Aboriginal Capacity Building Achievements for Sustainable Natural Resource Development

Final Knowledge Synthesis Report for the Social Sciences and Humanities Research Council of Canada
Acknowledgements

This report was supported by the Social Sciences and Humanities Research Council of Canada and The University of Winnipeg. We are grateful for the expressions of support offered by the Ontario Ministry of Natural Resources, Canadian Institute of Forestry (Manitoba Section), British Columbia Community Forestry Association, and Centre for Forest Interdisciplinary Research. Vital research support was provided by Morrissa Boerchers, Weldon Hiebert and Julia Lawler.
Aboriginal Capacity Building Achievements for Sustainable Natural Resource Development

Final Knowledge Synthesis Report for the Social Sciences and Humanities Research Council of Canada

Suggested citation –

Cover photo credit: Construction of the Keeyask Hydro Generating Station Project, September 2016. Taken by R. Bullock.
Table of Contents

Key Messages ........................................................................................................... v
Executive Summary .................................................................................................. vi
Introduction .............................................................................................................. 1
Implications .............................................................................................................. 2
Research Approach to Knowledge Synthesis ....................................................... 3
Results .................................................................................................................... 4
Research Gaps and Needs ....................................................................................... 21
Knowledge Mobilization ......................................................................................... 22
References ............................................................................................................... 25
Appendices .............................................................................................................. 28
Key Messages

- This knowledge synthesis report provides the first bibliometric profile and systemic review of research on Aboriginal capacity building for natural resource development in Canada.

- Research on and involving Aboriginal peoples in natural resource development and capacity has steadily increased over the past decade, in terms of the number and range of papers, authors, institutions, and cases examined.

- Research output is distributed fairly evenly between male and female lead researchers.

- Research output is widely distributed across the regions of southern Canada (with UBC, Simon Fraser, Manitoba and York having the highest output).

- Sites of Aboriginal natural resource development research are not currently matched with sites of research capacity. Researchers are based in southern and urban Canada, while sites and participants are located in rural, remote and northern areas.

- Current research examines common issues, projects and sites; however, significant variation in research design, data collection methods and reporting styles makes sectorial and case comparisons difficult.

- We identify nine categories of arrangements through which Aboriginal and non-Aboriginal groups collaborate for natural resource development: land use/regional planning; IBAs; MOUs; Aboriginal businesses; joint ventures; Environmental Assessments; revenue sharing agreements; advisory committees; and regional economic councils.

- Land use/regional planning (forestry) and IBAs (mining) are most prevalent arrangements discussed in this sample of research literature.

- Detailed analyses of governance arrangements provides rich context for Aboriginal natural resource development in Canada, however, current Aboriginal capacity research does not provide thorough assessments of capacity or benefits in terms of actual outcomes of collaboration.

- Social and human capitals are the most common forms of Aboriginal capacity discussed in current research. The ability to initiate cross-cultural dialogue and develop trust is a recurring theme in natural resource development project contexts.

- While nearly all papers in this systematic review gave examples of benefits, significant variation in detail and method mean that there is inconclusive evidence.

- Improved consistency of Aboriginal research data collection and reporting is needed to enhance the information base for decision making and tracking Aboriginal achievements in energy, forestry and mining.
Executive Summary

Natural resource extraction is taking place at an unprecedented rate, and this is expected to increase as many countries seek a higher standard of living in combination with rising populations. This will undoubtedly put new socio-economic incentives and pressures on communities and various industries to enhance production in resource rich areas, which often means Aboriginal lands, and in Canada, most likely in the remote and northern regions. Development that respects Aboriginal rights and is culturally appropriate, environmentally responsible, and socio-economically beneficial is a major priority being expressed and demanded by Aboriginal leaders, organizations and communities. However, recognition of rights is not enough for Aboriginal communities to reap the benefits of resource development. The types of governance systems that support sustainable development, from an Aboriginal perspective, are not well understood and are a recent area of scholarship in the Canadian context.

This report provides an analysis of current demands of new governance models associated with the quest for natural resource development, specifically, the capacities required for Aboriginal peoples to meaningfully participate in Canadian resource wealth generation. While it is widely acknowledged that capacity, control and benefits are linked, there is a need to review research evidence to verify current claims and, in turn, inform natural resource policy and practice in Canada. Therefore, the purpose of this report is to assemble existing evidence of Aboriginal capacity building connected with recent collaborative initiatives in energy, forestry and mining, in order to elaborate the forms and levels of capacity, benefits and control Aboriginal people experience. Increasing our understanding regarding the mechanisms that promote long-term, trust-based and benefit-oriented outcomes between Aboriginal and non-Aboriginal peoples, governments, and communities is a major outcome of this research and will facilitate the ongoing promotion of development models that produce sustainable benefits.

In the first part of our research, we used bibliometrics to analyze existing literature in energy, forestry, and mining in order to survey the trends within this area of research. A comprehensive investigation of research articles was undertaken using well-recognized and widely-utilized research databases (i.e., ISI Web of Science and SCOPUS). We used a combination of search terms, including the names of major sectors, ‘Aboriginal’ and synonyms, Canada and provinces and territories, ‘control’, benefits’ and ‘capacity’, and we limited to the last decade to focus on recent initiatives. This search turned up 144 documents, and after application of inclusion/exclusion criteria further reduced our sample to 49 papers. We then gathered information based on established core metrics to produce a robust, high quality database (i.e., year of publication, authorship and gender, author affiliation, journal titles, citation counts and impacts factors, and keywords). Key findings from our bibliometric analysis include:

- Research about Indigenous peoples involved in resource development and capacity has increased steadily over the past decade, with peak output years being 2013 and 2015.
- Of 90 total authors, 56 were male and 34 were female. Male authors led approximately one half (26/49) of the papers analysed, which is consistent with other recent Canadian bibliometrics studies (Bullock and Lawler 2015).
- The top contributing universities were University of British Columbia, Simon Fraser University, University of Manitoba, and York University.
- When comparing researcher institution and research location, a clear pattern emerges: research capacity (and associated jobs and decisions) and output are focussed in southern and urban Canada, whereas the majority of projects under study are located in northern, rural and remote locations.
The second stage of the research included a systematic review of 24 papers in relevant journals to assess Aboriginal capacity building achievements and its relationships to control and benefits. The 24 papers selected from the original bibliometrics sample included those that reported actual findings from particular local and regional cases. Systematic reviews utilize a synthesis-based methodology for rigorously analyzing large amounts of existing research knowledge to create new information. Our approach to research synthesis used theme coding using a coding framework, which we developed to assist classification and open coding. All papers were reviewed to collect details on research methods, locations, partners and stakeholders, types of natural resource development initiatives, as well as forms of capacity, control and benefits. We examined the evidence through a capitals-based approach, considering 5 types of capitals (i.e., social, human, financial, built and natural) to structure our analysis. Key findings from our systematic review include:

- Significant variation was found in the level of detail provided in papers that describe methods (e.g., 9 of 17 papers reported the number of people engaged in interviews, focus groups, and workshops; interview numbers ranged from as many as 63 to as few as 8 participants))
- The research revealed nine categories of arrangements, including: land use/regional planning; IBAs; MOUs; Aboriginal businesses, Joint ventures; EAs; Revenue sharing; Advisory committees; and regional economic council.
- Land use strategies and regional planning processes appeared in one-third of research papers, concentrated in forestry and to a lesser degree energy; Impact and Benefit Agreements (IBAs) were discussed in one-third of papers, primarily related to mining, and were often used in combination with other arrangements, which afforded additional control or avenues to exert influence; the third most cited arrangement was Memorandum of Understanding (25%), found in all major sectors; Aboriginal businesses and Joint Ventures were used in forestry and energy to support business-to-business engagements; Environmental Assessments, revenue sharing agreements and advisory committees provided formal arrangements through which decision-making influence and resources could flow; these were often utilized alongside other arrangements.
- Ten of the 24 articles analysed directly referred to capacity building achievements including: cross-cultural dialogue/communication (top cited – 40% of papers); the role of “champions”/in-house leadership; training; self-governing and decision making capacities; and financial capacity.
- Of the 5 types of capitals, social and human capitals were the ones most often cited, with financial capital coming in third. Built capital was not discussed as a capacity item needed to attract business, but rather as a net gain of development. Natural capital was the least discussed.
- Nearly all papers (22 of 24) in the systematic review gave examples of actual benefits associated with Aboriginal natural resource development initiatives; however, definitions and data varied significantly, making it very difficult to quantify and compare benefits across cases and sectors.
- Employment (12 of 24 articles), improved decision making (11 of 24), financial support (8 of 24) were the top cited benefits.

