STRONG POLICIES, POOR OUTCOMES
Longitudinal Analysis of Forest Sector Contributions to Aboriginal Communities in Canada

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INTRODUCTION

This paper examines the contribution of forestry and other resource sectors to the social and economic status of Aboriginal communities in Canada. First, we explore current conditions within Aboriginal communities and the ways in which social and economic status is thought to be related to factors such as size and location of community as well as access to resources, capital, and capacity. The paper also explores the changing relationship between Aboriginal communities and natural resource sectors by presenting results from descriptive statistics and longitudinal analysis of census data. This analysis provides insights into the total levels of employment in the forest sector and the relationship between changing levels of forest sector dependence and changes in social and economic status. Finally, several implications of these trends are discussed with respect to resource sector contributions to the future of Aboriginal communities.

SOCIAL AND ECONOMIC CONDITIONS IN ABORIGINAL COMMUNITIES

Studies of social and economic conditions in Canada reveal a persistent gap between the Aboriginal and non-Aboriginal population. Cooke et al. (2004) constructed an assessment of well-being from 1981 to 2001 that was based on a modified version of the Human Development Index (HDI). Although they found that HDI scores for Registered Indians have improved between 1981 and 2001, they continue to have shorter life expectancy, lower education attainment, and lower average annual incomes than do other Canadians, and the gap in average annual incomes actually increased during this period. According to one estimate, although Canada as a whole is consistently ranked as a top country by the United Nations in the international rankings of the HDI, using the same criteria, Aboriginal people in Canada would be ranked #48 (between Hungary and Venezuela), if they were

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a country unto their own (Beavon and Cooke, 2003).

Other studies also show a consistent pattern of lower social and economic status in Aboriginal communities. For instance, a study by the Ministry of Indian Affairs and Northern Development (INAC, 2000) shows steady gains in education attainment for Registered Indians, but significantly lower levels than the total Canadian population. These differences are similar to other studies and other measures of well-being (Armstrong, 1999; Buffalo, 1997; White et al., 2003). Some attribute these differences to community size and geographic location (remoteness), yet Buffalo (1997) concludes that these common explanations for the marked differences between reserve populations and the Canadian population are not supported by the data.

EFFORTS TO IMPROVE THE WELL BEING OF ABORIGINAL PEOPLE

Since the *Constitution Act* in 1982, the Canadian courts have contributed to an emerging understanding of Aboriginal and treaty rights that extends to the ownership and self-government of lands and resources. In addition to these significant re-interpretations of rights within the court system, the Royal Commission on Aboriginal Peoples (1996) has contributed to an understanding of Aboriginal issues within the broader public policy framework in Canada. Coupled with strong population growth rates in Aboriginal communities across the nation, Aboriginal Peoples are playing an increasingly prominent role within national discourses — exerting claims to ownership and control of Aboriginal lands and territories.

The Role of Forestry

One of the areas of particular interest, especially as it relates to economic development, is the relationship between Aboriginal communities and the natural environment. The struggle for greater control over traditional lands is particularly acute within forest regions of Canada where, by one estimate, 80% of Aboriginal communities are located (RCAP, 1996). According to the 1991 labour force survey, over 10,000 Aboriginal people were employed in the forest sector (Brubacher, 1998). Hickey and Nelson (2005) claim that these 1991 employment figures represent 2.2% of the Aboriginal population in Canada and they go on to suggest that "this figure has no doubt increased since 1991 as First Nations have become more commercially active and as education and training levels among Aboriginal people have improved" (p. 5).

As a means of enhancing the social and economic conditions in Aboriginal communities, there are substantial efforts on many levels to forge a stronger relationship between forest lands and resources. This includes numerous initiatives associated with traditional ecological knowledge (Manseau et al., 2005), tenure reform (Ross and Smith, 2002), community economic development (Goodfellow-Baikie and English, 2006), and land use planning (Whitefeather Forest Initiative, 2006).

