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Sustainability for Whom? Social Indicators for Forest-dependant Communities in Canada

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Sustainability for Whom?: Social Indicators for Forest-dependent Communities in Canada

by

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ABSTRACT

Increasingly, humans are recognized as integral components of forest systems. Certainly, humans are one of the dominant sources of disturbance in forested ecosystems. This research examines the sustainability of human forest communities. A great deal of human interaction with forests has the end purpose of deriving a livelihood. This is true of human communities that rely on subsistence use of the forest, human communities that use their forests to create fiber-based products, and human communities that rely on expenditures by visitors to their local forests. This research examines all three of these community types, as well as communities that rely on a diversified mix of these activities for their economic base.

A combination of methodological tools is used in this study to elucidate what sustainability means in nine case study communities. We report quantitative data on a standard suite of community well-being indicators, but we also report qualitative data from over 450 face-to-face interviews with residents of our case study sites. This combined methodological approach represents a significant advance over static, quantitative models or strictly narrative approaches. We structure our narrative data collection around sustainability indicators that the research team chose. We recognize that it is also important to obtain local residents subjective perceptions of social and economic trends. Our face-to-face interviews are sufficiently open-ended that important local themes unrelated to our chosen indicators also emerged.

Community sustainability is a flexible concept and one that involves a significant degree of subjective interpretation. We therefore chose not to place our nine case study communities in discrete, dichotomous categories of “sustainable” and “not sustainable.” Rather, we report on structural conditions that enhance sustainability (high human capital, rich natural resource endowments, etc.) and we also report on factors that create challenges to community sustainability (high poverty rates, high unemployment, high population turnover, etc.). For each case study we describe three such community sustainability “assets” and three “liabilities”.

ACKNOWLEDGEMENTS

A number of individuals were instrumental in conducting this research and ultimately contributing to this report. Leslie Just and Tracy Burkosky compiled and organized data and conducted literature searches from the office. John Parkins, Dianne Korber, Eloise Murray, Sara Teitelbaum, Solange Nadeau, Nicole Witwicki, Michael den Otter, Brian Hirsch and Audrey Sprenger conducted the necessary field work to enable us to write up the community case studies. Sara Teitelbaum also served as project coordinator for the latter stages of the work and facilitated the creation of the final products. This work could not have been done without the cooperation of community respondents who gave generously of their time and many of whom became the friends, hosts and confidants of our field staff. Fiona Salkie from the NCE-SFM provided support, assistance and advice. As well, additional, crucial financial and institutional support was provided by the Canadian Forest Service, the Foothills Model Forest, and the Canadian Circumpolar Institute.

INTRODUCTION

In 1987, the World Commission on Environment and Development (WCED) published Our Common Future. In that document, the Commission articulated a broad definition of sustainable development that has been widely adopted in policy documents and international agreements around the globe. While the speed at which governments (from local to national) have adopted the principles of the concept of sustainable development has been impressive, most scholars agree that progress toward achieving sustainability objectives "on the ground" has been less dramatic. The academic work that has followed in the decade or so since the publication of Our Common Future consists of a large number of attempts to further refine the definition of sustainability, and a smaller number of efforts to lay out frameworks for measuring and monitoring sustainability.

Sustainability means different things in different cultural contexts. It varies depending upon whether one is speaking of human systems or ecological systems. Much of the focus on sustainable development has been on environmental definitions. Others have focused on sustaining economic systems. This work takes social systems, communities specifically, as the unit of analysis and the object of interest. The research examines critical factors that contribute to or detract from the sustainability of communities. Sustainability of communities is integrally related to their adaptability (Beckley 1995). There are several examples of unsustainable communities across Canada - places such as Forest City, New Brunswick, once a thriving community of 3000 residents on the U.S./Canada border. This town's economy was based on fur tanning (using hemlock bark as a tanning agent) and it was unable to adapt or diversify its economic base when changes in technology, fashion and resource supply presented challenges to the continuation of its traditional economic means of subsistence. There are scores of similar places throughout the nation, Uranium City, Saskatchewan, Ocean City, British Columbia, Mountain Park, Alberta – resource communities whose resources played out, or whose developers pulled out, or communities that otherwise ceased to be communities and merely became place names on a map. One of the explicit goals of this project has been to document some of the less tangible and quantifiable elements or characteristics of communities that have allowed them to adapt and evolve as the larger social, political and economic contexts surrounding them have also changed.

Communities have been an analytical unit of special interest to sociologists since the inception of their discipline in the 19th century. It is important, however, to recognize population sub-groups within communities. These include sub-groups based on race or ethnicity, gender, age cohort, religious affiliation and the like. Secondary data is often collected and aggregated in such a way that it is difficult determine the status of sub-groups within a given community. To deal with this problem, we have employed multiple methods in this research initiative. Quantitative data is combined with qualitative data to provide a more balanced and detailed view of a given community. We identified a few specific community sub-groups of interest that we will feature prominently in this study. Nine forest communities were examined in total. Details

of those communities and the methods employed to understand them are provided in the analysis section.

Origins of the research

In 1994 the principle investigator for this project was invited to participate in a national process to develop indicators for sustainable management and use of forests. The Canadian Council of Forest Ministers sponsored the process. This national body is comprised of representatives of each of the provincial agencies that have management responsibility for Crown forestland. This body came up with 83 indicators in total, the majority of which have to do with ecological processes and trends. Thirty-three of the indicators relate to socio-economic dimensions of sustainable forestry. One element of the program pertains to Sustainability of Forest Communities. Among the indicators selected in this element are: 1) number of communities with a significant forestry component in the economic base, 2) index of diversity of the local industrial base, 3) diversity of forest use at the community level, and 4) number of communities with stewardship or co-management responsibilities.

While the issues or themes identified in these indicators are important and are echoed in the existing literature on forest sustainability, some of the assumptions behind these indicators are not entirely clear. As well, interactions between social and economic dimensions of sustainability are not explicitly compared to ecological facets of sustainability. In some cases these indicators may be contradictory. For example, high diversity of forest use at the community level may mean that all manner of non-timber forest products are identified and actively exploited by the local population. While this may diversify the economy and be seen as a stabilizing and positive factor for communities, the harvest rates of those products and their regenerative capacity may have implications for sustainability indicators related to biodiversity. Furthermore, the group charged with selecting the indicators were not explicit in the desired direction of trend. For example, the Canadian Forest Service technical report on Criteria and Indicators does not identify whether an increase or a decrease in the number of forest-dependent communities enhances forest sustainability (Canadian Council of Forest Ministers 1997).

Some of the flaws in the indicator selection process were due to the fact that the process was initiated and managed by members of the forest policy community that had only a rudimentary understanding of social and economic aspects of sustainability. There was no attempt to do bachground research to determine what sorts of indicator frameworks already existed for examining sustainability of communities. Social indicators are statistics, collected over time that can be used to improve decision making in policy and management (Force and Machlis 1997). Most often, social indicators measure progress toward certain ends or assessment of trends toward or away from certain desired end-states. Part of the problem with CCFM indicators involves confusion between ends and means. By and large, persons in the traditional forest policy community have been interested in the sustainability of forests as the desired end, and they are interested in human communities only insofar as these may provide means toward achieving that end. Social scientists, on the other hand, are interested in the sustainability of

social units such as communities or institutions such as the market economy, and they are interested in how forests and human uses of forests may be means toward this alternative end. This and related research efforts were largely motivated by an attempt to shed light on the substantial history of community indicators research that has been done in the past, and to present some of this information to the forest policy community in Canada.

Beckley and Burkosky (1999) review 22 initiatives that take an indicator approach to social sustainability. A large number of these are forest community studies. Others are non-forest community studies, and still others are provincial, national and international attempts to define indicators that measure progress toward sustainability for communities or other socio-political units of analysis. From this research, a number of "consensus pick" indicators emerged. A selection of these indicators form the foundation of the current study.

Objectives of the research

The "Sustainability for Whom" research program has four main objectives.

1) To determine a standard suite of indicators and measure and compare these across case study communities.

   The reasons for taking an indicator approach are suggested above. In order to measure progress toward sustainability objectives, we need to establish baseline data for values that matter. We also need to determine the directions of trends that enhance sustainability. For the purposes of this report, we do this in a two-staged process, whereby we examine social and economic indicators from secondary sources first, and then obtain local subjective assessments of the indicators as well.

1) To expand the definition and discussion around what constitutes a forest-dependent community.

   Objective number two is to widen the dialogue with regard to what constitutes a "forest-dependent community." The forest policy community and researchers in forest social science have traditionally equated forest dependence with timber dependence. Beckley (1998) has articulated that humans depend upon forests in a multitude of ways. By extension, there are a number of types of forest-dependent communities. Among these are subsistence-dependent forest communities, tourism-dependent forest communities, and traditional timber-dependent forest communities. In past research, sociologists and economists have limited the scope of their work to timber-dependent communities. This is partly due to data limitations. Statistics Canada does not collect data on subsistence use of forests. Data on the tourism or visitors sector is collected in such a way that it is impossible to segregate employment attributable to business versus recreational travel, as well as local versus visitor expenditures for some services (such as restaurant meals, for example). As a result, it is impossible to create an index of tourism dependence using the same methodology traditionally employed for determining timber dependence.

1) To examine distributional issues in forest-dependent communities to determine how well-being differs among cultural, racial, generational and gendered sub-populations.

In early resource-dependent communities studies, the white males that constituted the labour force were the main group studied (Knight 1975). As resource-dependent communities became more settled and family oriented, more diversity among the community became manifest. In the late 20th century a wide range of diverse forest communities exist with substantial differences between life opportunities for demographic sub-groups within communities. This work attempts to move beyond aggregate data to demonstrate the actual life chances available to and realized by the full spectrum of forest community residents.