Our knowledge synthesis approach revealed some key research gaps and needs, including:

- Without monitoring and systematically collected data on capacity and benefits it is very hard to substantiate claims made in previous research. Arguably, a targeted call for research that focuses
on characterizing the relationship between Aboriginal peoples, natural resource development and various benefits and associated arrangements would be valuable.

- Research methods used varied substantially, making it difficult to systematically assess capacity beyond general trends. This points to the need and opportunity for research designs (and resources) that can produce broad comparisons within and across sectors and regions. This would help identify recurring needs as well as prioritize policy actions according to current experience and future scenarios.

- Aboriginal capacity and natural resource development research does not shed much light on the current demographic characteristics of communities linked to rapidly evolving natural resource development arrangements. Analysis of census data, where possible, to assess changes in socio-economic profiles could help to indicate capacity potential and changes.

- There is a clear geographical separation of research capacity and research sites. Our research suggests that there is a need for in-depth examination of research capacity and disparities between north and south, rural and urban, and other domains, to assess implications for Aboriginal capacity development in general, but specifically in research.

- There is a need to fully examine the interplay of institutional arrangements utilized to structure Aboriginal natural resource development. Our synthesis illustrates the complexity of arrangements in some settings, which can be precipitated by the over layering of jurisdictional, sectorial and traditional institutions that shape Aboriginal-settler interactions. In instances where there is more than one arrangement at work, it would be interesting to examine whether there are patterns of conditions or events that led to collaboration over time.

Perhaps a limitation of this research, though intentional by design, is the exclusion of other primary natural resource sectors from this review (e.g., fisheries, agriculture). It could be useful to characterize the sorts of capacities required by Aboriginal peoples and their partners to sustainably manage and benefit from these other natural resources to draw comparisons with the sectors we examine here.

To overcome some of the above identified challenges, perhaps governments and industries need to have a clearing house guided by a common framework for how benefits for Aboriginal communities are assessed in order to enable systematic data collection, assessment and comparison. Addressing these gaps would help better inform decision making regarding Aboriginal capacity building achievements for sustainable natural resource development in Canada.

Effective knowledge mobilization ensures a multifaceted flow of information between researchers, research users as well as other knowledge brokers, creating synergies within and beyond academia, which ultimately leads to positive impacts for society. Results from this project will be disseminated through high impact open access peer-reviewed journals and at conferences, including an upcoming talk at the Canadian Association of Geographers conference in June 2016. Research results will be summarized through video-based interviews that will be edited into a “video abstract” that can be shared with partners. Data will be visualized through simple animations that help bring to life key points from the bibliometrics and systematic review.
1. Introduction

This report builds on previous work regarding how natural resource industries, governments, and Aboriginal peoples are engaging for constructive, practicable and mutually beneficial development opportunities. In particular, we examine the demands of new governance models associated with the quest for natural resource development, specifically, the capacities (i.e., capitals) required for Aboriginal peoples to meaningfully participate in Canadian natural resource wealth generation. To do this we review current research literature regarding types of governance arrangements and associated capacities and benefits that enhance meaningful involvement of Aboriginal peoples in the Canadian natural resources sectors. A systematic review of this literature has yet to be completed and this initiative contributes to the body of evidence that will help inform the interplay between Aboriginal communities and natural resource policy and practice in Canada.

In his 2012 paper, Identifying Barriers to Aboriginal Renewable Energy Deployment in Canada, Krupa highlights how community capacity concerns are both multi-layered and wide-reaching. Capacity has direct implications for Aboriginal involvement in resource development, influencing the ability to effectively participate in everything from high-level strategic policy dialogues and regulatory processes to basic project preparation and work planning. As discussed in the following pages, similar conditions characterize Aboriginal involvement in the mining and forestry sectors.

This report synthesizes existing knowledge regarding Aboriginal capacity in the energy, forestry and mining sectors. It provides a new and holistic evidence base regarding recent developments that characterize the relationships among Aboriginal capacity, control and benefits and how these are enabled through diverse assemblages of institutions, partnerships, and community-based actions. Our analysis also highlights trends in current research and provides context regarding the key papers, journals, authors and universities engaging with Aboriginal communities and natural resource development issues.

By assembling existing evidence of Aboriginal capacity building achievements connected with recent collaborative initiatives in energy, forestry and mining, this report characterises the forms and levels of control, capacity, and benefits Aboriginal people experience, and also points out existing gaps and future research needs.

1.1. Towards Aboriginal Inclusion in Natural Resource Development in Canada

Government and industry interests have historically dominated natural resource and energy development in Canada resulting in the exclusion of Aboriginal peoples from decision-making and benefits. However, new natural resource development opportunities are supporting broader Aboriginal goals for asserting control in traditional territories and economic self-sufficiency. There has been a steady increase in collaborative arrangements, such as Aboriginal owned and operated development corporations, impact and benefits agreements (IBAs), resource revenue sharing, and involvement of Aboriginal governments, residents and businesses in large-scale infrastructure projects.

A move from central government control towards ‘co-management’ and other forms of decentralized and devolved institutional arrangements places local knowledge, values and accountabilities directly in natural resource management. Levels of control and benefits vary depending on each specific arrangement (e.g., contractor vs. resource manager) suggesting that the sets of capacities needed to harness resource benefits and exercise control may also vary. Learning, institutional diversity, and the
ability to work together are key traits needed by societies and individuals engaged in innovative governance arrangements; in turn these qualities are based on social, human, financial, built and natural capitals available to communities.\textsuperscript{ix} Matching capacities (i.e., capitals\textsuperscript{x}) with specific governance models could be crucial for effective Aboriginal inclusion in natural resource development.

1.2. Enhancing Aboriginal Capacity for Increased Control and Benefits from Natural Resources

The Royal Commission on Aboriginal People found that long-term systematic exclusions have created serious Aboriginal capacity gaps in education, skills training and experience needed to effectively pursue self-governance and development priorities in, for example, lands and resources.\textsuperscript{xi} The Commission identified that capacity building for self-governance and development also requires fostering competencies in research and development, technological innovation, and public service. This is reflected in forestry, for example, where overall Aboriginal involvement in actual decision making and higher ranked positions is proportionately less than that of non-Aboriginals.\textsuperscript{xii} The National Aboriginal Forestry Association’s Framework for Aboriginal Capacity Building in the Forest Sector states that Aboriginal people also tend to hold low-skilled, part-time and seasonal positions within the forest industry, even though more Aboriginals are hired.\textsuperscript{xiii}

Level of education may also be a factor. Statistics Canada data shows that the proportion of the Aboriginal population with a university degree was 7.7% in 2006, versus 23.4% among non-Aboriginals in Canada.\textsuperscript{xiv} The majority of Aboriginal post-secondary students are concentrated in education, social and behavioural sciences and business. However, training in areas such as finance, engineering, natural science, and computing, for example, is also needed to hold higher level management and leadership positions in Aboriginal government and business.\textsuperscript{xv} ‘Work readiness’ training programs provide another avenue for Aboriginal people build skills and confidence to gain employment in the resource sectors and at the same time enable companies to identify qualified entry-level workers.\textsuperscript{xvi} Aboriginal-mining company agreements have significantly boosted access to employment and training, and promoted the development of new Aboriginal businesses leading to economic development and autonomy.\textsuperscript{xvii}

Synthesizing current knowledge of Aboriginal capacity and how it is linked to various types of arrangements—from advisory committee involvement and regional planning to legally binding agreements and joint business ventures—highlight the impacts from the pursuit of natural resource development on Canada’s northern and resource-based communities. Increased understanding of the mechanisms that promote long-term, trust-based and benefit-oriented outcomes involving Aboriginal and non-Aboriginal peoples, governments, industry is a major outcome of this research. This report will therefore facilitate the ongoing promotion of development models that produce sustainable benefits.