In the post-constitutional era of the 1980s and 1990s, several policy initiatives within the forest sector began to place Aboriginal issues on the development agenda within the forest sector. Developed in 1992, the National Forest Strategy placed a strong emphasis on economic development within Aboriginal communities (CCFM, 1992). As a major strategic undertaking (with participation from the federal government, provincial governments and numerous Aboriginal, industrial, and other civic organizations), the 1992 Strategy represented a broad-based consensus on the direction of forest development in Canada. Strategic direction seven makes a commitment to "increase forest-based economic opportunities for Aboriginal people" (p. 41), stating that:

> Self-sufficiency of Aboriginal communities through economic development requires increased access to resources and business development support as well as the preservation of traditional activities. (p. 41)

In another national policy process, the Canadian Council of Forest Ministers (1995) identified a set of criteria and indicators of sustainable forest management, whereby respect for Aboriginal and treaty rights and participation by Aboriginal communities in sustainable forest management are key elements. Although this national policy framework on sustainable forest management did not address a wider range of interests and concerns within the Aboriginal forest community,

it did identify a direct link between the forest sector, forest management practices, and the social and economic conditions of forest-based Aboriginal communities. These connections between Aboriginal people and their forest landscapes extend to rich cultural and social histories, but there are some clear signs that the economic linkages became much stronger in the late 1980s and early 1990s than at any time in recent history. After more than a decade of national policy development, some evaluation of impacts within Aboriginal communities is clearly needed.

Paths to Development: Forestry Not a Cure All?

The reasons for lower social and economic status in Aboriginal communities are varied and complex with numerous connections to the colonial legacy within North America and the assimilation policies of the Canadian government. These points of connection are also congruent with research in other parts of the world that has attempted to understand the reasons for poverty and underdevelopment. Scholars have identified a litany of factors associated with poverty in the United States (Rural Sociological Society Task Force on Persistent Rural Poverty, 1993). These include structural theories of rural economic underdevelopment, neo-classical economic theories of human capital, and theories of differential power relations in rural and resource-based communities. Within the international development literature, scholars have also identified a negative relationship between the export of raw materials and socio-economic status. In other words, countries and regions with higher rates of resource extraction, coupled with weak institutions, correspond with low social and economic status (Mehlum et al., 2006). Given their close proximity to extractive industries, this so-called 'resource curse' may be a factor within many Canadian Aboriginal communities as well.

One of the obvious pathways of development for Aboriginal communities involves the utilization of natural resources in ways that benefit local communities. There is a growing number of Aboriginal partnership agreements within the Canadian forest sector that are intended to contribute more directly to the local economic outcomes. Hickey and Nelson (2005) review results from two surveys conducted by the National Aboriginal Forestry Association and the Institute of Governance where over 40 such partnerships are discussed in some detail (this represents a subset of 400 to 600 Aboriginal-owned businesses that have been identified by the National Aboriginal Forestry Association as working in the forest sector). These partnerships include joint ventures, memoranda of understanding, co-operative businesses and contracting. Some of the most important developments have taken place in British Columbia, where enhanced Aboriginal involvement in forestry is resulting from tenure reform and the re-allocation of ownership and control of forest resources to Aboriginal communities (British Columbia Ministry of Forests, 2006). These enhanced partnerships represent a larger trend within Aboriginal community economic development where "bands use outside expertise to build capacity; and to create viable joint ventures" (Goodfellow-Baikie and English, 2006, p. 225).

On a more pessimistic note, however, Ross and Smith (2002) suggest that Aboriginal tenure reform is painfully slow and clearly not a political priority. They state that "the provincial systems of tenure are a structural and systematic impediment to the recognition and protection of Aboriginal and treaty rights in forest management in Canada" (p. 1). Given the slow pace of tenure reform, this pathway to development represents a strong challenge to policy makers and resource managers. Currently, notwithstanding tenure reforms in British Columbia, the focus for most policy makers appears to be on training and employment opportunities in Aboriginal communities that serve to enhance capacity to participate in the forest sector economy (Ross and Smith, 2002).

With regard to poverty and underdevelopment in Aboriginal communities, Kendall (2001) suggests that several key factors are important to consider. Consistent with the discussion above, access to resources and capital represent some key pathways to development in this context. "The main sources of revenues, as would be expected, are tied directly to the resources that the First Nations presently control. This means that the majority of opportunities presently lie in the natural resource sector" (p. 52). In addition to these factors, Kendall also points to issues of job market discrimination, lower levels of educa-

tional attainment, and remoteness of many Aboriginal communities as factors that are also important contributors to underdevelopment.