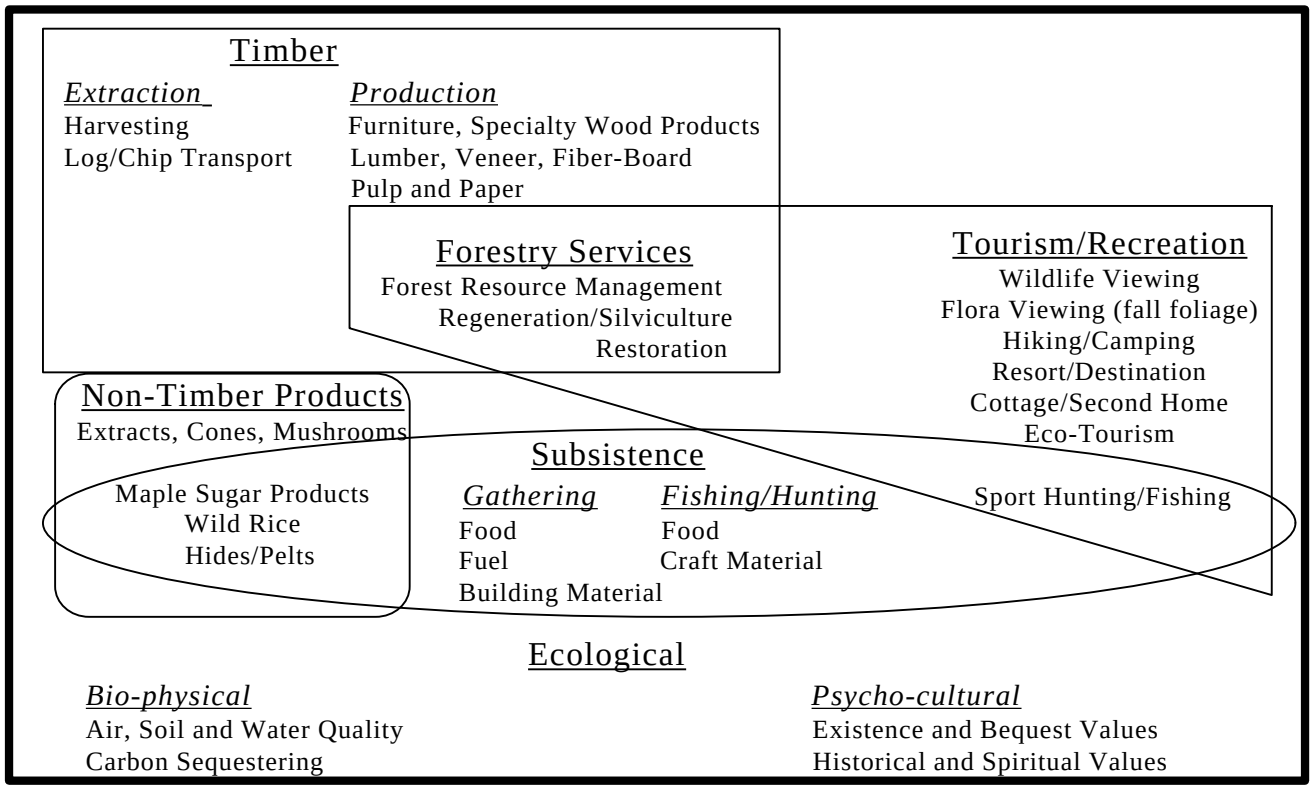


Figure 1: A typology of human uses of forests (reprinted from Beckley 1998).

1) To illustrate the utility of multiple methods and multiple data sets for understanding sustainability in forest communities.

Objective data at the community level does a poor job of enhancing our understanding of well-being for population sub-groups. For this reason, and also to triangulate our data, we combine quantitative and qualitative data sources related to our indicators. As well, we allowed room in our face-to-face interviews for other themes and issues important to the respondents to emerge.

Methods

This study employs two main sources of data for the analysis; secondary data from Statistics Canada census, and primary data from field work in the nine case study communities. Statistics Canada reports data in geographically based units every five years. The most commonly used unit is the Census Subdivision (CSD). In rural areas, CSDs are usually either incorporated places, such as towns, villages, or hamlets, or other officially designated geographical units, such as First Nations Reserves. Other rural land, open country as it is sometimes described, are also included in CSDs, but these are often much larger and are less likely to conform to traditional community boundaries. For the most part, CSDs may serve as proxies for communities. In some instances, this becomes problematic, such as in Queens in the present study. The local administrative unit is now the regional municipality, which encompasses many small, historically independent communities. While it would perhaps be more appropriate to focus on a few of the small hamlets within the two Queens CSDs, the way the data are reported do not allow us to do this.

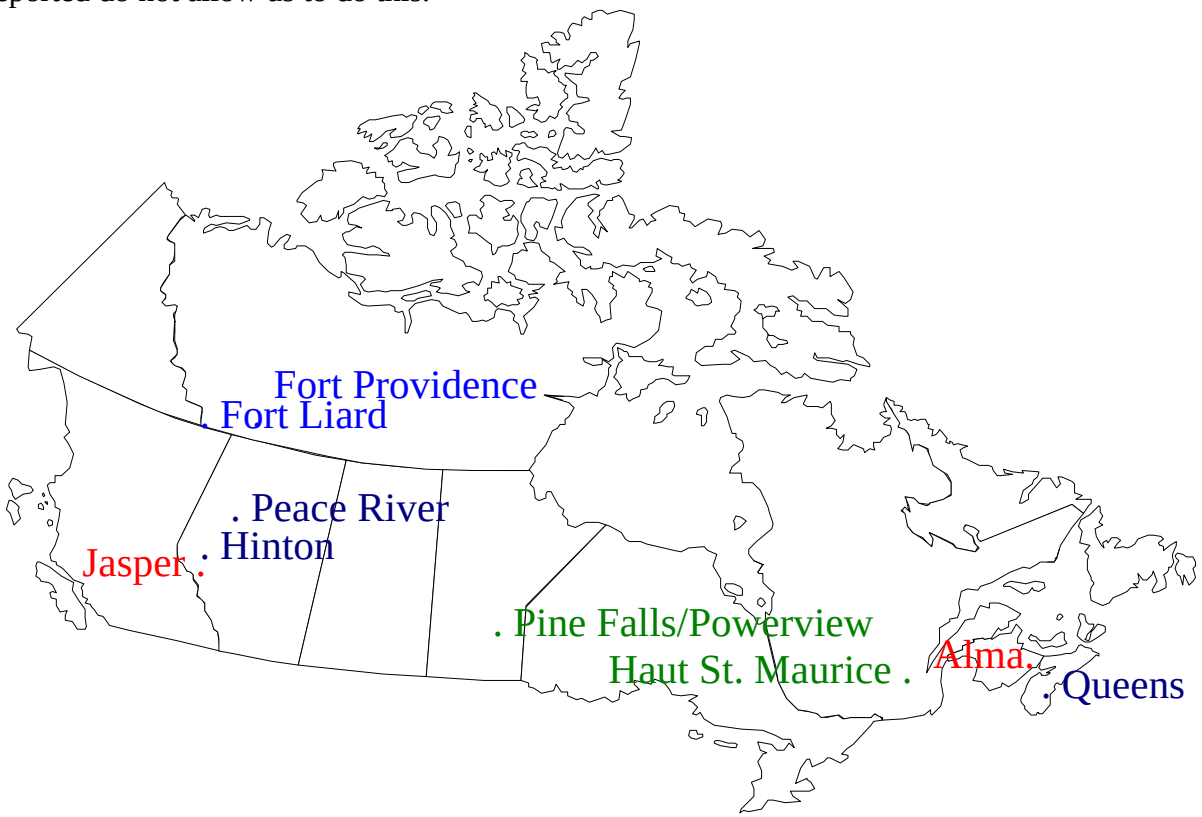


Figure 2: Case study sites for “Sustainability for Whom” project.

Statistics Canada reports data on employment, population mobility, education attainment, native language, household composition, labour force participation, real estate values, age, incidence of low income, average income, and other variables. Because these data are reported with a consistent methodology, in relatively consistent geographical units, and they are reliable,

inexpensive, understandable to a lay audience, and are sensitive to change, they are quite useful as indicators. The sensitivity to change and regular reporting of these data make them particularly useful for establishing baselines and reporting trends.

Primary data was also collected by the nine field site teams. In most instances (Pine Falls/Powerview, Haut St. Maurice, Alma, Queens, and Fort Providence) one individual was responsible for the field work. In the remainder of cases (Fort Liard, Peace River, Jasper, and Hinton) a team approach was employed. On average, field teams were in residence for 3 person-months per site. During this time they were charged with conducting between 30 and 50 face-to-face interviews with a broad cross section of the community. Interview respondents were selected through a snow-ball sampling method, with close attention paid to representing gender, age, racial and ethnic diversity. As well, we spoke with people in a wide cross section of class and occupational categories, including local business persons, social service workers, mill workers, trappers, homemakers, wage labourers, professionals, members of community groups, clergy, unemployed persons and others. Some community case studies were co-funded by other projects and in those places we completed more interviews than in other communities. In the end we conducted over 450 interviews with local residents in the nine case study communities. There was no standard format to the interviews. Rather, field team members were instructed to cover a range of themes, including the nature of local forest dependence, subjective assessments of our selected indicators, and questions about local perceptions of problems and issues in their community.

In addition to face-to-face interviews, field teams collected locally generated secondary data, historical data, maps, and a few conducted more formal, quantitative surveys on themes that seemed particularly relevant (youth issues in Queens, and attitudes toward forest management in Haut St. Maurice). As well, field teams engaged in participant observation and non-participant observation during their time as temporary residents of these communities. Informal interactions in stores, meetings, Legion Halls and bars, parks, community events and other daily interactions provided considerable insight into the character of the communities. Ethnographic methods of this sort provide considerable context and understanding regarding how communities function, what social divisions exist, what power structures are in evidence, and the like.

SUMMARY OF DATA ANALYSIS

How to look at the data

As previously described, Statistics Canada does not collect data that allow us to create indices of subsistence-dependence or tourism-dependence the same way we can create an index of timber-dependence. This significant data limitation is partly why we use a case study approach for this research project. The data presented below, then, should be viewed as descriptive of the cases we examined. We are in no way attempting to generalize about a given community type with a sample size of two or three cases per cell. However, we are looking for patterns and differences between community types. Such differences will be noted in the text accompanying the tables in the data review to follow. Ideally, our analysis would include a statistical comparison of indicators between the 337 heavily timber-dependent communities in Canada and similar numbers of tourism, subsistence and diversified communities. Unfortunately, limitations of the census data do not allow for this sort of analysis at this time.

Population/Migration

One of the most obvious indicators of community sustainability is population change. Both rapid growth and decline can lead to challenges to community well-being. Scholars who wrote about community stability prior to the more recent literature on community sustainability also used population change as an indicator. In the early 20th century concerns were raised over the rapid rise and decline of timber communities (Dana 1918, Kaufman and Kaufman 1946). The concerns were based on social pathologies observed over the previous century as a pattern of boom and bust played out in region after region in the United States. Canada, with its lower population density and significantly larger forest resource, did not suffer as much from resource depletion. Nevertheless, the rapid harvest of timber and the social pathologies associated with local over-harvest was not lost on Sir John A. MacDonald. “The sight of the immense masses of timber passing my windows every morning constantly suggests to my mind the absolute necessity there is for looking into the future of this great trade. We are recklessly destroying the timber of Canada and there is scarcely a possibility of replacing it,” Sir John A. MacDonald 1871 (Natural Resources Canada 1999). Ottawa was itself once a timber-dependent community and while it was fortunate enough to reinvent itself as a government service center, other more isolated communities were not as fortunate.

While rapid local population decline due to cut-and-run policies was almost universally agreed to be a negative social phenomenon, later research on the social impacts of development suggested that rapid increases in population may also negatively effect community well-being (Freudenburg 1986, Burdge 1994). A population that is stable in numbers but that experiences rapid turnover (high rates of in-migration and out-migration) may also exhibit higher rates of social pathologies such as crime, divorce, substance abuse, and spousal abuse.