2. Implications

Globally, natural resource extraction is taking place at an unprecedented rate, and this is expected to increase as many countries seek a higher standard of living in combination with rising populations.\textsuperscript{xviii} This will likely put new socio-economic incentives and pressures on communities and various industries to enhance production in resource rich areas, which in Canada often means Aboriginal lands that are frequently located in rural, remote and northern regions. Policy and decision makers within Aboriginal
and provincial governments who are primarily engaged in resource management processes will be further pressed to develop solutions.

This report illustrates the growing number of development projects related to energy, forestry and mining, which involve Aboriginal peoples, their lands, and natural resources. It also shows that research with and on Aboriginal communities involved in energy, forestry, and mining has increased over the past decade. Rich and diverse, the research reviewed here is highly illustrative of development and governance processes; however, given the nature of existing data, comparisons are problematic. There remains an opportunity, if deemed necessary and desirable by Aboriginal peoples, for intentional and coordinated research that can produce consistent, detailed, information regarding local and regional scale phenomena. Future decision making could be greatly enhanced by having access to reliable information on actual accrued benefits and capacity needs. Without this sort of information, policy and management decisions will continue to be characterized by a higher degree of uncertainty, and research will remain externally driven.

The types of governance systems that support sustainable development from an Aboriginal perspective are not fully understood and this remains a recent area of scholarship in the Canadian context. Report findings show that the suite of arrangements currently used to facilitate Aboriginal involvement is quite diverse and the capacities required by communities and Aboriginal governments vary. A mix of arrangements also frequently comes into play, due in part to historic contexts, legal and sectorial requirements, and the goals of communities and their partners. In a turbulent environment, while there is obviously a need for resource industries, Aboriginal groups and governments need to remain flexible and adaptive, highly complex settings call for collaboration and coordination. Cross-sectorial policy learning opportunities could be very instructive, especially where multiple industries, governments and communities are involved in multiple different projects within the same region(s).

Development that is culturally appropriate, environmentally responsible, and socio-economically beneficial is a major priority expressed and demanded by Aboriginal leaders, organizations and communities. In order for natural resource development to occur sustainably, and in meaningful partnership with Aboriginal communities, extractive activities must create tangible benefits for local people while also safeguarding ecosystems for future generations. However, recognition of Aboriginal rights alone is not enough for Aboriginal communities to access the benefits of natural resource development. This report illustrates the variety of capacities that Aboriginal peoples possess and the creative ways that capacities can be mobilized to build additional capacity for greater community benefit.

3. Research Approach to Knowledge Synthesis

3.1. Bibliometrics of Aboriginal Natural Resource Development Capacity

In our two-staged research design, bibliometrics were used to analyze existing literature in energy, forestry, and mining. Such approaches to research evaluation offer useful tools to survey trends in entire disciplines as well as thematic areas of research. A comprehensive search of research articles was undertaken using well-recognized and widely-utilized research databases, namely, ISI Web of Science
To do this we used a combination of search terms, including the names of major sectors, ‘Aboriginal’ and its various synonyms, Canadian provincial and territorial names, as well as the terms ‘control’, benefits’ and ‘capacity’. The search was also limited to 2004 onwards in keeping with our focus recent initiatives. This search turned up 196 papers (125 in Scopus and 71 in Web of Science). After removing duplicate papers, 144 documents remained. The protocol developed and followed to guide searches also included clear eligibility criteria for inclusion/exclusion and vetting procedures to focus our initial sample. Application of inclusion/exclusion criteria further reduced our sample to 49 papers.

We then gathered information based on established core metrics to produce a robust, high quality database. Metrics included the (i) year of publication, (ii) authorship and gender, (iii) author affiliation, (iv) journal titles, (v) citation counts and impacts factors, and (vi) keywords. This portion of the review provides a deep and thorough analysis of research trends, and enabled us to examine the current status of Aboriginal capacity research in energy, forestry, and mining.

3.2. Systematic Review of Aboriginal Capacity, Control and Benefits

The second stage of the research included a systematic review of 24 papers in relevant journals to assess actual outcomes of Aboriginal capacity building and its relationships to control and benefits. The 24 papers selected from the original bibliometrics sample included those that reported actual findings from particular local and regional cases. In particular, we excluded papers that did not have a research site and/or were purely conceptual, which ensured that our results were based examples of how capacity, control and benefits actualize in a real world context. This was done to narrow the research question in order to make the review feasible. Systematic reviews utilize a synthesis-based methodology for rigorously analyzing large amounts of existing research knowledge to create new information. While traditionally a quantitative methodology developed by and for medical disciplines, systemic reviews for qualitative social science research are now being usefully applied. Our approach to research synthesis used theme coding based on a coding framework. This framework was developed to assist classification and open coding of key statements regarding social, human, financial, built and natural capital, to identify forms of capacity and benefits. All 24 papers were reviewed to collect details on the types of natural resource development initiatives, their locations and the partners and stakeholders involved. Finally, we also looked for details on research methods (e.g., research design, data collection and analysis, participants and sampling). Findings are presented in the following sections.

4. Results

4.1. Research Bibliometrics: Aboriginal Capacity Building for Natural Resource Development

4.1.1. Year of Publication

A total of 49 papers from 2006 to 2015 were identified and analyzed to assess bibliometrics trends (Figure 1). Most papers were in the forest sector (20), followed by mining (19), and energy (9), with energy having half as much activity than the other sectors. Results show an increase in published research related to Aboriginal capacity building for natural resource development over the last decade.

Peak output years were 2013 and 2015 with 11 publications in each year. Conversely, 2011 had only one publication (forestry). While all sectors experienced growth in research output, this was concentrated in
mining and forestry. Mining clearly increased after 2012, exemplified by the fact that 13 of 19 total mining articles were published from 2013 to 2015.

The absence of forest-related publications in 2014 was followed by a peak in forestry publications in 2015 (6 in total); the larger number of forestry articles 2012 onward may be linked to the rebound of the Canadian forest sector and, in particular, the formation of several new collaborative governance and business arrangements involving Aboriginal groups, industry, and government. This expansion and diversification is part of a larger 30 year trend in Aboriginal forestry involvement that has produced an “almost bewildering variety of such arrangements.”

Figure 1. Numbers of Articles per Sector by Date of Publication.

4.1.2. Authorship and Gender

Of the 49 articles in the dataset, 19 were published by single authors and 30 were published by 2 or more authors (up to 5 authors) (Figure 2). The number of papers with 2 authors (16) was more than double that of the other three multi-author categories combined (14). Most (63%) Aboriginal capacity research that we reviewed was collaborative in nature. Proportionately, forestry displayed the highest level of collaboration with 15 out of 20 papers being multi-authored. Energy in particular, but also mining, was more balanced in the distribution of single versus multi-author papers (where single- to multi-author papers were 5:4 and 8:11. Our dataset included 90 individual authors, several of whom contributed to more than one paper over the past decade.

Of 90 total authors, 56 were male and 34 were female (Figure 3.1). Male authors led approximately one half (26/49) of the papers analysed (Figure 3.2). This distribution is consistent with other recent Canadian bibliometrics studies.
4.1.3. Author Affiliation

Author affiliation was used to analyze spatial and institutional trends in research output (see Figure 4 below). At first glance, research output appears concentrated in institutions in British Columbia, Manitoba and Ontario. However, combined contributions in, for example, Alberta, Saskatchewan, and the Maritimes, indicate that many regions are in fact active contributors to research. The top contributing universities are University of British Columbia, Simon Fraser University, University of Manitoba, and York University.