In spite of the close connection between Aboriginal communities and the forest landscape, several recent studies suggest that this close proximity does not necessarily translate in any direct way into social or economic dividends for Aboriginal communities. For instance, using data from the 1996 Census of Canada, Gysbers and Lee (2003) found that Aboriginal communities within forested regions of Canada experienced poorer social and economic conditions than the national average for Aboriginal communities. Furthermore, they also found significantly lower levels of well-being in Aboriginal communities within commercial forest zones (the approximate area within which the forest industry operates). "Aboriginal communities within the commercial forest zone were shown to have significantly lower average incomes than Aboriginal communities within forest regions but outside the commercial forest zones" (p. 4).

In another study of forest dependence and community well-being in Canada, the Canadian Council of Forest Ministers (forthcoming) report four key measures of well-being in forest-based communities (economic diversity, education attainment, employment rate, and incidence of low income). In a comparison of forest sector dependent and non-dependent Aboriginal communities, forest sector dependent communities were generally not any better off than non-dependent communities (with the exception that economic diversity and the incidence of low income was significantly higher in forest sector dependent communities).

Given the evolution of Aboriginal and treaty rights within Canadian society, the development of clear policy statements toward Aboriginal interests within the forest sector, the growing partnerships between forest sector initiatives and Aboriginal communities, along with an understanding of the role of the natural resource sector as a pathway to development, there are important reasons to examine the changing relationship between Aboriginal communities and resource-based industries. This longitudinal and multivariate examination not only provides some information about the outcomes of recent policy and development initiatives at the intersection between forestry and Aboriginal communities, it also contributes to a more general understanding of social and economic change within forest-based Aboriginal communities. The next section maps out our approach to this analysis.

DATA AND VARIABLES

Data for this analysis comes from the Census of Canada and is organized into two distinct files. The first file, which we use to explore contemporary social and economic status, includes data from the 2001 Census only, with records available for a total of 5710 census subdivisions (CSD).[1] Of the 5710 CSDs in the 2001 Census, urban areas were removed as well as communities with a population of less than 65, leaving a total of 3814 CSDs. Aboriginal CSDs were identified in two ways: designated by Statistics Canada as Aboriginal (n = 572) or reported to have more than 50% of residents with Aboriginal ethnic origin (n = 141). This file of 713 Aboriginal CSDs provides the basis for analysis of differences in socioeconomic status between Aboriginal and non-aboriginal communities and differences between forest dependent and non-forest dependent Aboriginal communities in 2001.

The second file includes data from four census periods (1986, 1991, 1996, 2001), and it is constructed to include only those CSDs that have consistent boundaries over the four time periods. This dataset was developed and maintained by The New Rural Economy Project at Concordia University (NRE, 2006) and it provides an opportunity to observe changes within CSDs over a 15 year period without the confounding issues of CSD boundary changes that occur from one census period to the next. The file contains a total of 533 Aboriginal CSDs and it serves as the basis for longitudinal analysis within Aboriginal communities. This analysis involved a method called repeated cross-sectional design where data for each period is regarded as a separate cross-section, but because the cases are comparable from one period to another, comparisons between and among cases are possible (Menard, 2002). All statistical analysis was conducted using SPSS Version 12.0.1.

Indicators of Socioeconomic Status

Although the range of variables under investigation is clearly inadequate to address the wide-

ranging social and economic objectives associated with Aboriginal community well-being, this study takes advantage of available data in a fashion that is consistent with published research. Buffalo (1997) and Armstrong (1999) use a measure of employment, average income, education attainment and housing density in their analysis. Specific variables differ slightly between authors, but this approach to the measurement of social and economic status in rural Canada is also consistent with other published research (Parkins et al., 2003; Stedman et al., 2005).

Measuring Sector Dependence

Measuring the extent of community dependence (or reliance) on a sector of the economy can be calculated in several ways. Most studies have focused either on employment or income-based measures (economists in particular tend to focus on income, rather than employment). Also, dependence can be assessed as a percentage of all employed residents in a community. For instance, one might calculate that 20% of all employed residents work in the government sector. An alternative to this approach involves economic base theory, which utilizes 'inputs' into the economy, rather than re-circulation.[2] In this study, we used an employment measure (rather than income) that is derived from economic base theory (White et al., 2003) and we focused on the contribution of resource sectors (agriculture, fishing and trapping, forestry, mining, and energy) as well as two other key sources of employment income within Aboriginal communities (government employment and transfer payments).