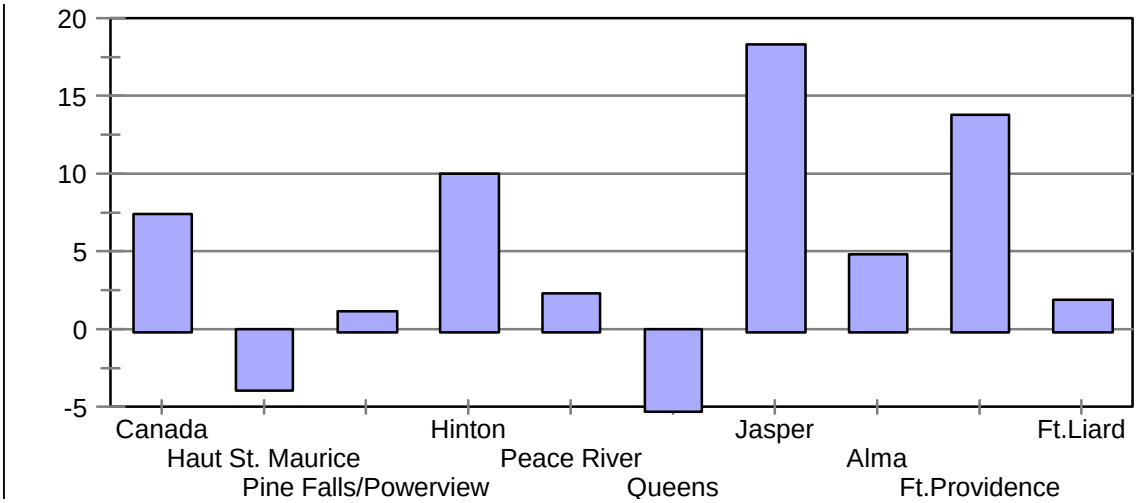


Figure 3. Percent change in population from 1991 to 1996.

In our sample of case study communities, there were no strong trends in population change associated with community type for the period from 1991 to 1996 (Figure 3). Both the subsistence communities grew over that five year period, though at substantially different rates. The same is true for the tourism-dependent communities. One of the diversified communities lost population while the other two grew. Also, one of the timber-dependent communities grew while the other lost population.

Over the longer term, the communities that have experienced the greatest growth have been those in the western and northern part of the country. The population change for our case study communities appear to have a stronger relation to the region in which they are located than to community type. The eastern and centrally located communities of Alma, Queens, Haut St, Maurice, and Pine Falls have experienced marginal increases or declines over the thirty five year period between 1961 and 1996. The western communities, on the other hand have grown rapidly, with Jasper and Peace River doubling and Hinton trebling in size, respectively (Figure 4).

As previously noted, many scholars suggest that population turnover is nearly as important as growth or decline in absolute numbers in enhancing or detracting from community sustainability. Rapid turnover in a local population prevents bonds from developing that foster social cohesion and ultimately community capacity. Most community developers agree that it is better to attract and keep families or individuals for the long haul rather than having people cycle through. The trend in many resource communities has been to attract persons for short periods of time. Once again, no strong trends emerged on this variable that seem to relate to community type. The Alberta case study communities were among the highest for the percent of their populations who lived in a different census subdivision in the previous census period (Figure 5). Surprisingly, Alma, New Brunswick also had a high mobility rate. These data were not corroborated by our qualitative work and may be due to a combination of seasonal employees

declaring Alma as their place of residence in combination with the small population there and rounding error.

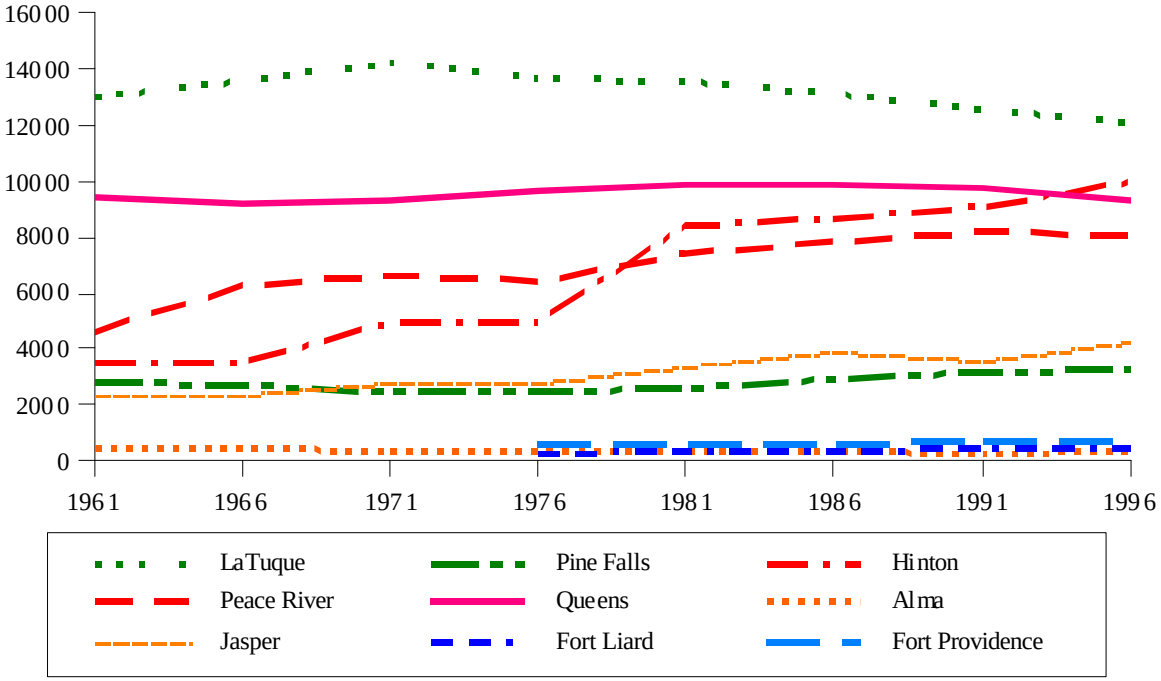


Figure 4. Population change from 1961 to 1996

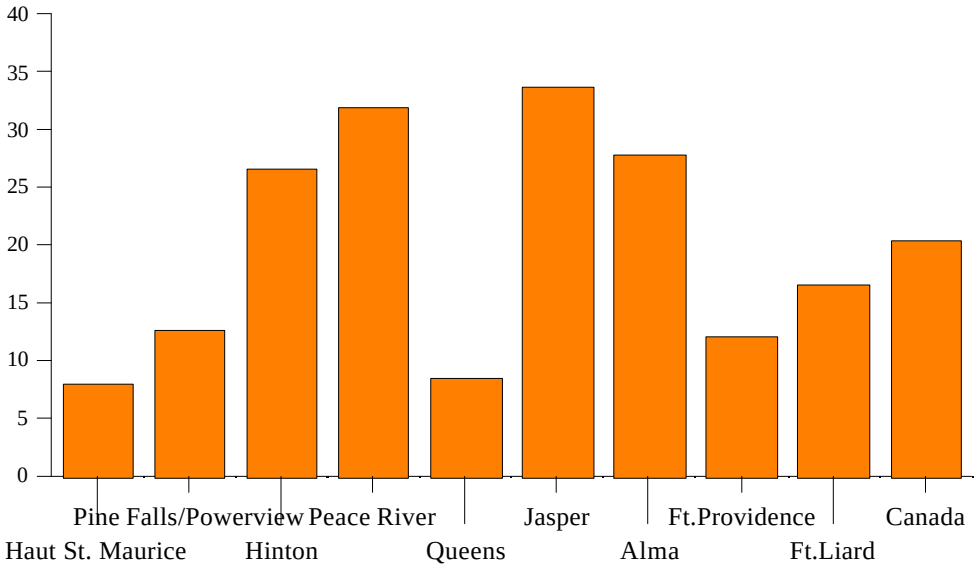


Figure 5. Percent of residents migrating within the 5 year period prior to 1996

Employment

Unemployment has long been used as a measure of community well-being and as a performance indicator for local, regional, provincial and national economies. We measure employment and also examine labour force participation, gendered divisions of labour within local labour markets, and the percent of persons with full and part-time employment. In our case study communities, unemployment tends to be lower in the diversified communities, and once again this is particularly true in the west (Hinton and Peace River). Queens had average unemployment in 1996, slightly higher than the national average, but not bad for rural Canada. There is a great disparity in unemployment rates between the two tourism communities, Jasper and Alma. Some of this may be explained by a "need to reside" clause established by Parks Canada for Jasper townsite.

In order to reside in Jasper, a resident needs to work there or have worked there for a significant period of years. Without a doubt Jasper has a more vibrant tourism oriented economy than Alma. Jasper also does a better job of maintaining employment in the shoulder seasons (spring and fall) and in the winter skiing due to a downhill ski facility nearby.

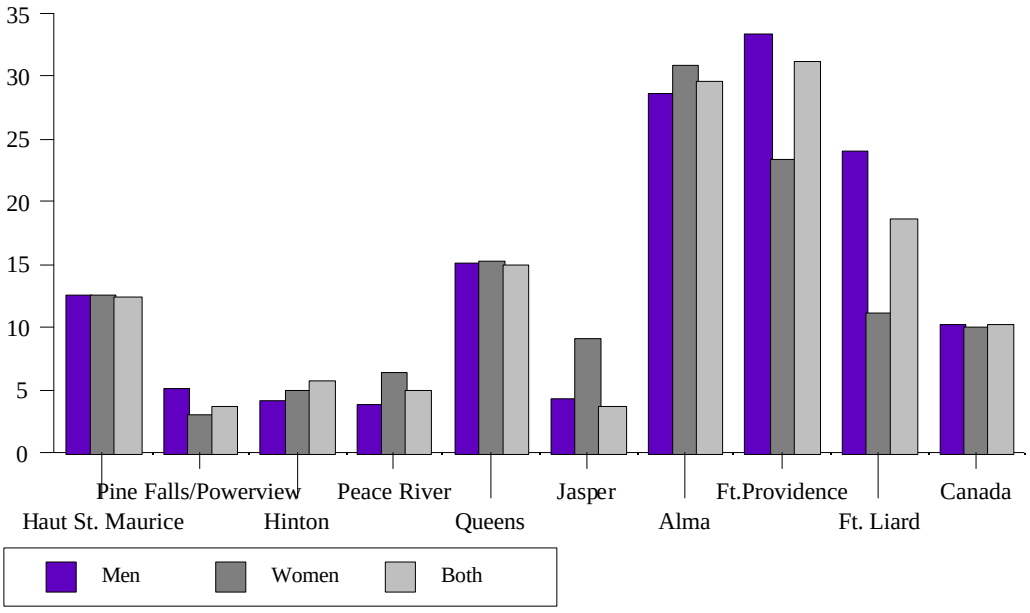


Figure 6. Unemployment rate, 1996

Fort Liard and Fort Providence both had extremely high unemployment rates in 1996. The situation has changed dramatically for Fort Liard due to an explosion of oil and gas activity (both exploration and pipeline construction). When we revisited Fort Liard in January of 2000, many residents said that there was work for whomever wanted it. There were some comments that the quality of jobs available to local residents is not always high, and also concerns that the decrease in unemployment was likely temporary. For the time being, however, the employment situation there had drastically improved. Ironically, that same fact altered the degree to which

Fort Liard can be said to rely heavily on subsistence use of forests. While subsistence activities were clearly important through the 1990s (Beckley and Hirsch 1997), subsistence activities currently appear to have more cultural than economic significance. It should be noted that traditionally, subsistence activities have served as a local social safety net. Those without steady work turn to the bush. Many are skeptical whether the current boom in Fort Liard will continue, so it is not out of the realm of possibility that subsistence activities could dramatically increase once the natural gas exploration and pipeline construction slows a bit.

