. Multiple capacities, multiple outcomes: Delving deeper into the meaning of community capacity. Paper presented at the Annual Meeting of the Rural Sociological Society.
- Beckley, T.M. and T.M. Burkosky. 1999. Social indicator approaches to assessing and monitoring forest community sustainability. Northern Forestry Centre Information Report NOR-X-360. Edmonton, AB.
- Beckley, T., J.R. Parkins and R. Stedman. 2002b. Indicators of forest-dependent community sustainability: The evolution of research. *The Forestry Chronicle*, Sept/Oct, Vol. 78, No. 5, 626–636
- Bowles, R.T. 1981. Little communities and big industries: Studies in the social impact of Canadian resource extraction. Toronto. Butterworths.
- British Columbia Stats. 1997. Genuine progress indicator? in Infoline newsletter Issue 97–19. Accessed at <http://www.bcstats.gov.bc.ca/releases/info1997/in9719.pdf> on March 22, 2007.
- Canadian Council of Forest Ministers. 2005. Criteria and indicators of sustainable forest management in Canada: National status 2005. Natural Resources Canada, Ottawa, ON.
- CCFM (Canadian Council of Forest Ministers). 1997. Criteria and indicators of sustainable forest management in Canada. Technical Report. Natural Resources Canada, Ottawa, ON.
- Centre for Community Enterprise. Community Resilience Manual. Accessed at: <http://www.cedworks.com/communityresilience01.html> on March 23, 2007.
- EEA (European Environmental Agency), Glossary, Accessed at: http://glossary.eea.europa.eu/EEAGlossary/S/social_indicator on March 22, 2007
- Force, J.E. and G.E. Machlis. 1997. The human ecosystem Part II: Social indicators in ecosystem management. *Society and Natural Resources* 10:369–382.
- Hagen, J. 1992. An entangled bank: The origins of ecosystem ecology. New Brunswick, NJ: Rutgers University Press.
- Harris, C., W. McLaughlin, and G. Brown. 1998. Rural communities in the interior Columbia Basin: How resilient are they? *Journal of Forestry* 96(3):11–15.

- Helliwell, J. 2002. Socio-economic and environmental analysis in British Columbia Land Use Planning. Forest Renewal BC.
- Kusel, J. 1996. Well-being in forest-dependent communities, part I: A new approach. Sierra Nevada Ecosystem Project: Final Report to congress. No. 39. Wildland Resources Center Report. University of California, Davis.
- Kaufman and Kaufman. 1946. Toward the stabilization and enrichment of a forest community. The Montana Study. University of Montana. USDA Forest Service, Region One, Missoula, MT.
- Kline, Elizabeth. 1996. Why sustainable community indicators? People need A reality check. Wingspread Journal 18:2. Accessed at: <http://www.smartcommunities.ncat.org/articles/whysust.shtml> on March 22, 2007.
- Korber, D. and R. Rasker. 2001. Measuring Change in Rural Communities: An Economics Workbook for Western Canada. Sonoran Institute, Bozeman, MT.
- Lee, R.G. and Eckert, P.J. 2002. Establishment size and employment stability in logging and sawmilling: a comparative analysis. Canadian Journal of Forest Research 32(1):67–80.
- Lucas, R.A. 1971. Minetown, milltown, railtown: Life in Canadian communities of single industries. University of Toronto Press, Toronto, ON.
- Luther, V. and M. Wall. 1998. Clues to rural community survival. Heartland Center for Leadership Development, Lincoln, Nebraska.
- Machlis, G.E., J.E. Force, and W.R. Burch. 1997. The human ecosystem Part I: The human ecosystem as an organizing concept in ecosystem management. Society and Natural Resources 10: 347–367.
- Marchak, M.P. 1983. Green Gold: the industry in British Columbia. University of British Columbia Press, Vancouver, BC.
- MacKendrick, N.A. and J.R. Parkins. 2004a. Frameworks for Assessing Community Sustainability: A Synthesis of Current Research in British Columbia. Northern Forestry Centre Information Report. NOR-X-392, Edmonton, AB.
- MacKendrick, N. and J.R. Parkins. 2004b. Indicators of community sustainability for the Morice and Lakes IFPA Region, British Columbia.
- Mwansa P.B. and R.D. Bollman. 2005. Community demographic trends within their regional context Rural and Small Town Canada Analysis Bulletin, Statistics Canada Catalogue no. 21-006-XIE, Vol. 6, No. 3.
- Innovative Forest Practices Agreement, Prince George, BC. Accessed at: <http://www.moricelakes-ifpa.com/publications/index.html> on March 22, 2007
- McHugh, A., A. Gough and J. Innes. Indicators of sustainable forest management: Review of potential indicators. Sustainable Forest Management Laboratory, Faculty of Forestry, UBC. <http://www.sustain.forestry.ubc.ca>
- National Round Table on the Environmental and Economy (NTREE). Accessed at <http://www.nrtee-trnee.ca/> on March 27, 2007.