Control variables

The control variables that are used within the regression analysis are derived from a review of published studies that have examined factors contributing to variation within socioeconomic status in Aboriginal communities. For instance, Armstrong (1999) and Buffalo (1997) examine the influence of community size and geographic location as a factor in socioeconomic status. Kendall (2001) suggests that location theory (access to resources and markets) has played an important role in understanding these differences. Population size, metropolitan influence zone (a measure of economic influence of urbanized areas), the percentage of population that is between zero and 14 years of age, and the percentage of population with less than grade 9 education (Johnson and Stallman, 1994) are all included in the analysis as contributing factors to family income within Aboriginal communities.

RESULTS

Aboriginal Conditions in 2001

Consistent with previous assessments, analysis of data from the 2001 Census of Canada reveals a sharp distinction between the social and economic status of Aboriginal and non-Aboriginal communities. In Table 1, results are reported for all communities that are outside of census metropolitan areas, by region. In Canada as a whole, the unemployment rate in Aboriginal communities was 28.3% compared to 14.0% in non-Aboriginal communities. These higher rates of unemployment are consistent across all jurisdictions with the most striking difference in Saskatchewan and Alberta. Differences in family income are also significant in most regions, with the exception of the Territories, where incomes in Aboriginal communities are more comparable with other communities. Consistent with previous studies, other measures of status (such as education attainment and housing density) in Aboriginal communities are also significantly lower than other communities.

Although it is instructive to determine the social and economic distinctions between Aboriginal and non-Aboriginal communities in rural Canada, this has been demonstrated elsewhere (INAC, 2000; Cooke et al., 2004). Our current concerns are based on the potential socioeconomic distinctions between different types of Aboriginal communities. Because the contribution of forest sector activity to Aboriginal communities is the primary focus of this paper, Tables 2 and 3 provide information specific to forest sector contributions. In Table 2, the presence of forestry is defined by a greater than zero percent base employment within the forest sector. The Census of Canada reports forest sector employment in 145 of the 690 Aboriginal communities where data is available in 2001 (713 Aboriginal CSDs were identified but only 690 CSDs contained detailed census data). The highest num-

Table 1. Socio-economic differences between Aboriginal and non-Aboriginal census subdivisions, by region in 2001

Region		*Type (n)*	*Unemployment rate*	*Median family income*	*Persons in private dwellings*	*Percent of pop. 0–14 years*
Atlantic	Aboriginal (28–35)	37.6[3]	34,058[3]	3.2[3]	30.2[3]	20.0
	Non-Aboriginal (571–660)	26.7[3]	44,329[3]	2.7[3]	17.4[3]	21.7
Quebec	Aboriginal (36–42)	21.1[3]	41,386[3]	4.1[3]	36.1[3]	33.3[3]
	Non-Aboriginal (939–991)	12.9[3]	47,628[3]	2.5[3]	18.0[3]	24.7[3]
Ontario	Aboriginal (28–51)	26.0[3]	31,929[3]	3.4[3]	33.8[3]	25.5[3]
	Non-Aboriginal (284–294)	7.7[3]	58,953[3]	2.6[3]	19.0[3]	11.8[3]
Manitoba	Aboriginal (60–72)	27.7[3]	28,481[3]	3.8[3]	36.8[3]	27.9[3]
	Non-Aboriginal (184–186)	5.9[3]	49,700[3]	2.5[3]	20.0[3]	16.7[3]
Saskatchewan	Aboriginal (81–111)	31.6[3]	26,750[3]	4.0[3]	38.5[3]	23.9[3]
	Non-Aboriginal (440–636)	8.1[3]	51,741[3]	2.5[3]	19.0[3]	14.9[3]
Alberta	Aboriginal (34–48)	28.0[3]	27,949[3]	4.2[3]	39.5[3]	27.2[3]
	Non-Aboriginal (220–280)	6.7[3]	57,415[3]	2.6[3]	20.1[3]	9.6[3]
British Columbia	Aboriginal (38–126)	30.5[3]	33,687[3]	3.2[3]	28.4[3]	18.1[3]
	Non-Aboriginal (186–197)	11.4[3]	56,192[3]	2.4[3]	18.3[3]	7.2[3]
Territories	Aboriginal (7–12)	21.0[3]	46,554[1]	3.5[3]	32.9[2]	28.8[3]
	Non-Aboriginal (46–61)	12.7[3]	63,028[1]	2.5[3]	23.3[2]	4.0[3]
CANADA	Aboriginal (351–541)	28.3[3]	33,006[3]	3.6[3]	34.3[3]	24.6[3]
	Non-Aboriginal (2831–3256)	14.0[3]	50,234[3]	2.5[3]	18.6[3]	18.1[3]