Several other organizations, such as natural resource consultants, non-government organizations and Aboriginal groups, also contributed to authorship, in many cases illustrated by contributions from places such as Inuvik; NT; Telkwa and Fort St. John, BC; Waskesui, SK; and, Heron Bay, ON. Notable absences among Canadian regions include the Yukon, Nunavut, Prince Edward Island and Nova Scotia. Inuvik is the only research contribution from northern Canada.

When researcher institution and research locations are compared, a clear pattern of division emerges (Figure 4). This distribution pattern indicates that at least with respect to the research sampled here, research capacity (and associated jobs and decisions) and output is focussed in southern and urban Canada, whereas the majority of projects under study are located in northern, rural and remote locations (see Appendix B for further site details). These findings reflect the now well documented dilemma of northern resource and traditional economies operate in the Canadian context. A small
number (6) of international researchers were engaged, indicating international interest and impact. Perhaps similar to the external multinational corporations whose capital, management skills and technical knowledge drive northern resource development, southern universities are key players in Aboriginal natural resource development research.

Figure 4. Research Sites and Location of Author Affiliated Institutions (compare with Appendix B).

4.1.4. Journal Titles

The papers sampled originated from 32 journals (27 reviewed, five non-reviewed). Out of the journals identified, 10 published two or more papers (Figure 5). Many of these journals were either interdisciplinary northern and natural resource journals (e.g., Society and Natural Resources) or else sector specific (e.g., Extractive Industries and Society). While journals such as Forestry Chronicle and Arctic published the most articles related to Aboriginal capacity building for natural resource development (four each), these papers were not necessarily the most impactful in terms of citations.
Nine of the 32 journals sampled were explicitly regional or national in scope (e.g., Canadian Mining Journal, Arctic), while 23 were more international (e.g., Studies in Political Economy). The range of journal titles selected by authors as outlets for their research indicates the variety of disciplines and audiences engaged in Aboriginal natural resource development and capacity research. It may be notable that only two of the 32 journals were focussed on Aboriginal issues, Études/Inuit/Studies and International Journal of Circumpolar Health, which perhaps raises questions about whether this research is reaching all relevant audiences.

Figure 5. Top 10 Journals by Research Output.

4.1.5. Citation Counts and Impact Factors

Several factors affect citation counts, such as journal profile, the number of co-authors, and author/journal reputation. Often cited papers and authors are also more likely to be cited in the future. Publication date and therefore circulation time can also increase citation counts. Three of the top ten cited papers were in journals with impact factors >2.0, while four were journals with impact factors between 1.0-1.9, and one <0.9 (also a regional journal) (Table 1). The remaining two papers were published in journals with no assigned impact factor, including the most cited paper, which appeared in Impact Assessment and Project Appraisal.

The top ten most cited papers fell between 2006 and 2012, confirming perhaps that length of circulation time boosts exposure. Of the top cited papers, six were reviews (which tend to draw attention) and four were research articles. Six papers were multi-authored, while 4 were single-authored; combined citation counts of 117 to 72 confirm the tendency for multi-authored papers to be cited more than single authored papers. Authors and funding agencies looking to boost the reach of research on Aboriginal capacity and natural resource development might consider a collaborative publishing strategy.
Table 1. Top 10 Most Cited Papers.

<table>
<thead>
<tr>
<th>Top 10 most cited articles</th>
<th>Impact Factor</th>
<th># cites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fidler, C. 2010. Increasing the Sustainability of a Resource Development: Aboriginal Engagement and Negotiated Agreements. <em>Environment, Development and Sustainability</em>, 12(2): 233-244.</td>
<td>0.00</td>
<td>16</td>
</tr>
</tbody>
</table>

*Figure 6. Range/Importance of Keywords (Top 30), Indicated by Size based on Frequency.*
4.1.6. Keywords

In total, 177 keywords were identified (Figure 6). Next to expected keywords, such as Aboriginal, Indigenous and First Nations, for example, the range of common research keywords illustrates the resource sectors (e.g., mining, forestry, renewable energy), regions (e.g., British Columbia, Nunavut, Boreal Forest) and governance engagements (EA, co-management) commonly linked to natural resource development and Aboriginal interests in Canada. The range of keywords mobilized to describe research focus over the past 10 years also shows the diversity of issues, projects and groups connected to Aboriginal capacity building and natural resource development work. The continuity of certain terms (e.g., boreal forest, partnerships, traditional knowledge) across all sectors indicates common issues arising in multiple sectors that warrant attention.

4.2. Systematic Review: Evidence of Aboriginal Control, Capacity Building and Benefits

4.2.1. The Nature of Aboriginal Natural Resource and Capacity Research

All of the 24 papers systematically reviewed used a case study method. Fifteen involved collecting primary data, whereas two drew on secondary data, and seven did not specify. Interviews, focus groups, participant observation of formal planning meetings, field notes, and workshops represent the main data collection methods. We found significant variation in the level of detail provided in papers that did describe methods. For example, 9 of 17 reported the actual number of people engaged in interviews, focus groups, and workshops. Depending on the study, interview numbers varied from as many as 63 to as few as 8 participants; some studies just listed the types or names of groups that were engaged, gave general ranges of participant counts, or did not specify at all. Sampling approaches and protocols also varied, and participants ranged from Aboriginals, government, industry, economic development organizations, EA staff, community leaders, school and health care staff, and Elders. This is appropriate given that context varies and some natural resource issues are quite cross-cutting. Inconsistency and transparency in research reporting are perhaps important limitations to be overcome, especially where comparisons might be helpful in the future. While contributing to the richness of this research, methodological and stylistic differences pose challenges to systemic assessment.

4.2.2. Asserting Control through Natural Resource Governance

We examined collaborative arrangements which Aboriginal communities and organizations use to assert control over resource development (see Appendix B for additional details). Not surprisingly, control over decision making processes and enterprises that affect lands and resources within traditional territories created chances to attain benefits. This is in keeping with current research on Aboriginal motivations for involvement in natural resource management and development. The research reviewed revealed nine categories of arrangements (see Figure 7). As discussed below, combining different types of arrangements and creative use of existing arrangements were two strategies employed to assert Aboriginal control in natural resource development.
Most notably were *land use strategies and planning processes*, which appeared in one-third of research papers. These were concentrated in forestry and, to a lesser degree, energy. These were typically supported by resource licenses granted to Aboriginal groups and their partners. In addition to obtaining management rights and responsibilities (e.g., conditions of holding a forest license), some First Nations have become recognized as central leaders in their region by mounting larger planning initiatives: “…the governance initiatives of the Pikangikum have placed the First Nation in a leading role in management processes concerning the Whitefeather Forest.” Some groups have used new found control and positional power in creative ways to influence decisions and priorities in other forums. For example, in the case of The Turning Point Initiative the “Haida were able to change the objectives of the BC government and challenge the harvest rates of the forestry industry through collaborative efforts.”

Whereas the Haida and Pikangikum have formally negotiating agreements with the province over a specified land area, the Prince Albert Model Forest is a collaborative entity intended to facilitate coordination of stakeholders and activities in a roughly defined region. A main objective is to enable Aboriginal involvement in the forest sector in general. The organization itself has no jurisdiction over natural resources, but many partners do (including Aboriginals). The ability to influence policy and projects thus lies in the collaborative network it supports and the commitment of partners to common initiatives. Strong Aboriginal involvement in the PAMF, whether measured board representation or collaborative project engagement, has long been viewed as a strength by the main funder (e.g., NRCAN) and other organizations.

Similarly, a self-supporting, non-profit company, Chuzghun Resources Corporation (CRC), manages the John Prince Research Forest (JPRF). Grainger and others discuss the importance of the delegation of authority to a local user organization in co-management arrangements, and potential direct implications for ecosystems and governance ‘style’. They found that

> Within limits, the CRC Board of Directors has autonomy over timber resources on the JPRF. The Board’s ability to manipulate forest cover and to develop access could have significant impacts on wildlife, fisheries, plants, water, and visual quality, which in turn could impact forest users. However, the autonomy of the partners is constrained by the tenure under which the JPRF is held. The JPRF is Crown land tenured to CRC; tenure
grants the right to use the land for a specific purpose, but also sets restrictions on land use, the management process, and user obligations. \(^{xxxviii}\)

Grainger and others conclude that while the JPRF’s tenure constrains to some extent their control over decision making, “a certain level of autonomy has allowed CRC to attempt to act innovatively, for example in using a consensus model, and by acknowledging traditional territorial governance (if in a limited fashion).” Thus, the ability to choose or design decision making processes (rather than just participating in them) indicates elevated control and capacity, and is a measure of participatory governance. \(^{xxix}\) Taken together, broad Aboriginal land use planning initiatives afford conventional levels of management control, but due to their all-encompassing nature they can also extend reach of influence to other forums as well as enable customization of local processes. Aboriginal people can thus make changes that better support their own involvement through collaboration.