- Parkins, J.R., J. Varghese and R.C. Stedman. 2001. Locally defined indicators of community sustainability in the Prince Albert Model Forest. Northern Forestry Centre Information Report NOR-X-379. Edmonton, AB: Canadian Forest Service.
- Parkins, J.R., J. Varghese and R.C. Stedman. 2004. Identifying indicators of community sustainability in the Robson Valley. BC Journal of Ecosystems and Management 4(2). <http://www.forrex.org/publications/jem/jem.asp?issue=24>
- Parkins, J.R. and T.M. Beckley. 2001. Monitoring community sustainability in the Foothills Model Forest. A social indicators approach. Atlantic Forestry Centre Information Report AFC M-X-211E. Fredericton, NB: Canadian Forest Service.
- Parkins, J.R., R.C. Stedman, and J. Varghese. 2001. Moving towards local-level indicators of sustainability in forest-based communities: A mixed-method approach. Social Indicators Research 56:43–72.
- Putnam, R. D. 1993. Making democracy work. Civic traditions in modern Italy. Princeton, NJ: Princeton University Press.
- Putnam, R.D. 2000. Bowling Alone: America's Declining Social Capital, Simon and Schuster.
- Rondeau, D. 2002. A review of socio-economic and environmental impact assessment for land and resource management planning in British Columbia. Final guidelines for multiple accounts analysis. A report to the Ministry of Sustainable Resource Management.
- Reed, P. 2000. Developing civic indicators and community accounting in Canada. Statistics Canada and Carleton University. Accessed at: http://www.cedworks.com/files/pdf/free/Developing_Civic_Indicators01.pdf on March 22, 2007
- Rothwell N., R. Bollman, R. J. Tremblay, and J. Marshall. 2002. Migration to and from rural and small town Canada. Rural and Small Town Canada Analysis Bulletin Catalogue no. 21-006-XIE, Statistics Canada, Vol. 3, No. 6.
- Scarfe, B. 2002. Socio-economic and environmental impact assessment for land and resource management planning in British Columbia. Report for B.C. Ministry of Sustainable Resource Management.
- Sheppard, S.R.J., H.W. Harshaw, and J.L. Lewis. 2005. A review and synthesis of social indicators for sustainable forest management. BC Journal of Ecosystems and Management. Submitted.
- Steckler, B. 2007. Oregon Department of Land Conservation and Development. Personal communications.
- Stedman, R.C. 1999. Sense of place as an indicator of community sustainability. The Forestry Chronicle 75(5):765–770.
- Turcotte, M. 2005. Social engagement and civic participation: Are rural and small town populations really at an advantage? Rural and Small Town Canada Analysis, Statistics Canada, Bulletin Catalogue no. 21-006-XIE, Vol. 6, No. 4.
- Townsley, P. 1996. Rapid rural appraisal, participatory rural appraisal, and aquaculture, Food and Agriculture Organization of the United Nations, accessed at <http://www.fao.org/DOCREP/006/W2352E/W2352E00.HTM>.

- Von Mirbach, M. 2000. A user's guide to local level indicators of sustainable forest management|: Experiences from the Canadian Model Forest Network. Natural Resources Canada, Canadian Forest Service, Ottawa, ON.
- United Nations Development Group. 2006. Human development report. Accessed at <http://hdr.undp.org/hdr2006/statistics/> on March 20, 2007.
- World Bank Group. Participatory rural appraisal. Accessed at <http://www.worldbank.org/wbi/sourcebook/sba104.htm> on March 23, 2007.

6. Appendix A

Social Indicators/Indices

Table 9: Social indicators/indices discussed in SEEAs and related documents. Key indicator words are bolded in this table.