Note: 1 = $p < .05$; 2 = $p < .01$; 3 = $p < .001$

bers of forestry communities are in British Columbia (n = 39) and the average percentage of community residents employed in the forest sector is the highest in the country at 5.6%. Compared to the total number of Aboriginal communities in each region, Alberta and Quebec report the highest proportion of communities that contain some level of employment in the forest sector (49% and 53% respectively).

Within the 145 Aboriginal communities where forest sector activity is reported, a total of 4,210 people in the year 2001 were employed in the sector. This employment generated income of close to $100 million and a little over 3% of total income within these communities. These numbers are contrasted with the rest of Canada where close to 335,000 jobs and $13 billion was reported to derive from the forest sector. The relative contribution of forestry to Aboriginal communities is similar to the total contribution of forestry to the rest of Canada.

Differences Between Aboriginal Forest Dependent and Non-forest Dependent Communities

When comparing differences between Aboriginal communities with employment in the forest sector and those without forest sector employment (Table 3), several trends become evident. First, although there are some marginal differences between forestry and non-forestry communi-

Table 2. Presence of forestry in Aboriginal communities by region in 2001

	No Forestry No.	*Forestry No. (%)*	*Percent Forest Sector Dependent Mean (%)*
Atlantic	38	9 (23)	2.9
Quebec	32	17 (53)	4.4
Ontario	54	12 (22)	4.3
Manitoba	67	9 (13)	1.6
Saskatchewan	84	30 (36)	4.2
Alberta	41	20 (49)	4.4
British Columbia	174	39 (22)	5.6
Territories	55	9 (16)	1.8
CANADA	545	145 (27)	4.1

ties, most of these differences are not statistically significant. With the exception of a significantly younger population in non-forestry communities in Quebec, there are no significant differences in the number of persons in private dwellings, percent of population between 0 and 14, and percent of population with less than grade 9 education. Where the differences are slightly more significant between forestry and non-forestry communities appears to be in relation to median family income. In Atlantic Canada, for instance, family income in forestry towns is significantly lower than in non-forestry towns. In contrast, forestry towns in Saskatchewan have significantly higher incomes than in non-forestry towns. In all other jurisdictions, however, differences in income are not significant. Given these results from the 2001 Census, the presence of forest sector employment appears to play a relatively minor role in the enhancement of Aboriginal socioeconomic status.

Changing Aboriginal Conditions from 1986 to 2001

As a starting point for the longitudinal analysis between 1986 and 2001, variation in total forest sector employment is reported in Table 4. It is important to note that this analysis is based on a total of 533 CSDs with constant boundaries between these four census periods and it does not reflect the total number of CSDs with forest sector employment in any given census year.

A more in-depth analysis of this data shows that the presence of forest sector activity is not particularly stable between 1986 and 2001. About 20 communities maintained some level of forest sector activity over the 4 census periods and 80 communities reported the presence of forest sector activity only once during that time. These results suggest that employment in the forest sector is a fleeting occurrence for many communities with only a hand full of Aboriginal communities across the country maintaining some level of forest sector dependence over multiple census periods.