Pine Falls/Powerview and Haut St. Maurice, the timber-dependent communities had significantly different unemployment rates, but neither showed significant deviations from the national average in 1996. The mill in Pine Falls was purchased by local employees and managers in 1994, and in 1996 significantly employment occurred in building new facilities and infrastructure for the mill. The mill in Haut St. Maurice, on the other hand, also went through some hard times but with somewhat less success. Employment declined follow a sale of the mill in the early 1990s and some left (see Figure 3) and many of those who stayed behind were out of work.

The distribution among occupational types in our nine case study communities is fairly typical of rural communities in Canada. Interestingly, nearly all the communities show significant reliance on forestry, other natural resource sectors, and manufacturing. Most of the manufacturing employment in our case study communities is related to the processing of forest products. The diversified and timber-dependent communities have the highest total participation in manufacturing, processing and primary sector industries. Jasper's location within a national park, combined with the "need to reside" clause, precludes much manufacturing or primary sector employment in that community. Interestingly, however, the subsistence communities showed high employment in industrial natural resource sectors as well.

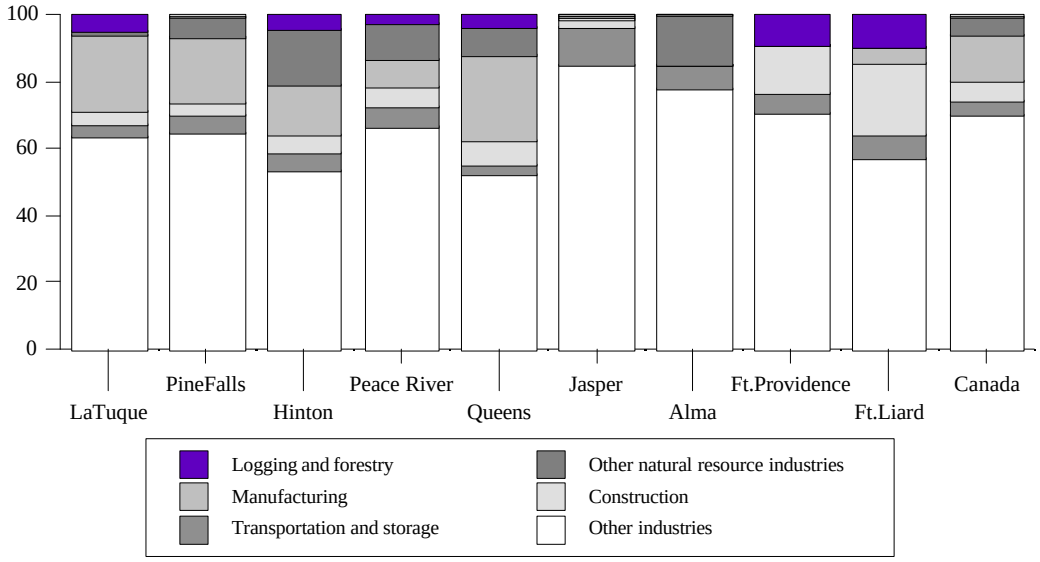


Figure 7. Participation in selected industries, 1996.

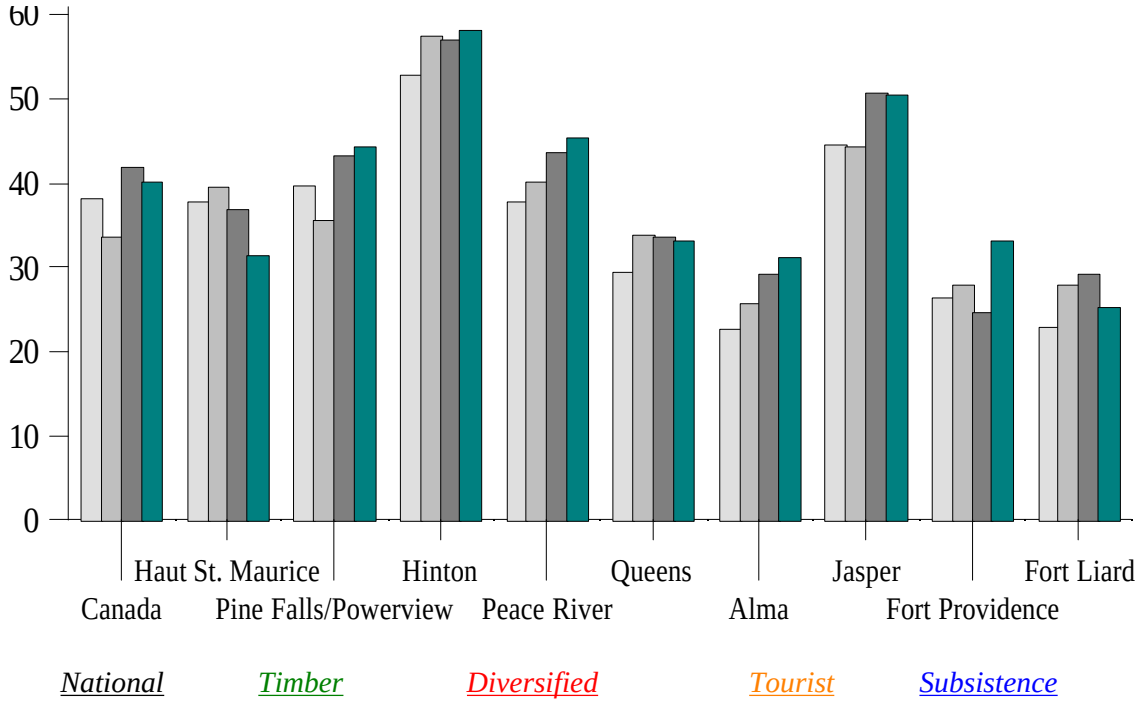
Income

Median income varied quite dramatically across the nine case study communities. The median household income in our wealthiest community, Hinton ($58,000), was more than twice that of our least wealthy community, Fort Liard ($25,000). The national median household income in Canada in 1996 was just over $40,000 and four of the five cases exceeded this number. As with many of our indicators, there was significant variation within our categories. The two subsistence communities had consistently lower median incomes than our other case study communities for the 15 year period between 1981 and 1996. The median incomes of the two timber-dependent communities were also very close, but the trends for Pine Falls/Powerview and Haut St. Maurice are in opposite directions. Considerable variation was apparent in the diversified and tourism-dependent communities and within these five communities there continues to be a regional association with stronger performance in the western communities and weaker performance on the income variables in Atlantic Canada. The median incomes that are reported in Figure 8 are all in constant (1996) dollars and all but two communities show stable or increasing incomes.

Another important factor with income in our case study communities has to do with income distribution, and particularly income distribution across gender. Gender is the only population sub-category that Statistic Canada provides in community profile data, however, the results are quite telling. In Hinton, for example, the overall average income is higher than all our other communities, but there is a bi-modal distribution of income. That is, a large cluster of individuals at the high end of the income scale, and a large cluster of individuals at the low end of the income scale. Moreover, the differential income apparent in Hinton overall, is largely a function of differential earnings between men and women. Women are more prevalent in the part-time labour force and in the service sector, while men are more likely to be employed in

full-time work in the higher-waged resource sectors. The result is an income distribution that is highly skewed along gender lines.

Fort Liard, on the other hand, is universally worse off in terms of income. Very few men or women earn more than $40,000. As a result, the community has more gender equity in income, but less wealth overall. It is difficult to make a judgment as to whether one or the other scenario is more "sustainable". Rather our approach is to highlight the characteristics of each community, and discuss the challenges that each scenario presents. In Hinton, the gender-wage gap is somewhat mitigated by the high proportion of residents in two-parent households. Because of that, some income from higher-wage earning men is likely reaching and benefitting lower wage-earning women, or allowing women the choice as to whether they wish to enter the labour force or not. In Fort Liard, one might interpret these results in several ways. Some might like to see incomes in that community raised closer to national averages. However, low incomes may be partly explained by people spending time in non-wage, subsistence activities. If this is the case, and if practicing subsistence livelihoods is highly valued in the community (which our narrative data suggest), then income and income distribution are likely poor sustainability indicators for our subsistence communities.



*Income adjusted to 1996 real dollars.

Figure 8: Median income in 1996

Poverty

Poverty data were not available for our subsistence communities. Were they available, you would undoubtedly see higher poverty rates for the subsistence communities relative to our other case study communities. Beckley and Hirsch (1997) point out, however, that nearly one third of total household income is attributable to the subsistence economy in Fort Liard. This reliance on the bush is not accounted for in Statistics Canada calculations though it does clearly contribute to a reduction in absolute poverty levels for those involved in the bush economy. For the remainder of our case study communities, poverty is consistently lower than the national average. This is so for a couple of reasons. First, the low-income cut-off varies by locale. Costs of living are assumed to be higher in major urban centers and therefore people with higher absolute incomes still qualify as low-income in most census metropolitan areas. Secondly, the institutional infrastructure and service delivery systems that serve the poor tend to be located in major metropolitan areas. This creates a pull factor. Cities are perceived to hold better prospects for employment and better services for the unemployable, so people in low income categories tend to gravitate toward cities.

The most dramatic change in poverty rates is demonstrated in Alma, though some of the secondary census data for Alma appear suspect because of the small population size and rounding error. Data for that community are more susceptible to alteration due to rounding. Narrative data on poverty in Alma suggest that the years 1986 and 1991 are more representative than the data for 1996. The tourism based economy is very seasonal, and when unemployment cheques get scare in the spring, many in the community face hard times.