Name of SEEA	Social Indicators/indices discussed
Vancouver Island Summary Land Use Plan Socio-Economic And Environmental Considerations (website: year unknown)	<ul style="list-style-type: none"> • recreation by local residents and "existence values" (i.e., the value placed on preserving wilderness areas for future generations). • scenic quality <p>Implied: population mobility (out-migration)</p>
Haida Gwaii SEEA of Haida Gwaii/QCI Land Use Viewpoints 2006	<p>Community stability (Variables include: Community capacity building, local empowerment, and stakeholder consensus)</p> <p>Also refers to:</p> <ul style="list-style-type: none"> • well-being • community stability (linked with economic indicators) • community resilience (population by community, Haida population, % of jobs held by local residents and school enrolment) • quality of life indicators (recreation opportunities, viewscapes, and water and air quality) • Cultural/historical, and archaeological indicators (protection of cultural heritage resources, including availability of botanicals. Access to food gathering activities, botanical forest products, and fishing/hunting opportunities. <p>Implied: -- land use certainty ("land use certainty benefits")</p>
Peace Moberly Tract: Base Case 2006	<p>Refers to five basic accounts under Multiple Accounts Assessment:</p> <ul style="list-style-type: none"> • Environmental • Social • Economic development • Provincial government revenue • Net economic benefit <p>Expresses social well-being account in NPV (\$) terms in a table. No estimates have been provided for ecosystems service function and cultural values because of the difficulty in obtaining dollar values for them.</p> <p>Social indicators:</p> <ul style="list-style-type: none"> • population • public recreation and use • well-being (does not define) • family income (list as economic factor) <p>First Nations indicators:</p> <ul style="list-style-type: none"> • Cultural, sustenance values maintained • First Nations defined ecosystem integrity as a cultural value. • Dollar value of food and firewood replacement cost

<p>Sea to Sky Land and Resource Management Plan (LRMP) Socio-Economic Base-Case Update 2005</p>	<ul style="list-style-type: none"> • population • community sustainability (refers to economics) • community resiliency (does not define) • refers to Local Health Area measures of economic hardship, crime, education, health, and children and youth at risk measures • “protection of First Nations values” (does not define)
<p>Morice Land and Resource Management Plan SEEA: Morice LRMP Table Final Land Use Recommendations 2004</p>	<p>SEEA is organized by economic sector (forestry, minerals and energy, backcountry tourism). However there are sections called “Assessment of Plan on Communities/Settlements” and “First Nations.”</p> <p>In the “Conclusions” section of the report, there is a section called “Social impacts” that refers to (but does not define) community capacity building, local empowerment, and community resilience.</p> <p>This SEEA profiles population demographics, labour force, income dependencies, community sustainability. These are based on a suite of indicators used by the Morice IFPA. Social-related indicators from the IFPA include:</p> <ul style="list-style-type: none"> • human capital (education, trades training, perceived choices for employment and education opportunities) • social capital (number of community volunteer organizations, in/out migration etc.) • civic vitality (satisfaction with local government, volunteerism, etc.) • physical and mental health (health care, substance abuse etc.) • recreational opportunities (quality of outdoor and indoor recreational opportunities)
<p>North Coast Socio-Economic and Environmental Assessment of LRMP Scenario developed by the North Coast LRMP Table as of April 2004 Volume I: Socio-Economic Analysis 2004</p>	<ul style="list-style-type: none"> • population trends (out-migration) • income assistance, and employment insurance by age group • employment sectors • First Nation access to plan area resources. • protection, which have important cultural and natural values (FN)
<p>West Babine Sustainable Resource Management Plan SEEA 2004</p>	<p>Section called Regional Quality of Life</p> <ul style="list-style-type: none"> • employment—number of jobs • recreation access
<p>Eight Peaks Winter Recreation Sustainable Resource Management Plan SEEA 2003</p>	<ul style="list-style-type: none"> • population • seasonality of work and impacts on social fabric of community • residence of work force • age of work force • housing and other services • communications and other community infrastructure • public services • incomes • general well-being (including recreational opportunities but otherwise not defined)
<p>SEEA of the Draft Rocky Mountain Management Plan 2003</p>	<p>SEEA is organized by economic sector. Refers to use-related values (e.g., recreation, food gathering, air and fresh water) and existence-related values. Demographic, local government and community concerns (but not defines except:</p> <ul style="list-style-type: none"> • Vulnerability to product boycotts or production disruptions will likely be reduced • Willingness to pay (Contingent valuation) -- how much resident hunters in the Plan Area would be willing to pay for their hunting