Finally, we turn to multivariate analysis, examining the contribution of the forest sector to well-being, net of the influence of other variables. The linear regression model that is reported in Table 5 provides some insights into the contribution of various economic sectors to median family income over four census periods. Constructed as a repeated cross-sectional design, the major variables in the model include the contribution of various resource sectors (forestry is most germane to our interests, but we also include agriculture, fishing and trapping, mining, and energy), the contribution of two government sectors, and the contribution of a series of controls (or factors) that are thought to help explain variation in family income.

Results for the year 2001 show, for instance, that for every percentage point increase in for-

Table 3. Socioeconomic differences between forestry and non-forestry Aboriginal CSDs, by region in 2001

Region	*Type (n)*	*Unemployment rate*	*Median family income*	*Persons in private dwellings*	*Percent of pop. 0–14 years*	*Percent of pop. with < grade 9*
Atlantic	Forestry (8)	43.8	21,082[2]	3.1	28.0	21.5
	Non-forestry (20–29)	37.0	31,898[2]	3.2	30.3	19.2
Quebec	Forestry (13)	23.6	35,279	3.8	31.6[1]	28.8
	Non-forestry (23–29)	23.6	36,653	4.2	38.2[1]	35.3
Ontario	Forestry (9)	29.9	24,088	3.5	33.1	33.7
	Non-forestry (19–49)	25.4	28,170	3.2	32.6	22.6
Manitoba	Forestry (9)	28.9	24,170	3.8	36.2	24.0
	Non-forestry (51–64)	27.5	22,993	3.9	36.8	28.5
Saskatchewan	Forestry (29)	30.1	24,830[2]	4.0	38.3	24.3
	Non-forestry (52–83)	32.1	19,449[2]	4.0	38.4	24.0
Alberta	Forestry (17)	25.4	24,244	4.1	39.4	22.4
	Non-forestry (17–32)	29.4	20,784	4.1	38.8	28.8
British Columbia	Forestry (30)	29.6	27,942	3.3	28.5	16.8
	Non-forestry (8–120)	34.0	32,012	3.2	28.6	17.5
Territories	Forestry (9)	20.1	41,432	3.1	28.7	25.4
	Non-forestry (37–55)	22.3	37,642	3.6	32.4	30.0
CANADA	Forestry (124)	28.7	27,460	3.7	33.5	23.3
	Non-forestry (227–461)	29.3	27,323	3.6	33.8	24.2

Note: 1 = $p < .05$; 2 = $p < .01$; 3 = $p < .001$.

Table 4. Number of CSDs with employment income from the forest sector, by census period

Proportion of total forest sector employment income within the CSD	*1986*	*1991*	*1996*	*2001*
Greater than 0% (n)	52	68	130	107
50% or greater (n)	2	0	15	6
20 to 49% (n)	32	11	59	4
10 to 19% (n)	18	57	56	60
Mean forest dependence (%)	3.1	3.2	7.4	4.5

est sector employment, median family income declined by $42; while for every percentage point increase in mining sector employment, median family income increased by $547. In other words, after controlling for other variables (such as population size and the influence of metropolitan areas), the contribution of forestry to family income was found to be insignificant while min-

Table 5. Regression of median family income on employment in resource sectors and other sectors, 1986 to 2001

	1986			*1991*			*1996*			*2001*		
Parameter	*Effect*	*Standard Effect*	*Sig.*	*Effect*	*Standard Effect*	*Sig.*	*Effect*	*Standard Effect*	*Sig.*	*Effect*	*Standard Effect*	*Sig.*
Intercept	27,388		.000	29,794		.000	29,635		.000	39,344		.000
Resource sectors												
Agriculture	–169	–.105	.043	–49	–.020	.717	164	.069	.164	27	.013	.763
Fishing and trapping	–77	–.114	.056	85	.096	.085	77	.086	.087	84	.084	.055
Forestry	42	.056	.362	113	.095	.083	117	.117	.019	–42	–.033	.446
Mining	210	.077	.118	633	.181	.001	352	.127	.009	547	.205	.000
Energy	76	.044	.396	985	.176	.001	699	.249	.000	880	.179	.000
Other sectors												
Government transfers only	–129	–.624	.000	–42	–.140	.011	–49	–.123	.016	–38	–.086	.045
Government	–23	–.057	.328	124	.232	.000	167	.334	.000	223	.423	.000
Control variables												
Population	.714	.122	.026	6	.316	.000	5	.277	.000	3	.174	.000
Metro Influence Zone	n/a	n/a	n/a	680	.097	.120	449	.060	.276	311	.047	.301
Percent of pop. 0–14	–23	–.030	.625	–427	–.409	.000	–455	–.394	.000	–664	–.493	.000
Percent of pop with < grade 9	–55	–.144	.021	–34	–.064	.350	32	.046	.438	18	.021	.650
	Adjusted R-Square = .489 F value = 22.3 N = 222			Adjusted R-Square = .348 F value = 13.0 N = 247			Adjusted R-Square = .360 F value = 15.5 N = 285			Adjusted R-Square = .490 F value = 27.9 N = 308		