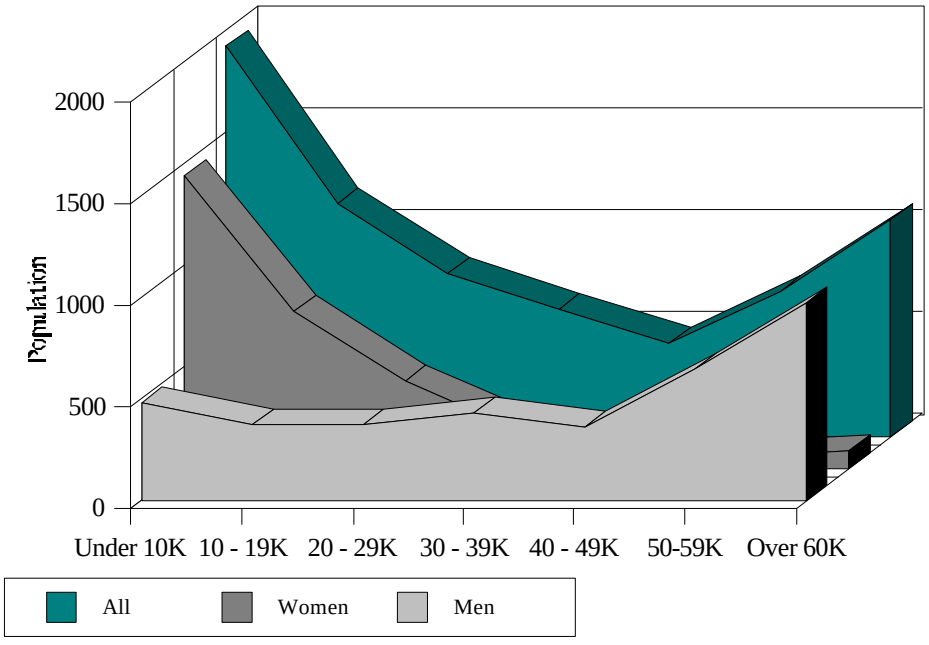


Figure 9: Income distribution, Hinton, 1996

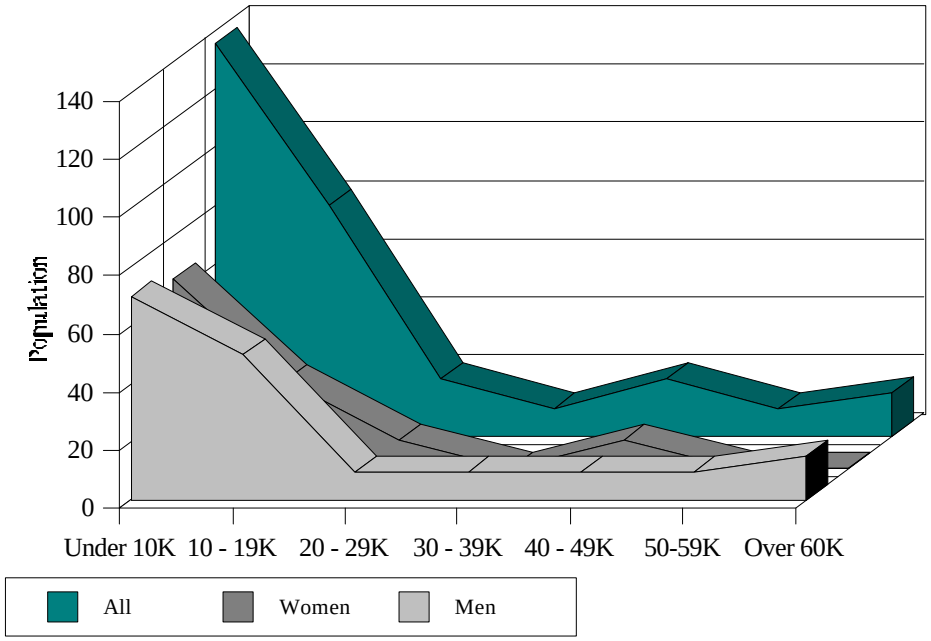


Figure10: Income distribution, Fort Liard, 1996

Several other communities have shown substantial improvements in poverty rates over the past 10 years. Peace River and Pine Falls/Powerview have seen significant improvements. Jasper has seen the greatest increase in poverty over the ten-year period. Our narrative data suggest that many young people chose Jasper as a place to live and work due to the lifestyle that the place affords. Poverty rates for unattached individuals are quite high in Jasper. The data in Figure 11 relate to family poverty and it is clear that family poverty is on the rise as well. Jasper is increasingly becoming an expensive place to live and the high cost of housing will continue to keep a large segment of the population at or near the poverty line.

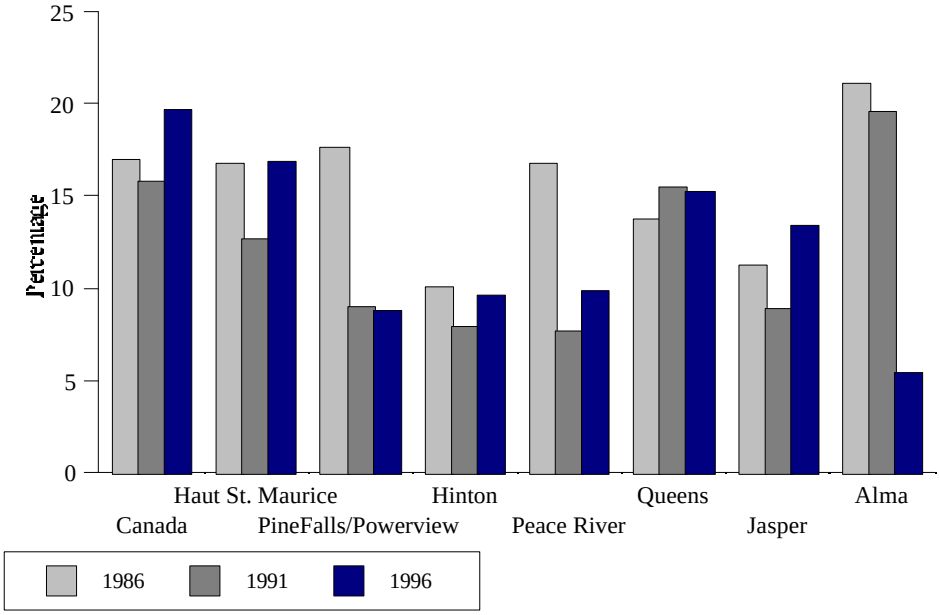


Figure 11: Low income levels for families, 1986-1996.

Human Capital

Human capital refers to the aggregate skills, education, training, and experience of a person, a family, or a community. Most commonly, human capital is discussed at the level of the individual. In this study, we are interested in the collective human capital of our case study communities. Unfortunately, human capital is one of those variables that is measured quite imperfectly by Statistics Canada. That agency does report education attainment, that is, the percent of the population in a given locale that has completed a certain level of formal training. What this misses, of course, is informal, on-the-job training that is common in industrial settings. It misses bush skills that may be critical to survival in a subsistence economy. And it misses entrepreneurial skills, which may be important to succeed in small businesses that characterize the tourism industry. As well, education attainment alone may miss other skills (such as quality of local leadership) that contribute to a community's ability to adapt to changing economic conditions.

As with some of the other indicators, the trends for education attainment in our case study sample did not reveal a great deal of consistency within categories of community types. This was particularly true in the diversified and tourism-dependent communities. There was more internal consistency with the timber-dependent and subsistence-dependent communities. The most striking data with both of these latter categories is the large number of individuals with less than grade 9 education. Once again, our narrative data help to explain why these communities have two to three times higher populations in the lowest education attainment category relative to the national average. In the timber-dependent towns, the high percentage of individuals with less than grade 9 education is a legacy of past hiring practices in the forestry sector. Individuals could earn high wages with minimal education, so many made the rational choice to forgo additional investment in their own human capital. Other scholars have commented on this phenomenon (Freudenburg 1993). More recently, mills have begun to require at least a grade 12 certificate or its equivalent for work in the mills. As a result, education levels in timber communities are improving and the high percent with less than grade 9 tend to be older individuals.

In the subsistence-dependent communities there is often a trade-off between acquiring bush skills and attendance at school. Due to the traditional hunting and trapping patterns, people are more likely to go "on the land" (to their bush camps) in the winter months. This is also when school is in session. So parents are faced with the difficult decision between passing on their culture and bush survival skills to their children, or giving them the opportunity to acquire formal educational training that might lead to employment in the market economy. If parents choose to take kids out of school to teach them bush skills, they will be better equipped to survive locally, where they know the land base and possess the skills to reap the local harvest. If parents choose to leave their kids in school and encourage them to acquire post-secondary education, they may have to leave home to find work, and they will likely be less well grounded in their culture. These are difficult choices for parents to make. Jasper has the highest proportion of individuals with some university training. In fact, Jasper has nearly twice the national average in that category. At the other end of the scale, Jasper has the fewest people in the lowest education

attainment category, by quite a margin. This lends some credence to the claims made by some that high-amenity environments will attract a highly educated and skilled labour force (Power 1996). While Alma has a very different education attainment profile, one could argue that the same phenomenon simply hasn't occurred there yet. On the other hand, while the environmental amenity value of Alma is high compared to many rural places (it sits on the Fundy Coast, adjacent to a small national park), most would agree that it is not in the same league as Jasper.

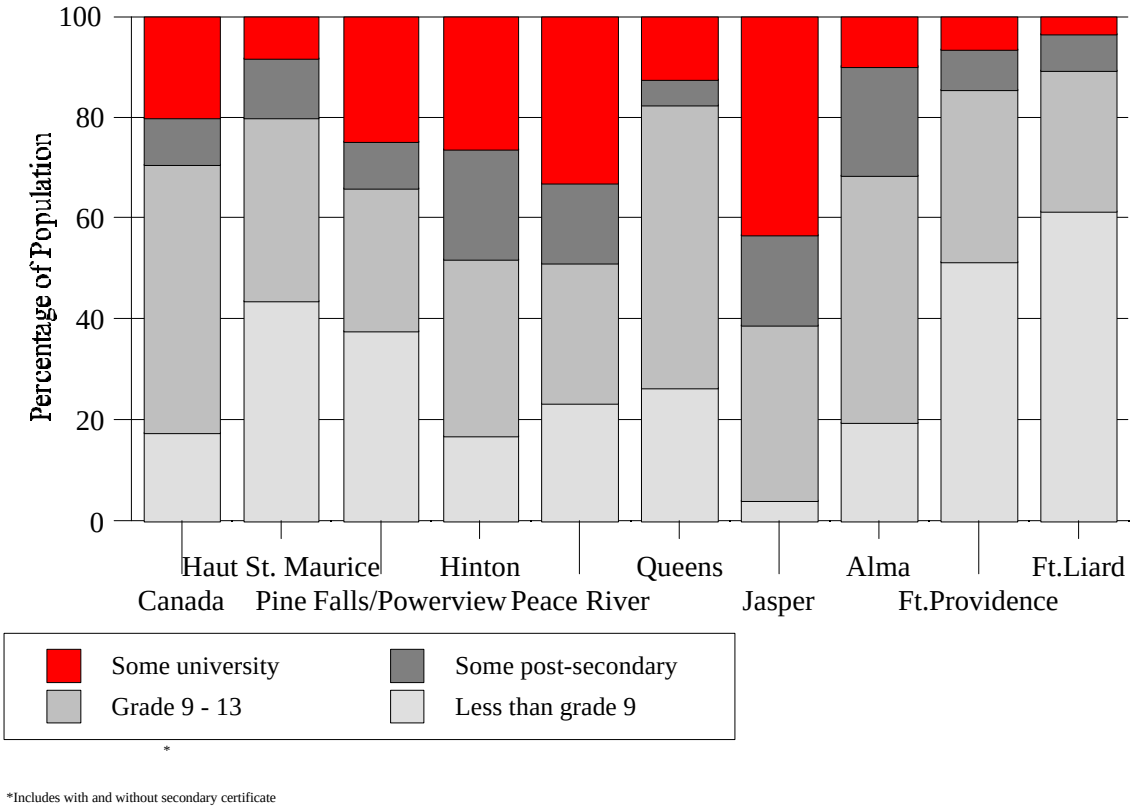


Figure 12: Education attainment as a percent of total population for those 15+ years of age, 1996

The diversity in education attainment in the diversified communities is partly explained by the historical bases of the local economies in these places. For example, Queens has traditionally been timber-dependent and is only recently diversifying into tourism and visitor services. This new sector does not have significantly different educational requirements for its labour force than the timber sector. Low-skilled, low wage employment is endemic to the tourism industry. Peace River on the other hand, has traditionally been a government service center. In the mid-1990s the provincial government withdrew many of those services and several offices were closed. When the 1996 census was conducted it is quite likely that many of the university educated government employees were still in residence there. It will be particularly interesting to see if the relatively high proportion of the population with some university has remained in Peace River when results from the 2001 census are available.