	<p>experiences</p> <ul style="list-style-type: none"> • Maintain angling opportunities • First Nations: Preservation of archaeological and cultural sites. • Settlement redistribution
Kalum Land and Resource Management Plan SEEA Final Report 2002	<p>Socio-Economic Assessment Summary Matrix includes categories (“accounts”) by economic sector, including mining, energy, forestry, government revenues, but also categories for Community and First Nations issues.</p> <p>Under community:</p> <ul style="list-style-type: none"> • water quality and quantity • population growth <p>Under First Nations:</p> <ul style="list-style-type: none"> • increased First Nation involvement in resource management planning • protection of traditional hunting, fishing, trapping and food/medicinal plants, sustenance activities and archeological resources
Central Coast Land and Coastal Resource (LCRMP) Phase 1 “Framework Agreement” SEEA 2001	<p>Used Socio-Economics Index from BC Stats. Weighted variables included:</p> <ul style="list-style-type: none"> • economic hardship • crime • health • education • children and youth at risk measures <p>Has a Community Concerns Account and First Nations Concerns account but most indicators are economic. Social indicator includes:</p> <ul style="list-style-type: none"> • protection of subsistence activities
Lillooet Land and Resource Management Plan SEEA of Phase 1: Framework Proposals: Final Report 2001	<p>Summary Matrix includes categories by economic sector, including mining, energy, forestry, government revenues, plus First Nations issues and “community concerns and implications.”</p> <ul style="list-style-type: none"> • population change • visual impacts <p>First Nations concerns and implications:</p> <ul style="list-style-type: none"> • traditional nature-based values
Cassiar-Iskut-Stikine LRMP Recommendation Package-SEEA Final Report 2000	<p>Summary Matrix includes categories by economic sector, including mining, energy, forestry, government revenues, plus First Nations issues.</p> <ul style="list-style-type: none"> • Population growth • First Nations cultural values (“protects FN tradition/sustenance activities and sacred sites”) • protection of recreational and scenic values
MacKenzie Land and Resource Management Plan Socio-Economics Assessment of “MacKenzie Draft Recommended Land and Resource Management Plan 2000	<p>Summary Matrix includes categories by economic sector, including mining, energy, forestry, government revenues, plus First Nations issues and “economic impact and community stability.” It appears that community stability is related to economics)</p> <p>Implied social indicators include</p> <ul style="list-style-type: none"> • protect natural and cultural heritage of First Nations <p>Visual quality objectives are discussed but no indicators listed.</p>
Dawson Creek Socio-Economic/Environmental Impact Assessment of Recommended Land Use Plan	<p>Summary Matrix includes categories by economic sector, including mining, energy, forestry, government revenues, and Community and First Nations issues.</p>

1999	<p>Section on Community and First Nations implications section referred to economic diversification, plus:</p> <ul style="list-style-type: none"> • avoidance of unjustifiable infringement of aboriginal and treaty rights/heritage resources. Preservation of key aboriginal values (fish/wildlife, and cultural resources).
<p>Robson Valley Land and Resource Management Plan Section 3.0, SEEA (1999 Web site)</p>	<p>Summary Matrix includes categories by economic sector, including mining, energy, forestry, government revenues, and First Nations and community stability issues.</p> <p>Community stability</p> <ul style="list-style-type: none"> • population out-migration • population growth <p>First Nations concerns</p> <ul style="list-style-type: none"> • participation in resource management, economic development • protection of traditional activities <p>Quality of Life</p> <ul style="list-style-type: none"> • hardship and stress • scenic values • nature-based recreation opportunities <p>There was an implied social indicator in the LRMP itself that was not reflected in the SEEA. "Increase community influenced over resource management and information availability to the public" and "Promote social health" (not defined).</p>
<p>Bulkley Land and Resource Management Plan SEEA 1998 (Web site)</p>	<ul style="list-style-type: none"> • population • community health (not defined) • community wealth (not defined) • worker adjustment (not defined) • quality of life (not defined) <p>First Nations impacts refer to employment, not other social indicators</p>
<p>Fort St. James Recommended Fort St. James Land and Resource Management Plan SEEA 1998</p>	<p>Summary Matrix includes categories by economic sector, including mining, energy, forestry, government revenues, and First Nations issues and "community stability/quality of life"</p> <ul style="list-style-type: none"> • population • wilderness recreation values • income distribution • Protection of cultural/heritage resources and subsistence fisheries and trapping
<p>Prince George Land and Resource Management Plan Reference Document 8.5 SEEA 1998</p>	<p>Summary Matrix includes categories by economic sector, including mining, energy, forestry, government revenues, and First Nations issues and "community stability/quality of life."</p> <ul style="list-style-type: none"> • population • wilderness recreation values • "sense of cooperation by resource users" <p>First Nations issues include:</p> <ul style="list-style-type: none"> • protection of sustenance and cultural activities <p>Implied indicator: conflicts between motorized and non-motorized recreation users in these areas. Needs of Seniors and people with special needs</p>