ing was found to be highly significant and positive.

In examining results of the regression model over all four time periods, some important trends are evident. Within the resource sectors, the contribution of mining and energy to median family income were highly positive, with increasingly strong effects from one period to the next (especially for mining). The trend for employment in agriculture is also quite evident, where the effect was negative in 1986 and then becoming insignificant in later census periods. The effects from fishing and trapping employment as well as forestry employment are negligible, with these sectors making almost no significant contribution to change in median family income over the four census periods. In contrast, the impact of employment in government jobs has changed from a negative effect in 1986 (standardized effect = –.057) to a very positive effect in 2001 (standardized effect = .423). This result contrasts sharply with the expected negative effect of government transfer payments on median family income.

Results from the control variables are also important to examine. In this regression model, the strongest downward pressure on median family income comes from two control variables (percentage of population 0 to 14 years, and percentage of population with less than grade 9 education). These strong negative effects were consistent across all time periods for the age variable but the effect became insignificant for the education variable in later census periods. Consistent with other studies, the size of the community (population) was found to be a significant factor in predicting median family income, yet the influence of urbanized areas (metropolitan influence zones) was found to be an insignificant factor.

DISCUSSION

One of the overriding themes in this paper is the strong national policy commitment to enhance the relationship between aboriginal communities and the forest sector in Canada. This commitment is reflected in such initiatives as the National Forest Strategy (CCFM, 1992) as well as numerous provincial level initiatives. Notwithstanding these commitments, this national assessment of forest sector contributions to Aboriginal communities reveals relatively weak outcomes. Given that approximately 80% of Aboriginal communities are located within forest landscapes, the proportion of total employment derived from the forest sector is only marginally higher than the national average. Furthermore, the socioeconomic status of forest dependent Aboriginal communities hardly differs from Aboriginal communities where no forest sector employment is reported.

Consistent with previous research, this study found marked differences between the social and economic status of Aboriginal and non-Aboriginal communities. Previous authors such as Armstrong (1999) and Buffalo (1997) have examined the role that community location and access to resources can have on socioeconomic status. Although we found that community size is an important explanatory variable, the location of a community (in terms of the influence of metropolitan areas) was found to be insignificant. This finding is in direct contrast to Armstrong's assertion that "location near urban areas and resource rich areas provide advantages to development" (p. 4). Our results are more consistent with Buffalo's general assertion that size and remoteness of location is an important factor but with limited explanatory power.

Within this model, several economic sectors as well as certain key social conditions have a strong impact on family income within Aboriginal communities. Government sector jobs as well as energy and mining sector jobs appear to play an important (and positive) role. In contrast, the presence of young children within the community places strong downward pressure on family income — a trend that has become increasingly acute in recent census periods.

Given that national forest policies do not appear to correspond with positive social and economic outcomes at the national level, one key issue is to begin understanding the reasons for this disconnection. Are current policies not working? Could it be that forest-based Aboriginal communities may have been worse off in 2001 without these forest policies? Are there some underlying weaknesses in the direction of Aboriginal forestry development that prevent a stronger connection between forestry and local benefits? It is important to note here that the design of this study allows us to examine the connections between policy and outcomes in an indirect way

through the presence or absence of industrial activity. It does not provide an opportunity, however, to compare the differential impacts from forest policy on Aboriginal communities. For the purposes of this analysis, we assume that national forest policy is applied consistently across all regions, and this policy will have an impact on forest industry development. Yet we also understand that a more fine-grained analysis will show that some communities are benefiting from progressive forest policy while others are not. Research into the conditions under which Aboriginal communities can begin realizing more positive social and economic benefits is clearly needed.

