INDIGENOUS COMMUNITIES SUSTAINABLE DEVELOPMENT FRAMEWORK
FOR LNG DEVELOPMENTS IN NORTHWEST B.C.

by

Debra Mary Stokes

B.Sc., The University of British Columbia, 1996

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

in

The Faculty of Graduate and Postdoctoral Studies
(Mining Engineering)

THE UNIVERSITY OF BRITISH COLUMBIA
(Vancouver)

October 2017

© Debra Mary Stokes, 2017
Abstract

The extractives sector has the obligation to contribute to sustainable development in areas where resource exploitation occurs. Fulfilling this expectation is challenging in resource-dependent towns, that are periodically exposed to boom-bust dynamics. In northwest British Columbia, several large Liquefied Natural Gas (LNG) terminal projects have been proposed, involving high capital costs and several thousand workers for the construction phase. Indigenous Peoples are often negatively affected by such large developments, as their culture and sustenance is tied to the land and water. Many of these peoples are also unable to benefit from such developments, due to a lack of support mechanisms and the necessary training or education required for good paying jobs. This study investigates how large resource developments can contribute to sustainability in B.C. First Nations communities by finding ways to enhance benefits and minimize impacts from boom-bust dynamics. Two socio-economic surveys were conducted with the Kitsumkalum First Nation, which is one of the Tsimshian Tribes potentially affected by LNG developments. Additionally, 31 interviews were conducted with LNG, mining, government, economic development and First Nations representatives, from which common themes were identified and ranked. Results showed that although high school graduation rates (16% to 34%), university education rates (4.5% to 7.3%), and unemployment rates, (29.2% to 17.2%) have improved for on-reserve Kitsumkalum members between 2006 and 2016, many continue to struggle economically. Education, training and employment (ETE) was collectively ranked by all interviewed sectors as the most important for First Nations to move towards a sustainable future, while all sectors individually ranked ETE as No. 1, except for First Nations, who ranked the removal of social barriers as No. 1 and ETE as No. 2. The need for good governance to roadmap effective changes was ranked No. 2, while the need to remove social barriers was ranked No. 3 by all sectors. In light of these results, a new framework was proposed, which incorporates the need for community characterization, a strategic sustainable development plan, good governance, and improved shared decision making and partnerships, in order to better facilitate sustainable development of Indigenous communities within the context of large-scale resource developments.
Lay Summary

The intent of the research was to investigate ways in which benefits from liquefied natural gas (LNG) developments in northwest B.C. could be leveraged, so that First Nations communities can move toward a more sustainable future. This is original research, as potential impacts and positive benefits associated with LNG projects have not yet been studied at the local level using a multifaceted approach. While impacts from industrial developments are inevitable, mitigation can minimize negative effects to an acceptable level, while benefits can result in an improved management regime for implementation of shared decision making and creation of valuable partnerships, bringing about greater certainty for both industry and First Nations communities. Results showed that with improved governance by First Nations, resource companies and the Federal/Provincial governments, combined with identifying challenges and opportunities specific to First Nations, plans can be developed to progress towards a more sustainable future for First Nations communities.
Preface

The dissertation is the original, unpublished work of the author, Debra Mary Stokes. The research question, methodology, analyses and interpretations are the original work of the author.

Original maps were created using Geographic Information Systems (GIS) software by Magellan Digital Mapping, Terrace, B.C., under the direction of the author.

The U.B.C. Research Ethics Board (H14-02530) issued a Certificate of Approval with Minimum Risk as the study had met all ethics approval conditions.
Table of Contents

Abstract ................................................................................................................ ii
Lay Summary ....................................................................................................... iii
Preface ............................................................................................................... iv
Table of Contents ............................................................................................. v
List of Tables .................................................................................................... ix
List of Figures ................................................................................................... x
Lists of Abbreviations ....................................................................................... xi
Acknowledgements .......................................................................................... xiii
Dedication .......................................................................................................... xiv