<p>Fort Nelson</p> <p>Fort Nelson LRMP Socioeconomic & Environmental Assessment of Recommended Land & Resource Management Plan: Community and First Nations implications (1997 Web site)</p>	<p>Summary Matrix includes categories by economic sector, including mining, energy, forestry, government revenues, and First Nations issues.</p> <p>Indicators implicit</p> <ul style="list-style-type: none"> • population • protection of heritage sites and trails, avoiding infringement on aboriginal treaty rights, recognition of spiritual/cultural values, continuity of sustenance and cultural activities • protection of traditional use access.
<p>Fort St. John Land and Resource Management Plan SEEA, Introduction and Overview Summary (1997 Web site)</p>	<p>Impacts are discussed by economic sector (forestry, mining, agriculture etc) but there is a section on Communities and First Nations.</p> <p>In that section, social indicators appear to be</p> <ul style="list-style-type: none"> • population growth • protection of natural and spiritual values important to First Nations.
<p>Lakes District Land and Resource Management Plan Preliminary Socio-Economic and Environmental Analysis of Draft Land Use Plan (Scenario O) 1997</p>	<p>Summary Matrix includes categories by economic sector, including mining, energy, forestry, government revenues, First Nations issues and “community stability/quality of life.”</p> <ul style="list-style-type: none"> • population • sense of community (not defined) • outdoor recreation features and opportunities. <p>First Nation include:</p> <ul style="list-style-type: none"> • Protection of cultural/heritage resources
<p>Vanderhoof Land and Resource Management Plan SEEA of Base Case and Consensus Land Use Plan 1996</p>	<p>Summary Matrix includes categories by economic sector, including mining, energy, forestry, government revenues, First Nations issues and “community stability/quality of life.”</p> <ul style="list-style-type: none"> • population • sense of community and cooperation • scenic beauty • recreational values <p>First Nations indicators:</p> <ul style="list-style-type: none"> • protection of cultural/heritage sites

7. Appendix B

Regional Socio-Economic Index (BC Stats)

Index of Human Economic Hardship

Per cent of population age 0–64 on income assistance - Total
Percent of population age 0–64 on income assistance > 1 year
Percent of population age 0–64 on income assistance < 1 year
Percent of seniors receiving maximum Guaranteed Income Supplement (GIS)
Percent of 19–64-year-olds receiving Employment Insurance (4 quarter average)
Average household income, 2000 (Local Health Areas)
Per capita Income (Regional Districts)
Income inequality (2000)
Per capita net taxes paid (Regional Districts)

Index of Crime

Serious violent crime rates
Serious property crime rates
Total serious crime rate
Number of serious crimes per police officer
Percent change in serious violent crime rate
Percent change in serious property crime rate
Percent change in total serious crime rate
Motor vehicle theft crime rate
Spousal assault crime rate
Non-cannabis drug offences per 100,000 population
Illicit drug deaths per 100,000 pop 19–64
Juvenile serious violent crime rate
Juvenile serious property crime rate
Juvenile non-cannabis drug charges per 100,000 population

Index of Health Problems

Life expectancy at birth
Potential years of life lost due to natural causes
Potential years of life lost due to accidental causes
Potential years of life Lost due to suicide/homicide
Teen pregnancy rate (age 15–17)
Infant mortality rate
Prevalence of smokers, 1997 (Regional Districts)