Acknowledging the somewhat speculative nature of any discussions about why this disconnection between policies and outcomes has occurred, there are some hints within the published literature that may provide a starting point for further analysis. First, a number of scholars point to the need for stronger institutions as a basis for economic and social growth. In their international assessment, Mehlum et al. (2006), point to the important role of institutions in avoiding the resource curse. At a more local scale, Goodfellow-Baikie and English (2005), point to the role of joint ventures and capacity building within the field of community economic development. Ross and Smith (2002) are also particularly concerned about a lack of institutional development within Aboriginal communities, stating that "Aboriginal Peoples are expected to operate within the framework of the existing industrial tenure and forest management systems . . . the fundamental tenets of [the system] have not been modified to accommodate the particular values, needs and knowledge systems of Aboriginal Peoples" (p. 5). Given the strong role ascribed to institutions by these authors, the lack of positive social and economic outcomes in Aboriginal communities may be attributed to some deficits in this regard.

Second, a lack of institutional development may involve some inertia within certain political and industrial sectors, but there is some evidence that key challenges within Aboriginal communities must also be addressed. In particular, Hickey and Nelson (2005) stress the need for stability in First Nations governance. Quick changes in government can be detrimental to forestry partnerships and recent national survey results suggest that success is limited by a lack of leadership at senior levels within the community and the industry. Accordingly, the extent to which many existing partnerships demonstrate a fairly limited form of institutional development (i.e., contracting and protocols), suggests that more commitment will be required from Aboriginal communities and industry to strengthen these relationships. Discussions about tenure reform in several provinces may provide a basis for reimagining these relationships and building on strengths in the future. Communities such as the West Bank Community Forest, the Cheslatta Community Forest, and the Waswanipi Cree Model Forest are working towards these ends with new approaches to institutional development and tenure reform.

Third, results from this study may be an artifact of data availability and research methods. It is important to note that goals and objectives of most collaborative ventures and co-management structures with Aboriginal communities go well beyond the variables that are used for evaluation in this study. The Whitefeather Forest Initiative (2006), in northeast Ontario, is a case in point. This initiative identifies three primary objects (resource stewardship, economic development, and human capital develop). In addition to forestry, they have also identified opportunities for protected areas, customary livelihoods, minerals, non-timber forest products, and tourism and recreation. This array of objectives reflects the diversity of Aboriginal values and interests on their traditional lands. Our attempts to measure outcomes with a small set of variables that are available through the Census of Canada can only offer a small glimpse into the outcomes that such community-based initiatives are intended to achieve.

CONCLUSION

Within the Aboriginal community context in Canada, forestry was found to have a marginal contribution to social and economic status. Although this outcome is inconsistent with legislative and policy changes over the past 15 years, these results are neither surprising nor are they completely negative. The 2001 Census of Canada reports that forestry did provide employment for approximately 4,200 people in 690 Aboriginal communities and conditions in these communities

would likely be worse if this economic activity had not been present. Also, in other studies of non-Aboriginal communities, forestry was found to have a significantly negative relationship with well-being measures in certain parts of the country and under certain economic conditions (Parkins et al., 2003). The marginally positive contributions of forestry that were found in this study are therefore an improvement to some of the results found in other studies. Lastly, given the focus on national analysis, this study represents a fairly narrow window into the meanings of forest dependence and well-being in Aboriginal communities. In identifying more Aboriginal-specific understandings of well being (Smith et al., 2006), researchers have an opportunity to assess forest development in ways that are much more sensitive and connected to local goals and priorities. As such, Aboriginal peoples do have a strong tie to the forest landscape and local resources, but arguably a different link than that which is represented here.

NOTES

1. The census subdivision (CSD) represents a Statistics Canada jurisdiction that is roughly equivalent to a municipal district. In most cases, the boundaries of the CSD correspond with the boundaries of the town or Aboriginal reserve.
2. Basic activity is measured using the location quotient technique; the ratio of a community's share of employment or employment income in a given sector to the share of employment or employment income in the same sector of a benchmark region. The benchmark represents the level of output from a given sector that is needed for local consumption (Korber et al., 1998).

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