1 INTRODUCTION ............................................................................................ 1
  1.1 Statement of the Problem ....................................................................... 1
  1.2 Purpose and Hypothesis ...................................................................... 3
  1.3 Justification of the Dissertation ........................................................... 4
  1.4 Research Objectives .......................................................................... 5
  1.5 Research Questions .......................................................................... 6
  1.6 Applied Contribution of Research ....................................................... 6
  1.7 Academic Contribution of Research ................................................... 7
  1.8 Thesis Structure ................................................................................ 7

2 LITERATURE REVIEW .................................................................................. 9
  2.1 LNG and its Potential Benefits and Impacts ...................................... 9
    2.1.1 The Natural Gas Industry ............................................................. 9
    2.1.2 Social and Economic Effects from LNG Terminals .................. 11
    2.1.3 Environmental Effects from LNG Terminals ........................... 11
    2.1.4 The Non-renewable Extractives Industry and Boom-Bust Dynamics. 20
2.1.5 Scale and Potential Cumulative Effects of Boom-Bust Dynamics ..... 25
2.2 Aboriginal Peoples and Potential Benefits and Impacts from LNG ....... 26
  2.2.1 Indigenous Colonization in Canada and Historical Context .......... 26
  2.2.2 Socio-economic Conditions of Aboriginal Peoples in Canada ........ 29
  2.2.3 Indigenous Communities and Resource Development .................. 30
  2.2.4 Potential Impacts to Traditional Foods and Use Areas ................ 31
  2.2.5 What can the Extractives Industries offer First Nations? .......... 32
2.3 Governance ...................................................................................... 33
  2.3.1 First Nations Governance ............................................................... 33
  2.3.2 Corporate Governance ................................................................. 41
  2.3.3 Federal and Provincial Governance .............................................. 41
  2.3.4 Collaborative Governance ............................................................. 43
2.4 Sustainable Development .................................................................. 46
3 RESEARCH PROCESS AND METHODOLOGY .................................. 54
  3.1 Study Area ...................................................................................... 54
    3.1.1 Tsimshian and Haisla Nations History in the Region ................. 56
    3.1.2 European Settlement and Industrial Development in the Region ... 56
    3.1.3 Socio-economic Conditions of the Kitsumkalum First Nation .... 60
  3.2 Sampling Methods .......................................................................... 67
  3.3 Methodology .................................................................................. 69
    3.3.1 Survey Questionnaires ............................................................... 69
    3.3.2 Key Informant Interviews .......................................................... 71
  3.4 Data Analysis ................................................................................ 72
4 RESULTS AND DISCUSSION ........................................................... 74
  4.1 Education, Training and Employment ............................................. 75
List of Tables

Table 1. Workforce numbers for mining and LNG projects in northern B.C.................. 23
Table 2. Description of Canadian Federal Indian and Enfranchise Acts/Amendments . 27
Table 3. Low-income measures threshold for Canadian households for 2010............ 30
Table 4. The ICMM 10 Principles for Sustainable Development. .......................... 50
Table 5. Seven Questions to Sustainability ......................................................... 53
Table 6. Census population data of Status First Nations in the northern B.C.......... 63
Table 7. Common Themes identified by five sectors interviewed............................ 75
Table 8. Common Subthemes for ETE Theme ................................................... 76
Table 9. Kitsumkalum highest level of education on and off-reserve. ..................... 78
Table 10. Kitsumkalum employment status on and off-reserve.............................. 82
Table 11. Common Subthemes for Governance Theme ...................................... 106
Table 12. Common Subthemes for Social Issues/Barriers Theme............................ 117
Table 13. Common Subthemes for Supports Needed Theme.................................. 130
Table 14. Common Subthemes for Environmental Theme .................................... 140
Table 15. Key Academic and Applied Contributions from Research ..................... 179
List of Figures