Real Estate

Real estate as an indicator of community sustainability is not a consensus pick among social and economic researchers (Beckley and Burkosky 1999). We decided to examine real estate values and housing costs for a number of reasons. First, we anecdotally hear about plummeting real estate values in timber or other resource communities that are facing the shut-down of a mill or processing facility. Fluctuating real estate prices would be a sign of community instability and might offer a challenge to sustainability for some places. Secondly, we believed that rising real estate values might be an important contributor to poverty and low income in tourism based communities. Most tourism community jobs are low wage and seasonal. As tourism communities become more popular and more desirable places to live, real estate prices (and associated property taxes) may be driven up, resulting in further financial strain for local retirees on fixed incomes or long-term residents who are struggling to make the transition to the new economy.

The data on real estate values show stability in most places. Most notably, real estate values remained fairly constant in both Haut St. Maurice and Pine Falls/Powerview. This was despite the fact that both underwent major restructuring in their mill ownership and infrastructure and uncertainty during this period. The Pine Falls/Powerview mill was sold to a local management/worker consortium after three years on the market. The mill in LaTuque was also at risk of closure and a partial worker buyout also saved the
day there. In both these cases, real estate values remained constant due to the fact that people did not lose confidence in their communities or in the processing facilities upon which they depend. Rather, what people related to us in the qualitative interviews was that during the periods of stress and uncertainty, real estate simply did not turn over. Few people put their homes on the market for fear of taking a loss.

Jasper, a tourism-dependent community, and Fort Liard, a subsistence-dependent community have both seen skyrocketing prices, both due to unique circumstances. Fort Liard was only connected to the rest of the world by road in 1983. Obviously that fact and the growth of the local economy has had an effect on real estate values. Jasper is unique in that the townsite is surrounded by national park and there are strict supply controls on available building lots, for both commercial and residential construction. This has inflated the value of those lots and the value of the existing stock of houses to well beyond what comparable real estate would be worth in other small, rural towns. Alberta experienced a major adjustment in real estate prices after 1981 due to energy prices and the recession of that period. While Hinton and Peace River real estate values have stabilized in the aftermath of that shock, Jasper's have recovered and moved well beyond 1981 values.

In the remaining communities in our sample, real estate prices have remained relatively constant. Alma is showing some sign of increasing values. Locally this is a topic of conversation. Alma may be a town poised on the edge of a real estate boom due to its high amenity values, the

demographic bubble of new retirees, and the lack of available land (Alma is hemmed in by the Park, the ocean and some very steep, unbuildable land).

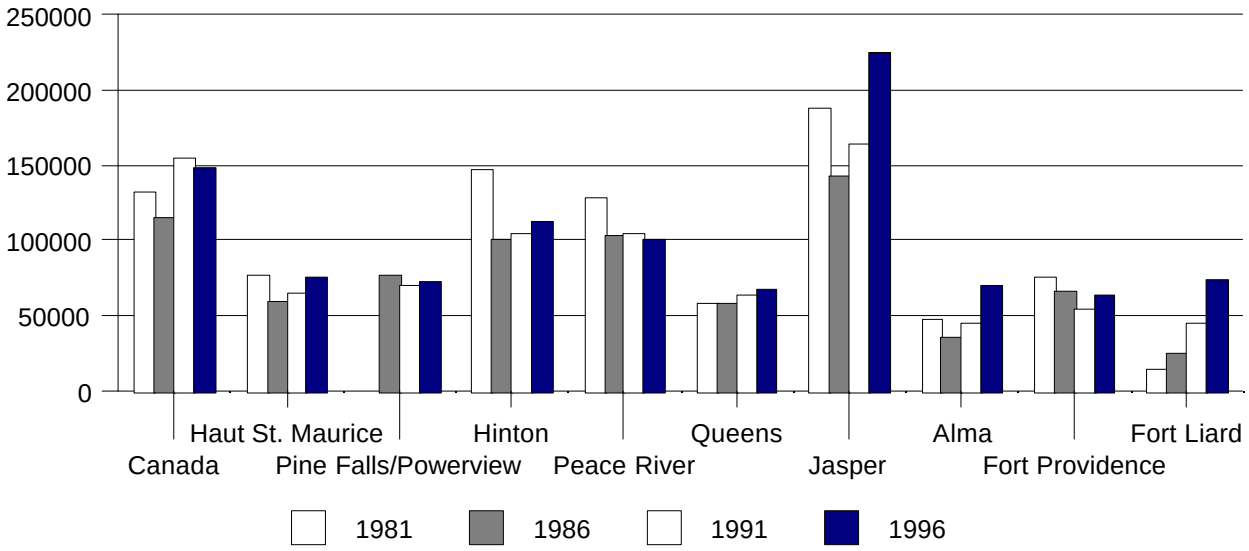


Figure 13: Average value of a dwelling, 1981-1996

MANAGEMENT APPLICATIONS

Given the broad scope of this work, and its distance from field-level forest management activities, the management applications of the research are somewhat general. This does not diminish their importance, however. Most of our forest development activities are undertaken in pursuit of enhanced quality of life for individuals, families, and communities. Traditionally, forestry and forest management have emphasized utilitarian values as a means to obtain a livelihood, or sometimes to achieve recreation oriented goals. Increasingly, Aboriginal values, spiritual values, biodiversity values and ecosystem function values are coming to the fore and are being recognized as valid, desirable objectives for forest management. The challenge of sustainable forest management is to balance the ecological functioning of natural systems with the increasingly diverse set of demands placed on those systems by human wants and needs.

The management applications that flow from this work, therefore, deal with policy level forest management issues and broader social, political, institutional and organizational issues rather than with field-level forest management prescriptions. The ultimate aim is to make recommendations that enhance the quality of life and promote sustainability of Canada's forest-dependent communities. The forest is limited in the benefits that it can provide. While some improvement in quality of life may flow from utilitarian uses of forests, other means must also be pursued to ensure the long-term health, well-being and sustainability of forest communities.

Assessing social sustainability

Sustainability is a tricky concept, particularly when applied to something as complex as human social and economic systems. The essence of the WCED Report is easy to grasp and it is perhaps best expressed in the following frequently quoted passage, "sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations" (WCED 1987) What is rather more difficult is operationalizing the concept of sustainable development for complex systems. For example, an increased rate of timber exploitation in any given forest management area would likely increase local incomes, at least in the short term. So income may be an appropriate indicator for the social system, but it may have an inverse correlation to indicators in the natural system to which it is connected. This provides a challenge in representing something as diverse and multi-faceted as a community as either being sustainable or not. Another complicating factor that has been alluded to previously is the fact that communities are comprised of diverse populations who may not benefit equally from our forest wealth.

For this reason, we have chosen not to "judge" our nine case study communities as being either sustainable or not sustainable. Our approach, rather, has been to use both the quantitative and qualitative data available to us to identify assets and liabilities for each of these communities. Assets refer to positive forces or capital stocks that contribute to community sustainability. They are the components upon which the community currently relies and can also build upon to create long-term prosperity and sustainability. Liabilities represent unique challenges facing each community. These may be related to human capital deficits, over-exploitation of resources, low institutional capacity to deal with problems (e.g. poor leadership), or other social, economic, or institutional problems that inhibit continued development and flourishing of any given community. In the main report, we identify three assets and three liabilities for each community. These are presented in Appendix A. Our assumption in doing this is that all communities have positive and negative qualities, and that by recognizing both and working from an understanding of what works and what doesn't work, institutional players can build more sustainable communities. After discussing some of the universal themes that seemed to cut across nearly all of our case study communities, we will address the management implications of this research for some of the key institutional players in our case study communities and more broadly for all types of forest-dependent communities in Canada.

Universal themes

A variety of themes emerged from our field work that seemed to hold relevance in every community. A number of these themes are closely related to one another, such as youth issues and economic opportunity, or economic opportunity and economic diversity. Not surprisingly, nearly every community in our sample was concerned with youth issues. The range of concerns was wide because the issues related to youth were diverse. For example, soaring youth unemployment rates, fears over losing their elementary school, and lack of opportunities for

youth in the labour force were concerns in Alma, one of the tourism-dependent communities. In the other tourism-dependent community, youth issues were similarly important, but quite different. Jasper experiences a huge annual influx of youth, especially in the summer. They come to work in the tourism services sector and to enjoy a Rocky Mountain Summer, which is viewed as a rite of passage by many. This annual influx of young people from all over Canada has resulted in Jasper being declared the sexually transmitted disease capital of Canada. It has also caused extreme overcrowding in shared, temporary accommodations, due to high rents and the lack of affordable housing. Understandably, this influx has local parents worried about the potential negative influence of these university-aged youth on their high school and junior high-aged children. Clearly, community residents are concerned about their children. They are concerned about their ability to remain in the communities in which they grew up, or their ability to do so without making significant sacrifices to their own well-being. In many isolated, rural communities, there are few opportunities to obtain post-secondary education. As well, for those that go away to obtain more schooling or training, there may be few opportunities in their home communities to apply such new knowledge and skills.

The human capital issue is the second cross-cutting or universal theme. Nearly all our communities faced challenges in matching the skills and education they wanted their children to have with the opportunities to use those skills locally. For isolated rural communities the issue is not simply to find training opportunities to enhance the skills of local people, particularly youth. The challenge lies in providing a match between those skills and a place to apply them. The difficult choices in this regard have already been laid out for parents in subsistence communities, but the same holds true in other rural communities as well. People are concerned with youth outmigration, but when people are given training in hi-tech fields where there are no local prospects for employment, it is not surprising that people leave, or stay away if they left for their training. Where there may be opportunity in this regard is in training youth in small business development. Several of our communities, Peace River and Queens, for example, are under-serviced and continue to lose their commercial base.

Another universal theme that flowed more from our narrative data than our census data, is the distribution of wealth in the community. This was most apparent in Hinton, where there is a fairly wide gap between what the locals call, “haves” and “have-nots”. Aggregate data on income distribution may mask a wide standard deviation on the income variable. That is why it is also important to look at poverty rates. It is not uncommon to see high average income, but also high poverty rates in the same community. Particular attention will be given to distributional issues in the recommendations to communities, government and industry to follow.

Management implications

The management implications of this work differ depending upon the institutional agent in question. Our findings suggest certain actions that might be taken by industry, by government, and by local community actors themselves. While there is some degree of overlap, there are also key differences in the roles these institutional agents play in community sustainability. Because

we recognize this, we will treat the management implications for each of these three groups separately.

Management implications for government

It became clear to the research team through the course of the field work and the process of sifting through secondary data that economically diverse communities appear to enjoy better outcomes with respect to both quantitative measures of objective indicators, as well as subjective assessments of local prospects. For example, people in diversifying economies such as Fort Liard and Queens felt that the new and emerging sectors in their economies provided new opportunities to improve prospects for nearly everyone. There was some concern over the rapid pace of development in Fort Liard, and the long-term prospects of sustaining the current boom, but there was near consensus on the notion that the diversification of the economy was healthy. Similarly in Queens, there were some questions about wage levels, seasonality, and the flow of benefits from the tourism economy, but most people agreed that the diversification of the economy was healthy for the region. Peace River and Hinton, two of the diversified communities in the sample were consistently ahead of the pack on many of the objective indicators such as income and employment.