Index of Education Concerns

Percent of population age 25–54 without high school completion, 2001
*Percent of population age 25–54 without completed post-secondary education, 2001
*Percent of 18-year-olds who did not graduate
*Grade 12 provincial Math exam non-completion rate
Grade 12 provincial Chemistry exam non-completion rate

*Grade 12 provincial English exam non-completion rate
*Per cent of students below standard in Grade 4 Reading, Writing and Math
Percent of students below standard in Reading – Grade 4
Percent of students below standard in Reading – Grade 7
Percent of students below standard in Writing – Grade 4
Percent of students below standard in Writing – Grade 7
Percent of students below standard in Math – Grade 4
Percent of students below standard in Math – Grade 7
Grade 10 provincial English exam non-completion rate
Grade 10 provincial Math exam non-completion rate
Grade 10 provincial Science exam non-completion rate

Children at Risk

Percent of population age 0–18 on Income Assistance > 1 year
Percent of population age 0–18 on Income Assistance < 1 year
Children in care per 1,000 population 0–18
Infant mortality rate
Percent of students below standard in Reading – Grades 4 and 7
Serious juvenile crime rates
Juvenile serious violent crime rate
Juvenile serious property crime rate
Juvenile non-cannabis drug charges per 100,000 population
Hospitalization rates of population 0–14 - respiratory diseases
Hospitalization rates of population 0–14 - injury and poisoning
Teen pregnancy rate (age 15–17)
Child abuse per 1,000 population 0–18

Youth at Risk

Per cent of population Age 19–24 on Income Assistance - Total
Percent of population Age 19–24 on Income Assistance > 1 year
Percent of population Age 19–24 on Income Assistance < 1 year
Percent of 18 year olds who did not Graduate
Total Serious Crime Rate
Smoking rate (age 19–24) (Regional Districts)
Motor Vehicle Accident Hospitalizations (pop 15–24)
Non-Cannabis Drug Offences (per 100,000 pop)
Percent of population age 19–24 receiving Employment Insurance
Net migration of population 18–24 (Regional Districts)

Demographics and Background Information

Population
1 year population growth rate
5 year average annual population growth rate
Percent of population that are Aboriginal, 2001
Percent of population that are visible minorities, 2001
Percent of families with children that are in lone parent families, 2001
Percent of population that are seniors
Income dependency on forestry, fishing and mining, 2000

8. Appendix C

Annotated Bibliography of Key Literature

1. **Parkins, J.R., R.C. Stedman, and J. Varghese. 2001. Moving towards local-level indicators of sustainability in forest-based communities: A mixed-method approach. *Social Indicators Research*, 56:43–72.**

Using a “bottom-up-meets-top-down” approach to social indicators, this study of two Saskatchewan communities used a sustainability framework in which community members selected the indicators within a research-based framework of quality of life. Quality of life was based on the ability to obtain things people desire, perceptions of “the good life.” Researchers caution against using a one-size-fits-all suite of indicators and recommend local processes to define quality of life. Workshops and survey research are used to identify relevant local-level indicators.

2. **Beckley, T., J. Parkins, and R. Stedman. 2002. Indicators of forest dependent community sustainability: The evolution of research., *Forestry Chronicle* 78(5).**

This paper describes the history and development of research related to sustainability of forest communities in Canada as well as indicator development for measuring community sustainability in resource-dependent communities. It provides an explanation of the development of indicator frameworks. The paper asserts that the selection of indicators in many early processes was ad-hoc and not based on theoretical frameworks. It also describes the history of local-level indicator selection in the Canadian Model Forest Program and how local-level indicators were incorporated with community sustainability research. The paper defines indicators which examine social processes and contrasts them from profile indicators that describe “how things are.” The paper describes in detail social process concepts such as sense of place, social capital, and leadership and provides the conceptual models, including community capacity and community resilience frameworks.

3. **Korber, D. and R. Rasker. 2001. Measuring change in rural communities: An economics workbook for Western Canada. Sonoran Institute, Bozeman, MT.**

This reader-friendly workbook is designed for community residents and local planners to quickly produce a socio-economics profile by collecting data from existing secondary sources such as Statistics Canada. It provides step-by-step instructions on how to obtain profile data and analyze trends. The workbook gives significant practical detail on what is available from Statistics Canada and the Standard Industrial Classification system, and how to access it. Indicators are limited to census profile indicators and do not cover social process indicators.