*Impact and Benefit Agreements* were also discussed in one-third of papers, primarily related to mining. Research indicates that IBAs were often used in combination with other arrangements, which afforded additional control or avenues to exert influence. For example, Fidler (2010) examined a negotiated agreement (NA) between a mining company and the Tahltan Nation in BC and asserts that the Tahltan were able to increase their control over the environmental assessment decision-making process and were effective in changing the proposed project in keeping with the Tahltan vision, goals and knowledge:

> The Tahltan utilized the NA to influence the mine design by identifying an alternative access road and secured additional remedial requisites for the proponent to adhere to during decommissioning...The Tahltan used the NA to supplement the roles afforded to them by the regulatory authorities and incorporate outstanding concerns above and beyond those set out in the EIA. \(^{xli}\)

The third most cited arrangement was *Memorandum of Understanding* (25%), found in all major sectors. For example, Heisler and Markey discuss how Aboriginal mineral development in northwest British Columbia has been advanced through memorandums of understanding (MOU). The authors report on the case of the Office of the Wet’suwet’en, “a non-band, non-treaty traditional Aboriginal government organization, who negotiates [MOUs] with companies requesting access to their territories”. \(^{xlii}\) The Wet’suwet’en use MOUs to create and legitimize forums for meaningful dialogue regarding land use and resource development within their territories. MOUs in this case, serve as a flexible tool to facilitate initiation of the conversation and set the formal context for future resource development within their traditional lands. This is true of other settings as well; three cases showed how an MOU led to new business arrangements in forestry (2) and mining/energy (1).

*Aboriginal businesses and joint ventures* were used in forestry and energy to support business to business engagements. Krupa et al. analyse two renewable energy cases focusing on participation and multi-level governance, and highlight the importance of authority in decision-making processes. Based on their findings, they conclude that “truly sustainable renewable energy development requires a project design that reflects community values, incorporates community control, and incentivises indigenous ownership”. \(^{xliii}\) Private companies offer a high degree of autonomy and hasten operational decisions, and can return profits to Aboriginal ownership, whether individuals or bands.

*Environmental Assessments, revenue sharing agreements and advisory committees* provided formal arrangements through which decision making influence and resources could flow, these were often utilized alongside other arrangements. For example, the concomitant application of IBAs and MOUs in
mining (and the latter in forestry as well) indicates a variety of activities can be applied, and often simultaneously or at different times, throughout engagement and development processes. In two cases community energy plans led to actual community business/business partnerships. IBAs and EAs occurred at the same time in two mining cases. While land claims are not directly addressed in this report, it is important to note that in some regions they often precede or occur in conjunction with other initiatives and they can have implications for activities in all sectors.

One unique case was the formation of a *regional economic council* by a collection of Aboriginal communities in British Columbia, which was designed to facilitate international relationships. A council representing many Aboriginal groups was initiated to undertake high-level relationship building and consultation with international business partners wanting access to Aboriginal territories and resources. The process enabled Aboriginal decision makers to deal directly with foreign partners.

The above example is noteworthy in part because the majority of cases did not, in fact, have an explicitly international focus. Rather, the main scale of agreements and partnerships, based on stakeholder involvement in projects and the resources involved, was provincial or territorial (10 cases), followed by international (5 cases), and then national (2) (Figure 8). This seems intuitively correct given the provincial jurisdiction of most natural resources in Canada.

![Figure 8. Scale of Agreements by Parties Involved.](image)

Finally, with respect to control and having capacity for maintaining control, some see that there is a difference between holding a legitimate role in strategic-level decision making that is recognized by other governments in Canada, and having fully functioning Aboriginal governance processes and structures to actually enable natural resource development enterprise requiring operational decisions:

The first step is to be engaged in a government–government relationship with the province... [involving] some form of revenue sharing with the province, particularly around stumpage and mining... The second step is to develop effective governance arrangements that allow the businesses to succeed.\textsuperscript{xiv}

Taken together, the above governance arrangements illustrate the suite issues and conditions that Aboriginal communities and their partners must navigate in the pursuit of natural resource development. Indeed, recognition of rights is not enough for Aboriginal communities
to reap the benefits of natural resource development. Capacity to become involved, indicated by the presence and development of several forms of capital, is essential. In the next section, we discuss the many forms of Aboriginal capacity that are needed to become meaningfully involved in different natural resource development opportunities.

4.2.3. Aboriginal Capacity in Action: A Five Capitals Perspective

Ten of the 24 articles analysed explicitly referred to capacity building achievements. Below we highlight what we found regarding Aboriginal capacity as it relates to resource development initiatives documented over the past decade. Evidence is examined through a capitals-based approach. We consider five main types of capitals to structure our analysis (i.e., social, human, financial, built and natural). Each capital is very briefly defined below and elaborated with evidence from prominent cases to show how capacity was applied or enhanced to facilitate collaborative development.

a) Social Capital

Social capital relates to the social resources, including networks, social relations, collective norms, and relationships of trust and reciprocity, upon which people draw when pursuing different livelihood strategies requiring co-ordinated actions. A basic application of capacity for collaboration, cross-cultural dialogue was discussed in four of the ten articles as an important capacity to be developed for the benefit of Indigenous communities. For example, Bowie concludes that “commitments to cross-cultural dialogue and Indigenous control over Indigenous knowledge lead to better integration with scientific management approaches” related to the Whitefeather Forest Initiative and Pikangikum First Nation. Cross-cultural dialogue has been linked to promote better, more respectful relationships and generate trust between partners in resource development.

To this point, based on their analysis of the Prince Albert Model Forest, Hvenegaard and colleagues assert “it was important to develop processes that allowed partnerships to remain open, transparent, collaborative, and inclusive. This generated an atmosphere of trust and commitment for all partners.” Grainger and others also discuss how the structure and membership of the board of directors at the John Prince Research Forest Initiative has given particular care to “creating an atmosphere that promotes cross-cultural understanding and respect.”

Fidler explains that “an effective bi-lateral relationship between industry and an Aboriginal group is crucial for building trust, respect and long term certainty”, but falls short in providing more details about what an effective bilateral relationship would look like in this case. Nonetheless, a good rapport can be pre-existing or fostered through collaboration, but it is essential to advancing natural resource development in cross-cultural settings.

The role of champions in the community is crucial to engaging the local community towards increasing social capital. Krupa and colleagues explain how existing human capital (leadership) can be mobilized to build social capital:

Pic River has used ‘community entrepreneurs’ or champions: that is, individuals with a strong interest in seeing the project through to fruition. In-house leadership has been crucial, as the project has been internalised as part of the community’s long-term development trajectory. No longer is it the exclusive purview of an external entity; instead, renewable energy has acted as a sustainable development tool that complements spiritual, cultural, and social goals.
Grainger and others further discuss how having a neutral facilitator is essential to “advance the working relationship between partners and other stakeholders.” In their research on the John Prince Research Forest initiative, they contend that the board of directors is a diverse group in terms of culture, education, work and life experience, and socio-economic factors. Group dynamics have generally tended toward cordial politeness and mutual respect. An external facilitator has been engaged on a few occasions. Frequently the Forest Manager assumes facilitation functions. iv

Many different public-private-civic partners engage with Aboriginal groups to undertake natural resource development projects (Figure 9). As discussed above, the presence of trust among partners, but also the network of partners itself, provide evidence of social capital needed to carry out projects. Based on our systematic analysis, most papers identified Aboriginal communities, along with provincial and territorial governments and private business partners as most prevalent. However, collaboration can involve non-government groups, research institutions, and other groups, depending on the nature of each arrangement. The number and variety of partners identified in current research indicates just how many parties Aboriginal communities and their governments engage to advance their land management objectives. Discussed below, the wide range of partners also augments human capital, as different partners and individuals are sure to possess, and have access to, different capacities.