Provincial governments have many potential avenues for encouraging economic diversification. Unfortunately, such efforts are rarely coordinated and individual departments attack the problem in a piecemeal fashion. Natural resource agencies may be concerned with development and diversification of industries and products within the forest sector. Provincial tourism promotion functions are often paired with economic development or economic diversification functions in a single ministry. As well, human resource departments may have their own unique approaches to local economic diversification. There are only a few provinces that have ministries expressly devoted to rural issues and even these do not always take a coordinated approach to problems. Community sustainability is a function of capital endowments, such as human capital, natural capital, physical capital (infrastructure), and financial capital. Unfortunately, responsibility for these capital endowments are spread across departments of human resources, natural resources, economic development, transportation, and finance. Better coordination of provincial departments involved in rural development and economic diversification would be a start.

That said, piecemeal efforts to promote economic diversification are better than none at all. Often rural communities lack the information and networks that would enable them to capitalize on opportunities related to the changing global economy. Production is becoming increasingly de-coupled from geography. That is, a growing proportion of the wealth generated in national or provincial economies is in information technology, or business services that could really be located anywhere. This trend will likely continue and could offer opportunities to rural places, particularly those with high environmental amenity values, to attract new firms in the high-technology and information technology sectors. Provincial governments often serve as partners or promoters of new business development, and as such, they could direct economic growth toward areas that most need employment.

One of the factors holding back rural places are the lack of skills and education required to seize opportunities and compete in the emerging economy. This is something of a "chicken and egg" problem. Those rural youth that do receive post-secondary training usually move to cities because that is where the jobs are. Firms are often reluctant to locate in rural areas (except when a non-skilled, low-wage labour force is required) because of low levels of skills and training. Therefore, provincial governments could also play an important role in ensuring adequate levels of human capital development in rural regions. This refers to adult education and retraining as much as youth education. Distance learning is opening new doors to individuals and presenting them with opportunities to receive training that will facilitate their move into growing economic sectors as opposed to remaining mired in declining sectors. Provincial human resource and education departments should continue to make human capital development a priority.

With respect to forest management, some experimentation may be considered that would take socio-economic outcomes, rather than forestry based outcomes as evaluation criteria. More explicitly, provincial natural resource ministries may wish to experiment with alternative forms of forest tenures of Crown land to see if there are different approaches to organizing the forest sector that would lead to greater local economic benefit and greater community sustainability. There appears to be increasing demand for such experimentation, and some provinces such as British Columbia and Ontario are responding with pilot community forestry programs. Other experiments with encouraging results, such as the forest tenant farming project in the Bas St. Laurent Model Forest, are also ongoing and deserve closer scrutiny and perhaps replication.

Management implications for industry

The organization of resource extractive industries in Canada has evolved into a partnership between government and industry. In this partnership private industry takes a great deal of responsibility for stewardship of public resources. This is true of mining and forestry in particular. While industry has formal responsibilities for forest stewardship and management under a wide array of Crown land licenses and tenures, there are virtually no formal requirements for companies to take responsibility for the communities that depend upon the forest industry.

In the past, many timber-dependent communities were operated almost as private fiefdoms of the companies who held the local Crown license. Until very recently, Pine Falls remained a company town. Only with the most recent sale of the mill in 1998 did that status change and the community is now in the process of amalgamating with an adjacent political unit. Pine Falls was a bit of an anachronism, however. Most forest products companies got out of the business of "town management" in the 1960s and 1970s so that they could focus on forest management. In the process, they abdicated much responsibility for local community development and well-being (see Beckley 1996).

The result of the widespread change in policy with respect to local management and operation of communities is that many of these places floundered. Mills continued to employ many workers at high wages and contributed substantially to local municipal tax bases. This

allowed timber communities to sometimes "buy their way out of problems." Other factors that contribute to community sustainability, however, such as volunteerism, entrepreneuriship, and strong local leadership were lacking and this deficiency is in part due to the legacy of paternalistic corporate control of timber communities in the early and middle parts of the last century.

From a broad perspective - one that encompasses corporate policy and community policy -the challenge is to strike a balance between corporate contributions to community sustainability and what some might view as corporate "meddling" in community affairs. A number of suggestions for industry have already been laid out in another publication (Beckley and Reimer 1999). Many of the recommendations and suggestions are drawn from observations made in our NCE case study communities. Since they contribute to the discussion on how to find that balance and the appropriate degree and type of corporate intervention to support community sustainability they are presented in an abbreviated version below.

- Actively support and sponsor human capital development. Companies typically have supported work related training and technical skills upgrading for its labour force. Our suggestion is to expand their support to include active support for adult education more broadly in their labour force (e.g. not simply technical competence). This is due in part to the fact that many older employees by-passed opportunities for university or other more general forms of post-secondary education in order to take jobs at the mill. Secondly, we recommend companies support adult education for the entire community, not just for their labour force. A community with a diverse set of skills and abilities will be better equipped to deal with social and economic change in the future.

- Actively support programs that nurture a healthy population. A healthy community means a healthy labour force. Promoting health early in life will create significant savings down the road if unhealthy activities are less a part of local culture. Smoking, drinking, drug use, as well as exercise, and attention to nutrition are all learned behaviours and companies can promote greater productivity in their own workforce and more sustainable communities by supporting healthy lifestyles in their host communities.

- Actively support and sponsor leadership development. Leadership is a unique form of human capital. Some consider it to be innate, but it is also a learned behaviour. In the past, companies preferred ignorant and docile local populations. Companies wouldn't think of developing leadership skills in their wage labour force for fear that those tools would be turned against them in collective bargaining. Today, leadership means team building skills, self-actualization and personal development that will encourage people to solve their own problems, either on the job or in their communities, rather than looking for external solutions. Again, companies should support leadership training both within their labour force and within the community more broadly. This can be done through sponsoring workers to take leadership training courses, by bringing such seminars and workshops into the mills and

making them available to other community members, by offering matching funds for starting up local community groups, or sponsoring mentoring programs for potential leaders.

- Encourage entrepreneurship. Historically, companies had the same reluctance in developing business skills among their labour force and leadership skills. They did not want to lose good people. Today, modern mills require fewer and fewer workers, but wages in those industries remain quite high. This means that the capital accumulated by mill families could be turned into small business start-up funds. This should be encouraged. One of the challenges faced by many of our case study communities (Hinton, Pine Falls, Peace River and Queens to name a few) is the decline of the local commercial sectors. Supporting rather than stifling small business development will create a more balanced, diversified local economy. A place where people will want to come to live and to stay. Labour mobility has always been a concern of industry. Creating sustainable communities is the logical path to take to create a stable, committed labour force.

- Help those least able to help themselves. We found in our case study communities that there was often a wide distribution of the benefits of resource extractive activities. Many associate small rural towns with a more egalitarian social structure, but particularly in industrial pockets in remote rural areas (e.g. mill towns), there are often large gaps with some of our indicator variables between those employed in the mills and those employed in the service or other sectors. Traditionally mills have contributed to the community in ways that have supported their workforce. Often this has merely widened the gap. Targeting the above recommendations regarding leadership development, entrepreneurship and human capital development across the whole community will help alleviate the gap between mill families and non-mill families. As well, companies should provide other types of direct support to institutions in their host communities that benefit those most in need. For instance, rather than supporting youth hockey or the local ATV or snowmobile club (activities that mill employees may be actively involved in), support women's shelters, food banks, employment re-training programs, meals on wheels or other similar activities. Initiatives that benefit seniors, single mothers, the unemployed and permanently disabled will make communities better places to live and in the long run contribute to more stable labour forces for industry. If the quality of life is high in a given place, people are more likely to stay.

- Provide all the above services and support to the entire impact area of the mill. Throughout Canada, mills usually draw their wood from a wide area. In the western boreal forest it is not uncommon for a Crown license to encompass millions of hectares, within which dozens of communities exist. In the past, mills have focused their community development efforts in the communities in which their processing facilities existed. Once again, this concentrates wealth rather than disperses it. The result will be internal regional inequality. Companies are increasingly realizing that their responsibility on the community side does not end at the town line of community where their mill is located. Hopefully, this trend will continue.

Management implications for communities

There are a number of management implications for rural communities that we draw from our work. The field work allowed us to view a number of communities struggling with changing global and local conditions. Sometimes communities feel helpless with respect to exogenous change that they view as inexorable. In fact, there are a number of things communities can do to help themselves. Unfortunately, a culture of helplessness has evolved in some communities and people expect either government or traditional industries to tackle community-wide problems. In this era of scaled-down governments and increasingly global industries, communities must be prepared to take on more responsibility for their own well-being.

Our research bears out the relative advantage of having a diversified local economy. While most communities realize this, many that are heavily vested in traditional resource sectors do not. Some communities' vision of possible futures are clouded by historical dependencies. Their strategy for economic diversification involves attracting businesses that support or supply traditional commodity producers. The problem with this strategy is that when orders for pulp go down, the pulp mills' orders for chemicals, machinery, and business services go down as well. Communities need to identify economic diversification strategies that compliment rather than compete with existing strengths. Examples of complimentary economic activities would involve businesses that use a different resource base, or that do not compete directly with a similarly trained labour force (e.g. software designers rather than pipe-fitters).

The "chicken/egg" problem with respect to the local skills development and economic diversification has already been referenced. It would not be wise for small communities in rural Nova Scotia or in the northern prairie provinces to invest a great deal of effort in turning their youth into computer programmers in the hope that some information technology firm will locate in their community. The labour embodied in those youths is more mobile than the industries, and therefore, more often than not those newly trained young people will go to where the jobs are, and not wait until the jobs come to their home town. Jobs may come to smaller, metro-adjacent rural places if those communities invest in the proper infrastructure. In the new economy, that infrastructure includes things like fibre optic links, cleaner and cheaper sources of energy (natural gas, thermal power). It also involves social and institutional infrastructure that will create a high quality of life and make a given rural locale a desirable place to reside – good pediatric care, a good school system, and the like. That type of infrastructure will likely attract young families to an area. That sort of infrastructure, the social infrastructure, will be more likely to attract young, educated entreprenurial individuals and families that the construction of another industrial park. Educators and community developers need to continue to keep an eye toward how the global economy is developing and train youth and retrain adults so that they can compete in future, not current labour markets. Eventually, if people are sufficiently attached to where they grew up, and opportunities to apply their skills and knowledge emerge in such a place, more people will stay, or if they have left, some may return.

Another recommendation for communities is to lobby resource management agencies for access or control to publicly owned natural resources. The movement toward co-management in fisheries, forestry and wildlife management is emerging slowly, but with positive results. The demand for more local control is a function of perceived mis-management of resources by government in the past (e.g. the cod fishery) and by the perception that local places no longer benefit as much as they once did from their surrounding resource endowments. In forestry, there are fewer jobs, and they are located further away, and as people watch the log trucks leave, they wonder how the wealth represented in the load might benefit their community were it processed locally. In order for communities to make a strong case that they should have more access or control over local Crown resources, they need to demonstrate resource management capacity. Once again, the issues of available local human capital and community development are linked.