4. **Luther, V. and M. Wall. 1998. Clues to rural community survival. Heartland Center for Leadership Development. Lincoln, Nebraska.**

This book summarizes the findings of case study research in the Midwest U.S. that annotates 20 social process indicator categories that contribute to community resilience. Clearly designed for the practitioner, the book very sketchily describes the methodology but gives significant detail on each of 18 communities included in the case study. Indicator categories are listed, but the book does not describe measures for these indicators. Examples include: evidence of community pride, willingness to seek help from the outside, and strong belief in and support of education.

5. **Force, J.E. and G.E. Machlis. 1997. The human ecosystem part II: Social indicators in ecosystem management. Society and Natural Resources 10:369–382.**

This paper is the foundational piece in the development of the human ecosystem or resiliency model for social indicators, comparing human ecosystems to natural ecosystems. The authors describe their framework for social indicators and give an example of its use in the Upper Columbia River Basin in the U.S.

6. **MacKendrick, N. and J. Parkins. 2004. Frameworks for assessing community sustainability: A synthesis of current research in British Columbia. Information Report NOR-X-392, Canadian Forest Service Northern Forestry Centre.**

These Canadian Forest Service authors developed a synthesis indicator approach using these five community sustainability projects in B.C. and created a new approach that took advantage of the strengths of the individual projects. They include an excellent list of possible indicators for each of four forms of capital and seven outcomes that can be adapted for use in land use planning.

7. **Stedman, R, J. Parkins, and T. Beckley. 2005. Forest dependence and community well-being in rural Canada: Variation by forest sector and region. Canadian Journal of Forestry Research 35: 215-220.**

This study looked at the relationships between forest dependence and education attainment, median family income and poverty, and unemployment and compared the results by region in Canada.

8. **Parkins, J., J. Varghese, and R. Stedman. 2004. Identifying indicators of community sustainability in the Robson Valley, British Columbia. Journal of Ecosystems and Management 4(2)**

This paper describes a bottom-up-meets-top-down process of social indicator development for one forest-based community in the Robson Valley of B.C. where indicators were locally derived and linked to the social science literature. The community capacity framework used human capital, social capital, sense of place, natural capital, and economic capital indicators. Local level indicators were obtained through a survey, workshops, and interviews in the community.

9. **Helliwell, J. Well-being, social capital, and public policy: What's new? 2005. National Bureau of Economic Research, NBER Working Paper Series 11807. Accessed at www.nber.org/papers/w11807.**

This paper discusses the recent research on indicators of well-being (measured by perceived life satisfaction) and suggests that social capital, including trust, is significant determinants of well-being. The paper also asserts that non-financial job characteristics and climate of workplace trust also are significant determinants. It also looked at suicide rates of a country as a possible determinant of life satisfaction, and examined international differences. Helliwell's paper strengthens the argument in favour of using social capital as an indicator in community sustainability and well-being.

10. **Harris, C., W. McLaughlin, and G. Brown. 1998. Rural communities in the interior Columbia Basin: How resilient are they? Journal of Forestry 96(3):11–15.**

Harris's research on community resilience was based on perceptions of resilience among community members in the Interior Columbia Basin of U.S. Pacific Northwest. He used a focus group and self-assessment workbooks to collect data on perceptions in addition to analyzing secondary data from the US Census and state population projections for 198 communities. He developed a community resilience index based on the data based on an aggregate measure of perceptions of community members that used outdoor amenities, level of civic involvement, effectiveness of community leaders, economic diversity, and social cohesion.

11. **Matthews, R. (2005). Using a Social Capital Perspective to Understand Social and Economic Development, Policy Research Institute, Accessed at http://policy.research.gc.ca/page.asp?pagenm=v6n3_art_06.**

This paper published in the Policy Research Initiative (Canadian government) describes the work of the Resilient Communities Project at the University of British Columbia that is looking at social capital formation and the link between social capital and economic development in B.C. Matthews examines the determinants of social capital and ways of measuring social capital.

12. **Cooke, M. 2005. The First Nations Community Well-Being Index (CWB): A Conceptual Review, Strategic Research and Analysis Directorate Indian and Northern Affairs Canada. Accessed at: <http://dsp-psd.pwgsc.gc.ca/Collection/R2-400-2005E.pdf>.**

This paper offers summarizes and critiques the methodology behind the First Nations Community Well-Being Index. While no single quantitative indicator can adequately describe the quality of life in a community, Cooke asserts that the measures that are included in the CWB meet the requirement that an indicator will be a valid measurement for well-being in Aboriginal communities. The paper also offers an excellent overview of 10 other human well-being indices for comparison.