Figure 9. Primary Partners in Aboriginal Natural Resource Development Initiatives.

b) Human Capital

Human capital involves the skills, education, knowledge and ability of labour, physical ability and health, and individual attributes that are important for the successful pursuit of different livelihood strategies. lv Typically an outcome and therefore benefit of resource development projects, the importance of preparatory training was discussed in four of the ten articles that focus on capacity issues. Bowie
describes the emergence of the Turning Point Initiative led by the Haida in British Columbia, and how an external organization (i.e., David Suzuki Foundation) was supportive “in developing and implementing capacity building strategies, including training and certification of community-based forestry and fishing fieldworkers” \textsuperscript{lvii}. Similarly, in their research into diamond mining in the Northwest Territories, Davison and Hawe show how individual and community capacity can be enhanced through training and educational programs to facilitate development opportunities. They explain that

> In the summer of 2005, a regional trades and technology training centre was established to facilitate modular courses that would train local people in essential job-related skills, particularly those applicable in the mining industry. The program was funded partially by a Mining Skills Development Strategy grant from the federal government and partially through a large donation from local diamond mines. \textsuperscript{lviii}

Interestingly, Davison and Hawe also note that human capital (e.g., job-related skills) in Indigenous communities can have longer term positive impacts, since the new learned skills can be transferred to other local developments or to new projects in others regions, where work schedules (e.g., bi-weekly rotation) and commuting infrastructure permit. However, as Fidler points out there can be a need for upfront investments in funding and employment training, and therefore initial financial capital investments to open up opportunities with Aboriginal communities. \textsuperscript{lix}

Self-governing and decision-making capacity was also discussed as an important human capital to be developed for increased control and benefits from natural resource development. \textsuperscript{lx} In some cases structures and processes exist or can be established to channel human capital:

> Their self-governing capacities were enhanced by the establishment of the Haida Land Use Vision, which was critical to articulating Haida values and goals and utilizing their vision in management processes. \textsuperscript{lx}

The need for coordinating structures to mobilize and develop human capital extended to research capacity as well:

> Elders want to have collaborative or joint research, which implies shared decision making regarding research design, objectives, and outputs, such as intellectual property, NTFPs, and/or research publications. Collaborative and joint research would require committed, long-term partnerships with the Pikangikum community, the WFMC, and the WFESG. \textsuperscript{lxii}

The ability to envision and carry out such efforts to coordinate and mobilize community capacity shows how human capital can be applied by some Aboriginal communities to pursue natural resource development and governance goals.

c) Financial Capital

Financial capital involves the financial resources (cash, credit/debt, savings, and other economic assets) that are available to individuals and communities and that are essential for the pursuit of any livelihood strategy. \textsuperscript{lxiii} It is no secret that many Indigenous communities struggle in this regard. The capacity for Indigenous communities to engage in resource development opportunities is often constrained by many issues, such as funding and more immediate community needs. \textsuperscript{lxiv} Financial capital is therefore an essential aspect when trying to build/develop overall capacity to increase Indigenous control over and benefits from resource development.
Fidler provides a good example about how monetary resources, provided through a negotiated agreement, facilitated increased control over and benefits from a proposed development:

The Tahltan were able to utilize monetary resources provided by the proponent through the NA to become more engaged and positively influence the design and planning of the mine. For instance, the proponent proposed two possible access routes to the proposed open pit site for government agency and Tahltan Nation review. The Tahltan analyzed engineering plans and company rationale, held discussions in the community, and through participatory engagement that included the incorporation of [Traditional Knowledge], were able to identify a third and final route (approved in the EIA certificate) which posed less risk to the Nation.\textsuperscript{lxv}

Hvenegaard also discusses funding in relation to the Prince Albert Model Forest, describing all the changes the collaboration has endured since its inception. These authors remark on the ability of the organization to continually leverage cash and in-kind support from a variety of partners.\textsuperscript{lxvi} Other collaborative organizations, such as the John Prince Research Forest, a co-managed forest between Tl’azt’en Nation and the University of Northern British Columbia, combined joint grant writing initiatives with funding from its log sales to support the collaboration. The utilization of self-generated revenue and collaborative process of proposal writing in turn builds social capital by engaging partnerships and creating a sense of independence.\textsuperscript{lxvii}

d) Built Capital

Built capital was not discussed as a capacity item needed to attract business but rather as a net gain or outcome of development. Built capital is therefore discussed below under benefits.

e) Natural Capital

Natural capital involves the natural resource stocks (soil, water, air, genetic resources, etc.) and environmental services (hydrological cycle, pollution sinks, etc.) from which resource flows and services useful for livelihoods are derived.\textsuperscript{lxviii} Alongside built capital, natural capital was one of the least discussed aspects of capacity building. The lack of discussion regarding natural capital as a facilitating capacity for Aboriginal involvement could be due to the fact that projects are happening because natural capital obviously already exists and so natural capital is taken for granted as a pre-condition for development.

Actions to sustain the productivity of the land such as environmental remediation and monitoring contribute to natural capital stocks; however, these are more appropriately discussed in the next section as beneficial outcomes of Aboriginal natural resource development.

4.2.4. Aboriginal Benefits from Natural Resource Development

Nearly all (22) papers in the systematic review gave examples of actual benefits associated with Aboriginal natural resource development initiatives. Definitions and data varied significantly, making it very difficult to quantify and compare benefits across cases and sectors. Nonetheless, we found benefits in each of the five capital areas, the majority of which were forms of human capital (Figure 10). Employment (50%), improved decision making (46%), financial support (33%) were the top cited benefits. The overall range of benefits was roughly proportionate to the sample of papers, with forestry and mining having approximately double the benefits held by energy in terms of total benefit categories
(11, 12, 7 respectively) and number of papers per category (27, 27, 12, respectively). Benefits are discussed below using the five capitals framework.

Figure 10. Range of Benefits from Aboriginal Natural Resource Development Across Sectors.

4.2.5. Evidence of Benefits: Capital Enhancement

a. Social Capital

Collaborative natural resource development improved non-Aboriginal relations. Trust building and collegiality were fostered by creating inclusive environments that respected transparency and equality and that incorporated shared responsibility and contributions, in the true sense of partnerships. Whereas partnerships can vary in level of formality, powers sharing, and partner representation, all cases reviewed illustrated how partnerships are also both structures and processes for working together, and therefore evolve over time. The number and variation in agreements involved in any one case (as discussed above in section 4.2.2), whether in energy, forestry or mining, provides direct evidence of this reality.

For Aboriginal people, the shared sense of pride associated with development processes and new realization of improved self-reliance was a positive outcome with a reinforcing effect on the culture of work. Four studies noted improvements in attitudes of work, where management structures with a high degree of Aboriginal ownership and control in turn fostered a sense of responsibility, duty, accountability and optimism. Net gains in social capital illustrate that meaningful involvement in natural resource development builds links among adults, who in turn model positive behaviour for youth as well.
b. Human Capital

As mentioned above, enabling Aboriginal leadership for improved decision making was an important form of human capital to be mobilised by natural resource development initiatives. Recognition of rights and increased influence in decision making supported Aboriginal people to apply their own judgement to, for example, guide forest planning, approve or critique EAs, relay personal impacts with potential implications for human capital, and to vet collaborative research outputs. They could also help provide leadership in business to guide development of relationships with international partners or local companies to support emerging business opportunities. In these ways, better representation in existing and new processes is a human capital asset.