CONCLUSION

Canadian society is increasingly looking to its forests to provide a broad range of values and benefits. Where we once looked to forests primarily for fibre and employment from extracting and processing that fibre, we now look for recreational opportunities, subsistence goods, tourism-based economic development, as well as spiritual connections, heritage values, social meaning, and aesthetics. As science provides greater understanding of ecosystem dynamics, society increasingly recognizes important ecological functions that forests provide such as clean air and water, biodiversity, carbon sequestration and critical habitat for endangered species.

Sustainability of Canadian forest-dependent communities is predicated on the sustainable management of the forest resources upon which they depend. This holds true whether the dependence is based on fibre use, subsistence use, or aesthetics and recreation/tourism use. Our approach in this study has not been to judge in a dichotomous fashion whether communities are sustainable or not. Rather, we approach the concept of community sustainability as a continuum, with any given community sitting along that continuum. Since many of the indicators of community sustainability are not things that one can index or quantify easily or accurately, we do not rank our case study communities relative to one another. Much of the quantitative data do provide comparisons between communities. While we suggest the direction of trends we feel indicate greater sustainability (higher income, lower poverty, higher education, etc.) there are enough complicating factors, such as income distribution, type of education (bush skills versus formal schooling) that we are not comfortable ranking communities relative to one another. Our qualitative data is really the richer source of data regarding the challenges and opportunities for community sustainability in our case study sites. In the appendix, we provide an assessment of community assets and liabilities with respect to sustainability. Forthcoming work will provide greater detail on each case study community. The individual community reports focus much more on the qualitative, narrative data, and therefore elucidate challenges and opportunities for sustainability for each individual community.

There is a wide range of management implications of this research and most are more relevant at the policy level rather than the field level. Our findings lead us to suggest different courses of action for different social and institutional actors. We focus on provincial government, the wood products industry, and communities leaders as these institutional players are central to the creation of sustainable communities. Individual chapters in the forthcoming work will deal with case specific recommendations for Parks Canada, tourism operators, the oil and gas industry, or others where appropriate. Many of the policy issues remain constant, such as economic diversification. We have focused on the different implications for action based on the social or institutional location of the reader.

There are many potential fruitful directions for future work in the area of forest community sustainability. One involves attempting to better quantify and model sectors of the economy that are forest-dependent, but not timber-dependent. This will involve methods to attribute some proportion of the value of tourism and recreation-based activities to the forest, and attempt to determine what proportion of local service sector expenditures are attributable to the presence of local forest resources. In the case of subsistence forest-dependence, the challenge is to refine and improve methods used in Beckley and Hirsch (1997) to quantify the in-kind contributions of the subsistence economy and roll that in to standard accounting. Another challenge for social science researchers working in the area of community sustainability is to link sociological variables with ecological variables in ways that allow us to better understand the assumed links between forest health and community health. To date such linkages have been weak, in part because there is so much statistical "noise" going on in models that attempt to quantify community sustainability.

REFERENCES

Beckley, Thomas M. 1995. Community stability and the relationship between economic and social well-being in forest-dependent communities. *Society and Natural Resources*. 8(3):261-266.

Beckley, Thomas M. 1996. Pluralism by default: Community power in a paper mill town. *Forest Science.* 42(1):35-45.

Beckley, Thomas M.. 1998. The nestedness of forest-dependence: A conceptual framework and empirical exploration. *Society and Natural Resources* 11(2):101-120.

Beckley, Thomas M. and Tracy M. Burkosky. 1999. Social indicator approaches to assessing and monitoring forest community sustainability. Information Report Series of the Northern Forestry Centre, Canadian Forest Service, Edmonton, Alberta. NOR-X-360.

Beckley, Thomas M., and Brian Hirsch. 1997. Subsistence and non-industrial forest use in the Lower Liard Valley. Information Report Series of the Northern Forestry Centre, Canadian Forest Service, Edmonton, Alberta. NOR-X-352.

Beckley, Thomas M. and William A. Reimer. 1999. AHelping communities help themselves: Industry-community relations for sustainable forest-dependent communities,@ *The Forestry Chronicle*. 75(5):805-810.

Burdge, Rabel J. A conceptual approach to social impact assessment. Middleton, WI. Social Ecology Press.

Canadian Council of Forest Ministers. 1997. Criteria and indicators of sustainable forest management in Canada: Technical report. Ottawa, ON. Natural Resources Canada.

Dana, Samuel T. 1918. Forestry and community development. USDA Bulletin 638. Washington, D.C. USDA-Forest Service.

Freudenburg, William R. 1986. Social impact assessment. *Annual Review of Sociology*. 12:451-478.

Freudenburg, William R. 1992. Addictive Economies: Extractive industries and vulnerable localities in a changing world economy. *Rural Sociology*. 57(3):305-332.

Kaufman, Harold F. and Lois C. Kaufman. 1946. Toward the stabilization and enrichment of a forest community. The Montana Study. Missoula, MT. University of Montana. U.S. Forest Service, Region One.

Knight, Rolf. 1975. Work camps and company towns in Canada and the U.S.: An annotated bibliography. Vancouver, BC. New Star Books.

Force, Jo Ellen, and Gary E. Machlis. 1997. The human ecosystem part II: Social indicators in ecosystem management. *Society and Natural Resources* 10: 369-82.

Natural Resources Canada. 1999. Canadian Forest Service: A future as dynamic as its past. Ottawa, ON. Natural Resources Canada.

Power, Thomas M. 1996. Lost landscapes and failed economies: The search for a value of place. Washington, D.C. Island Press.

World Commission on Environment and Development. 1987. Our common future. New York. Oxford University Press.

Appendix 1: Assets and Liabilities for the 9 Case Study Communities

Community	Assets	Liabilities
Queens County, Nova Scotia	A wealth of natural resources – a large, productive forest area, two very large rivers and salt water access from a series of small and medium-sized ports. A diversified economy. While forest related enterprises comprise a crucial share of the economy, new opportunities are slowly emerging (esp. in tourism employment). Strong loyalty and commitment to the region, to family and the quality of life they provide (mainly among non-youth).	The decline of the commercial sector. Several Queens communities have experienced an erosion of their downtown core associated with an increase in out-shopping. The absence of young people in governance and volunteer activities. The out-migration of youth. Youth do not see much opportunity in the current local labour market. .
Alma, New Brunswick	A high degree of entrepreneurialism among the local population. Commitment to place. Residents described a strong sense of community which is expressed through high levels of volunteerism and community initiative. Stability associated with the presence of Fundy National Park, an important employer for residents and the basis of the tourist economy.	A seasonal economy and low wages. Vulnerability to service consolidation. Alma's small size makes the community susceptible to cutbacks and consolidation of essential services. Insufficient infrastructure to cope with the seasonal influx of tourists. Tourism puts undue pressure on the local infrastructure and the community currently does not have the physical infrastructure to match.

Community	Assets	Liabilities
Haut-St-Maurice, Quebec	A strong network of community organizations and associations. Leaders active in the social, cultural, economic and political life of the community. The forest itself, in its contribution to the economic, recreational and spiritual life of the local population.	Lack of economic diversification. There is strong economic concentration around the forest sector. Lack of social integration. The community struggles to keep young residents in the community as well as with integrating newcomers. Lack of people willing to take over leadership positions within the community.
Pine Falls/Powerview, Manitoba	Steady and well-paid employment at the mill. Workers are ensured of a comfortable standard of living. The mill is a major source of revenue for small businesses located in and around these townships. The mill site and woodlands operations brings together people of different (and often divisive) cultural backgrounds into a single community of workers, promoting regional unity and pride	Jobs at the mill are limited mainly to white males who have "put their time in". The business sector is not diverse and entrepreneurialism is weak, in large part due to the historic availability of well-paid mill jobs. Racial and language identity markers continue to divide the communities. This results in a wide range of incomes and considerable variability in material standards of living.

Community	Assets	Liabilities
Peace River, Alberta	Historically strong base as an agricultural community. Peace River's agricultural roots provide a sense of economic and social stability. The diversity of the local economy. Agriculture, forestry and forest products manufacturing, oil and gas, and government services all comprise important sectors of the economy but no single sector dominates. A well-connected (vertically integrated) political and economic leadership appears to provide considerable and far-reaching political and financial strength.	High migration and mobility has negative implications for the development of social capital. A recent, precipitous drop in the local retail economy, related to a greater number of retail opportunities in Grand Prairie and limited expansion possibilities in Peace River's downtown core. A concentrated power structure of local political and economic elites. Although this group can capture resources, they can also limit the scope of issues and concerns that are addressed.
Hinton, Alberta	A abundance of natural resources that has been the primary source of wealth generation in the community for half a century. A high material standard of living. The combination of low unemployment and high incomes has resulted in a high level of material affluence. The people. Hinton is a young community. Employment figures indicate a willingness and ability of the population to participate in the local economy.	Lack of integration between different resource based activities. Non-local actors have significant influence and local input in decision-making is limited. Gap between "haves" and "have-nots". High-wage earners tend to be males, while women are often dependent on their husbands for economic security. High mobility rates and a frequent population turnover inhibits the development of community institutions and a vibrant volunteer sector.

Community	Assets	Liabilities
Jasper, Alberta	Ability to generate wealth from its natural resource base without "consuming" that resource base. Attachment and strong emotional commitment to the place, not only by its populace, but by the entire nation (national park) and the international community (UNESCO World Heritage Site). Extremely high human capital. Unique among rural Canadian communities in its high percentage of university educated residents and low percentage with less than high school.	Lack of social cohesion. The high turnover in the local population, annual influx of temporary residents and visitors inhibits the development of community. External interest in and attachment to the place reduces Jasper residents capacity to determine their own destiny. Parks Canada sets policy, not a municipal council. Escalating real estate prices threaten the continued existence of a resident middle class.
Fort Providence, Northwest Territories	Commitment to place. The people in Fort Providence have strong connections to the community, the land and to their culture. The local leadership. Leaders are well-respected and are thought to consider the interests of the community when making decisions. Plentiful natural resources. Fort Providence has vast resources, both renewable and non-renewable. There is potential for the expansion of many natural resource activities.	Social pathologies such as drinking, violence, apathy and low self-esteem continue to be problems in Fort Providence. Competing land uses. Despite low population density, hunters, tourism outfitters, and resource extraction companies share different visions for how the area's resources should be used. A lack of formal human capital. There are few people with the formal education to take on more highly-skilled jobs.

Community	Assets	Liabilities
Fort Liard, Northwest Territories	A rich natural resource base. The vast expanses of virgin forest are, by northern standards, unusually productive and recent gas finds have been called some of the largest in Canadian history. The strength of local leadership. The band has handled large contracts with the oil and gas industry and has created close to 100 new jobs for local people. The presence of an active subsistence economy. Subsistence activities act as an important safety net for the community especially for those people, such as elders, less suited to the wage economy. Subsistence is also central to the cultural identity of the community.	A lack of formal human capital. The rapid onset of oil and gas development in the area has highlighted the scarcity of people trained in technical and administrative fields. Lack of consensus on the direction and pace of development. Decisions regarding resource development are in the hands of the band leadership and there some dissatisfaction with the degree of community involvement in decision-making. Long-term employment stability. Once the pipeline is constructed, few local people will likely be employed through the oil and gas sector.