9. Appendix D

Sources of indicators

Source	Web site	Indicators
Statistics Canada (change over time) These data are free at the (provincial, census division and subdivision) at five year intervals	http://www.statcan.ca	Population
		Age distribution
		Gender distribution
		Migration
		Percent migration
		Employment participation rate change (total labour force divided by population over 15)
		Unemployment rates
		Average weekly earning by industry
		Employment by industry
		Wage and salaries
		Percent self-employed
		Gender and place of work
		Mean and median household income
		Mean and median income by gender

		% income by government transfer
		% full time, part time employment
		Incidence of low income by family and unattached individuals
		Average value of dwelling
		% owned, rented dwellings
		National Population Health Survey Overview
		161 tables for factors influencing health
CANSIM Quality of life indicators. Cost is \$3 per time series on line or to purchase full CANSIM database on CD or DVD is \$5,000. Most statistics only available by province or Health Region level	http://www.statcan.ca/english/ads/cansimII/index.htm	physical and mental health (biennial, by Health Region, biennial through Canadian Community Health Survey)
		justice (crimes, correctional services, shelters for victims of abuse) Adult Correctional Services Survey (annual by province) Uniform Crime Reporting Survey (annual by province) Transition Home Survey (biennial, by province)

		Employment Insurance Program (E.I.), number of disqualifications and disentitlements by province, monthly
		Claims received and allowed by province and type of claim, monthly
		Employment Insurance Program (E.I.), benefit payments by province and type of benefit, monthly (dollars)
		Full-time enrolments and graduates in postsecondary community college programs, annually by province
		University enrolments, by registration status, program level, Classification of Instructional Programs, (annual by province)
		University degrees, diplomas and certificates granted (annual by province)
		Registered apprenticeship training, registrations and completions by major trade groups and sex (annual by province)
		General social survey (GSS), average time spent with various social contacts for the population aged 15 years and over, by population cohorts, occasional (average hours per day)
BC Stats Social/Economic data by Local Health Area	http://www.bcstats.gov.bc.ca/data/sep/rd/rd_main.asp	Age structure (annual by LHA)

		Population growth (annual by LHA)
		Ethnic identity (five years by LHA)
		Income (five years by LHA)
		Income dependency (five years by LHA)
		Housing costs (five years by LHA)
		Income assistance (annual by LHA)
		Alcohol consumption and per capita dollars spent on alcohol (annual)
		High school graduation rates (ave. 2 years)
		Test scores (ave. 2 years)
		Crime rates (serious, drug-related, spousal) (ave. 2 years)
BC Check up (Institute of Chartered Accountants of BC) by Development Region	http://www.bccheckup.com/	Disposable income per capita (annual)
		Total debt as a ratio to personal disposable income (annual)
		Percentage of household expenditure spent on basic shelter (annual)
		Percentage of the labour force aged 19 to 24 lacking a high school diploma (ave. 2 years).
		Percentage of the population using social assistance (ave. 2 years)
		Number of property and personal crimes per 10,000 population (ave 2 years).
		Percentage of the labour force between ages 25–64 possessing post-secondary (annual)

		Unemployed persons as a percentage of the labour force (annual)
		Real average hourly wage (annual)
		Female/male wage ratio for full-time workers in the labour force (annual).
BC Progress Board by census metropolitan areas and developmental region and health authority	http://www.bcprogressboard.com/2005Report/Annual/VII_Final_2005.pdf	real personal disposable income per capita (annual)
		Personal and property crime rate (annual)
		Percent of the population on income assistance (annual)
		Percent of total unemployment designated as long-term (annual)
Fraser Basin Council data for geographical area drained by the Fraser River and its 13 main watersheds. Annual State of the Fraser Basin Report: Sustainability	http://www.fraserbasin.bc.ca	Newspaper circulation rates (annual)
		Access to parks (annual)
		Park use (annual)
		Low income families
		Crime rates
		Percent of residents who are members in volunteer organizations

		Charitable giving
		Interim agreements with First Nations
		Voter turn-out rates
		Extent elected officials reflect age, gender and ethnic make-up of population