Related to improving environmental resource decision making, the application of Traditional Knowledge was raised as a benefit of joint initiatives. Incorporation of indigenous approaches to resource use and conservation would produce more complete understanding of management issues and strengthen processes. Likewise, the ability to gain access to new expertise and information by partnering with non-Aboriginals was of benefit to Aboriginal groups. The array of projects reviewed produced a broad collection of specialized information including resource inventories, biophysical data, and traditional land uses, as well as expertise in, for example, geographic information systems, which was relevant to Aboriginal partners.

Provision of training and education was cited as a benefit in 25% of papers in our sample. Once again there were no reliable numbers on Aboriginal training or education opportunities. However, research Aboriginal people gained access to both formal and on the job training opportunities, as well as professional development. Especially in more traditional economies, new projects created awareness and opportunities for informal learning as people learned about natural resource politics and economic issues through exposure to sectoral activities. Pengelly and Davidson-Hunt further assert

Even though Pikangikum has a strong expectation of financial benefits such as joint ownership of financial benefits and ownership of products and/or novel knowledge, it is important to note that they equally seek non-financial benefits such as cross-cultural learning opportunities for community Elders and members.

Related to training and education were the many services and programs that contributed to human capacity to manage the land. Examples from the mining sector include career days, public talks, facility tours, and cultural heritage management planning, in forestry, collaboration supported reinvestment in research and public education. Enhanced programming and services are the corollary of natural resource development, either in cases where programs and services are required as part of agreements or complementary to mainstream ones.

c. Financial Capital

Over 70% (17) of papers discussed beneficial financial outcomes. One-third of papers discussed the importance of financial support (Figure 10), which comes in various forms but can be explained as sources of income that 1) derive from resource extraction and 2) that which is provided by government or industry to support Aboriginal involvement and collaboration, either before or during a development project. Natural resource-based income includes direct compensation and royalties from industry for resource taking, and revenues from the sale of resource-based products and services. Government and industry also provide funding to support Aboriginal involvement in processes such as Environmental
Assessments and forest management planning, or to support other community programs and services. Access to government loans was important to help Aboriginal and collaborative businesses get started.

Spinoff economic activities associated with new developments were seen to help recirculate benefits in the region of project origin. Spinoffs involve new opportunities made possible to entrepreneurs and local businesses, which improve the economic base, mainly by servicing major industry through contracting opportunities (e.g., silviculture and harvesting contracts in forestry). Few details were provided regarding the extent of spinoffs.

Not surprisingly, an important income source was employment, which was the most commonly mentioned theme. However, just three of 11 papers actually listed job numbers. From those research papers reporting job numbers, it was only possible to identify 222 new local jobs, with higher estimates reaching 500. It is largely impossible to substantiate broad claims of job creation with existing research on capacity, control and benefits, let alone accurately count jobs by sector, position, and demographics such gender, age, for example. Nonetheless, the desire for employment opportunities that would not cause fundamental change to culture and environment emerged as a common theme in mining and forestry suggesting that certain other values place attenuation on economic values. As Wyatt and others remind us, it remains a question whether the types and degree of benefits that are produced are always the ones wanted and needed by Aboriginal people.

d. Built Capital

Infrastructure was explicitly discussed in the mining and energy sectors (see Figure 10), specifically transportation, followed by other service infrastructure. Built capital included mainly that needed to support the mining industry, but that also was a benefit to communities. All-weather roads and improved water access facilities (i.e., barge docking) were cited as important to remote industries and communities. Permanent buildings, waste and water treatment facilities and hydroelectric generation were also cited.

e. Natural Capital

The most cited natural capital benefits were actions to sustain the productivity of the land such as environmental remediation and monitoring. The ability to manage the environment more carefully enabled through greater control and application of Indigenous land values, reduction of emissions with switch to cleaner and local energy sources, and proper waste disposal. Hvenegaard and colleagues, highlight how the Prince Albert Model Forest contributed to improving natural capital through the development of criteria and indicators, and monitoring of these important components:

The partnership was able to develop criteria and indicators to evaluate achievement of SFM goals. For example, most indicators regarding forests (i.e., forest birds, wildlife diversity, plains bison population, and fire frequency) appear good, but there are still forest-related concerns regarding forest fuel reduction near the park, prescribed burning, and the impacts of forest activities near the park.

Maintaining the land, and furthering human ability to so, is one important outcome of collaboration with Aboriginal communities.
5. Research Gaps and Needs

It is important to identify research gaps as this often provides context for others looking to expand upon previous work and generate leading edge and socially relevant research. Audiences including researchers, decision makers, Aboriginal peoples, and industry might consider the research gaps presented here and initiate new studies in order to address information needs. Our knowledge synthesis approach revealed some key unanswered questions and knowledge gaps, detailed below.

- Without monitoring and systematically collected data on capacity and benefits it is very hard to substantiate claims made in previous research. Current evidence is inconclusive and does not provide a clear and complete portrait of the actual state of Aboriginal capacity for natural resource development. Existing studies are rich and diverse, offering nuanced insights on current arrangements. While difficult logistically and perhaps legally impossible in some cases (e.g., IBAs), site by site collection of capacity and benefits data would be helpful to gain a better understanding regarding the relationship between Aboriginal capacity, control and benefits and how these are enabled through various governance arrangements. Arguably, a targeted call for research that focuses on characterizing the relationship between Aboriginal peoples, natural resource development and various benefits and associated arrangements would be valuable. Aboriginal peoples could lead this call along with their partners in government and industry to ensure core measures are adopted.

- The current challenge of information is likely related to the nature of research and scholarship in the social sciences and humanities. We found that research methods varied substantially, making it difficult to systematically assess capacity beyond general trends. Based on existing research surveyed here, it is impossible to accurately quantify the benefits accrued through Aboriginal collaboration in natural resource development, such as employment, revenue, infrastructure investments, cultural enhancements, for example. Case studies provide rich analysis and help us to understand the relationships among factors involved in development processes; however, they point to the need and opportunity for research designs (and resources) that can produce broad comparisons within and across sectors and regions. This would help identify recurring needs as well as prioritize policy actions according to current experience and future scenarios.

- Aboriginal capacity and natural resource development research does not shed much light on the current demographic characteristics of communities linked to rapidly evolving natural resource development arrangements. Analysis of census data, where possible, to assess changes in socio-economic profiles that could help to indicate capacity potential and changes. In addition to employment and training data needs outlined above, additional demographic information on education levels and training, gender, age, household incomes, for instance, would help decision makers, analysts and communities to better understand impacts from the global pursuit of natural resources.

- Our attempt to map research sites and outputs indicates a clear geographical separation of research capacity and research sites. On the other hand this illustrates the links between north and south and application of research capabilities and resources to northern issues which have not only local
but national and international implications. Still, the striking spatial disparity warrants further attention. Our research suggests that there is a need for in-depth examination of research capacity and disparities between north and south, rural and urban, and other domains, to assess implications for Aboriginal capacity development in general, but specifically in research. Examining the extent of university-community collaboration, sectorial collaboration, the sharing of research resources and findings with communities, local capacity for research, and researcher, student and community experiences with research all could provide useful insights to better understand the role of research in Aboriginal capacity for natural resource development.

- There is a need to fully examine the interplay of institutional arrangements utilized to structure Aboriginal natural resource development. Our synthesis illustrates the complexity of arrangements in some settings, which can be precipitated by the over layering of jurisdicitional, sectorial and traditional institutions that shape Aboriginal-settler interactions. For example, in instances where there is more than one agreement at work, it would be interesting to examine whether there are patterns of conditions of events that led to collaboration over time. In other words, are there certain constellations of agreements that tend to come into play together and does sector matter?

- Perhaps a limitation of this research, though intentional by design, is the exclusion of other primary natural resource sectors from this review. Other sectors, such as fisheries, agriculture, and freshwater could be characterized by similar and unique capacity needs, benefits, and levels of control. In some regions of Canada these sectors provide important economic and traditional roles in the lives of Aboriginal peoples. Larger questions of food and water security are immediately tied to these sectors. It could be useful to characterize the sorts of capacities required by Aboriginal peoples and their partners to sustainably manage and benefit from these other natural resources. Doing so would make it possible to draw comparisons with the sectors we examine in this report and support the need for integration in natural resource management and planning.

- To overcome some of the above identified challenges, perhaps governments and industries need to have a ‘clearing house’ guided by a common framework for how benefits for Aboriginal communities are assessed in order to enable systematic data collection, assessment and comparison of projects across space and time. Natural resource development revenues could support this initiative.

Addressing these gaps would help better inform decision making regarding Aboriginal capacity building achievements for sustainable natural resource development in Canada.

6. Knowledge Mobilization

Effective knowledge mobilization ensures a multifaceted flow of information between and among researchers, research users and other knowledge brokers, creating synergies within and beyond academia, which ultimately leads to positive impacts for society. Specific knowledge mobilization strategies include synthesis, dissemination, transfer, exchange and co-creation of knowledge through various partnerships.\textsuperscript{\textit{xxxvii}}
Our findings regarding Aboriginal capacity building in the energy, forestry and mining sectors should be broadly shared and we have a strategy to achieve this dissemination objective. Our research, in and of itself, synthesizes existing knowledge regarding promising arrangements that support Aboriginal capacity building and the enhancement of benefits and control, which sets the context for our dissemination plan.

At the onset of this research, we engaged Aboriginal and non-Aboriginal partners working in various natural resources sectors, and invited them to participate in this project. We will continue to expand this group of partners and potential knowledge users allowing continued transfer, exchange and ongoing co-creation of knowledge based on these initial findings. Our targeted research users include:

- Aboriginal communities, their economic development officers, and potential beneficiaries from projects that may occur within Indigenous territories;
- organizations that support Aboriginal business development and training;
- natural resource managers and policymakers working within Provincial and Federal governments;
- industry associations and business leaders engaged in natural resource projects that may affect Aboriginal peoples and lands;
- consulting groups that support various industries as they develop projects in partnership with communities and other partners;
- non-governmental organizations that support Aboriginal peoples and/or conduct natural resource development studies, and;
- Academics working at the intersection of Aboriginal, natural resource development, and governance issues.

Our project partners will be sent a version of this report and asked to provide feedback on its findings and associated interpretations. We will also request information regarding the types of customized knowledge outputs that might be most useful for uptake and utilization within these and related organizations. Since we want this research to be relevant to diverse users, we are preparing a research ‘briefing note’ comprised of key findings that can be distributed and easily understood by various users.

In addition to this final knowledge synthesis report and brief, we will be developing a peer-reviewed publication for submission to a high impact open access journal. Academic presentations will be given to communicate this research via conventional scholarly formats. This includes an upcoming talk at the Canadian Association of Geographers annual general meeting in June 2016 as part of a special session on the State of Rural Canada, (organized by the Canadian Rural Revitalization Foundation). If funds allow, an “E-lecture” will be given via the Canadian Institute of Forestry (CIF) to connect with upwards of 2400 professionals, students and citizens; we will look for similar audiences and venues in both the mining and energy sectors. Presentation slides will be given to partner groups so that they can share findings with their membership and further promote the outcomes of this SSHRC research synthesis project. We will also host a report launch at The University of Winnipeg and make the report and brief available to the audience and members of local media.

Increasingly, knowledge users are turning to digital resources for understanding pertinent issues facing society, such as social networking sites and multi-media outputs such as documentary films. As part of our knowledge mobilization strategy, we plan to develop a “video abstract” of the major outcomes of the research, which will feature team members discussing the findings set to visuals of the natural resource sectors explored. To date, video is largely an under-used form of scholarship and mode of presentation, yet it is a highly effective tool for communicating results for a range of knowledge
In this video, we will visualize data through simple yet effective animations, which will be designed to engage policy makers, business leaders, Aboriginal groups and others who need research data in an accessible and impactful format. The video will be shared via social media – such as Facebook, YouTube, and Twitter – as part of a marketing strategy that promotes the piece within communities of interest. We anticipate this video will be an important tool in all future project communications and will demonstrate an integrated approach to knowledge synthesis and mobilization.

To facilitate knowledge dissemination across the country and to an appropriate range of users, we intend to have results available into both official languages (i.e., French and English). Video-based reporting of major findings is particularly important as this enhances engagement, especially for busy managers and business leaders as well as communities that have a history rooted in oral culture. These considerations are explicitly designed to respect various types of knowledge users and increase the accessibility and impact of the research overall.
7. References


xii Royal Commission on Aboriginal Peoples. 1996. People to people, nation to nation: Highlights from the report of the Royal Commission on Aboriginal Peoples. Minister of Supply and Services, Ottawa, ON.


xvi Bombay, H. 2010.


xxiv Berrang-Ford et al. 2015.

Bowie 2013: 111
Davison & Hawe, 2012: 221
Fidler 2010
Nikolais and Nelson
Bowie, 2013: 113
Davison-Hunt et al, 2013: 6
Bennett et al, 2012.
Krupa. 2012.
Fidler, 2010: 240.
Hvenegaard, 2015: 54.
Bennett et al, 2012.
Grainger et al 2006.
Wyatt et al. 2013.
Montison. 2015.
Wyatt et al. 2013.
Davidson and Hawe. 2012.
Davidson and Hawe. 2012.
Fidler. 2012.
Grainger et al 2006
Hvenegaard et al. 2015.
Wyatt et al. 2015: 637.
Scales. 2010.
Van Schie and Haider. 2015.
Taylor. 2009.
Fidler. 2010.
Hvenegaard et al. 2015: 58.
8. Appendices

Appendix A. Bibliometric and Systematic Review List


## Appendix B. Research Sites

<table>
<thead>
<tr>
<th>Project</th>
<th># of papers</th>
<th>Province/Territory</th>
<th>Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whitefeather Forest Initiative</td>
<td>3</td>
<td>Ontario</td>
<td>Forestry</td>
</tr>
<tr>
<td>Turning Point Initiative</td>
<td>1</td>
<td>British Columbia</td>
<td>Energy</td>
</tr>
<tr>
<td>Diavik, Ekati, and Snap Lake Mines</td>
<td>2</td>
<td>Northwest Territories</td>
<td>Mining</td>
</tr>
<tr>
<td>Galore Creek Mine</td>
<td>1</td>
<td>British Columbia</td>
<td>Mining</td>
</tr>
<tr>
<td>John Prince Research Forest</td>
<td>1</td>
<td>British Columbia</td>
<td>Forestry</td>
</tr>
<tr>
<td>Prince Albert Model Forest</td>
<td>1</td>
<td>Saskatchewan</td>
<td>Forestry</td>
</tr>
<tr>
<td>Giant Mine Remediation Plan</td>
<td>1</td>
<td>Northwest Territories</td>
<td>Mining</td>
</tr>
<tr>
<td>Pic River Hydro: Wawatay, Twin Falls, Umbata Falls Hydro projects</td>
<td>1</td>
<td>Ontario</td>
<td>Energy</td>
</tr>
<tr>
<td>NaiKun offshore wind farm</td>
<td>1</td>
<td>British Columbia</td>
<td>Energy</td>
</tr>
<tr>
<td>Meadowbank Gold Mine</td>
<td>2</td>
<td>Nunavut</td>
<td>Mining</td>
</tr>
<tr>
<td>Voisey’s Bay Mine</td>
<td>1</td>
<td>Newfoundland and Labrador</td>
<td>Mining</td>
</tr>
<tr>
<td>EcoTourism and Sustainable Forestry</td>
<td>1</td>
<td>Quebec</td>
<td>Forestry</td>
</tr>
<tr>
<td>Atlin Hydro Projects</td>
<td>1</td>
<td>British Columbia</td>
<td>Energy</td>
</tr>
<tr>
<td>MacKenzie Gas Project</td>
<td>1</td>
<td>Northwest Territories</td>
<td>Energy</td>
</tr>
<tr>
<td>First Nation Timber Harvesting Agreements</td>
<td>1</td>
<td>New Brunswick</td>
<td>Forestry</td>
</tr>
<tr>
<td>No Specific Project</td>
<td>6</td>
<td></td>
<td>Mining, Forestry, Mining and Energy</td>
</tr>
</tbody>
</table>