Figure 1. Proposed LNG and pipeline projects in Northern B.C. as of January 2016...... 2
Figure 2. Mine Life Cycle with estimated time periods and workforce. ......................... 21
Figure 3. LNG Life Cycle with estimated time periods and workforce. ............................ 22
Figure 4. Kitsumkalum First Nations Territory and Consultative Boundary. .................. 55
Figure 5. Haisla Nation Traditional Territory ................................................................. 58
Figure 6. Q1 results for education status by male, female, youth and on/off-reserve.... 79
Figure 7. Q1 results for education status by age groups. .................................................. 80
Figure 8. Youth, 18 to 30 yrs. employment status, n=42. ............................................ 83
Figure 9. Females, 18 to over 60 yrs. employment status, n=87................................. 83
Figure 10. Males, 18 to over 60 yrs. employment status, n=82................................. 84
Figure 11. Kitsumkalum members not employed and % looking for work .................. 84
Figure 12. % Responses from all age groups on what type of training is preferred. ..... 87
Figure 13. Education aspirations for the 18 to 30 yrs. age group. ................................. 88
Figure 14. Education aspirations for the 31 to 40 yrs. age group. ................................. 88
Figure 15. Education aspirations for the 41 to 50 yrs. age group. ................................. 89
Figure 16. Education mobility for all age groups. .......................................................... 90
Figure 17. Kitsumkalum members work mobility ......................................................... 91
Figure 18. General mobility - life choices. ................................................................. 92
Figure 19. Types of businesses Kitsumkalum members are interested in starting...... 95
Figure 20. Comparison of socio-economic status of Kitsumkalum members. ............ 120
Figure 21. Location of eelgrass habitats and B.C.MCA ECO conservation areas ...... 146
Figure 22. Kelp distribution in the PNW and Aurora LNG proposed project areas ...... 153
Figure 23. Proposed Sustainable Development Framework ....................................... 162
## Lists of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>AANDC</td>
<td>Aboriginal Affairs and Northern Development Canada</td>
</tr>
<tr>
<td>BCEAA</td>
<td>British Columbia Environmental Assessment Act</td>
</tr>
<tr>
<td>BCEAO</td>
<td>British Columbia Environmental Assessment Office</td>
</tr>
<tr>
<td>CAAQO</td>
<td>Canadian Ambient Air Quality Objectives</td>
</tr>
<tr>
<td>CAC</td>
<td>Criteria Air Contaminant</td>
</tr>
<tr>
<td>CCME</td>
<td>Canadian Council of Ministers of the Environment</td>
</tr>
<tr>
<td>CEAA</td>
<td>Canadian Environmental Assessment Act</td>
</tr>
<tr>
<td>CMHC</td>
<td>Canadian Mortgage and Housing Corporation</td>
</tr>
<tr>
<td>CO2e</td>
<td>Carbon Equivalent</td>
</tr>
<tr>
<td>ETE</td>
<td>Education, Training and Employment</td>
</tr>
<tr>
<td>FLNRO</td>
<td>Ministry of Forests, Lands, Natural Resources and Operations</td>
</tr>
<tr>
<td>GHG</td>
<td>Greenhouse Gas</td>
</tr>
<tr>
<td>ICMM</td>
<td>International Council on Mining and Metals</td>
</tr>
<tr>
<td>INAC</td>
<td>Indigenous and Northern Affairs Canada</td>
</tr>
<tr>
<td>LNG</td>
<td>Liquefied Natural Gas</td>
</tr>
<tr>
<td>MARR</td>
<td>Ministry of Aboriginal Relations and Reconciliation</td>
</tr>
<tr>
<td>MOE</td>
<td>Ministry of Environment</td>
</tr>
<tr>
<td>NWBC</td>
<td>Northwest British Columbia</td>
</tr>
<tr>
<td>ORAAP</td>
<td>Off-reserve Aboriginal Action Plan</td>
</tr>
<tr>
<td>PNW LNG</td>
<td>Pacific Northwest Corporation Liquefied Natural Gas</td>
</tr>
</tbody>
</table>
RTA  Rio Tinto Alcan

UBC  University of British Columbia

UNBC  University of Northern British Columbia
Acknowledgements

I am thankful to so many people for supporting me and my research on this topic. First, my Supervisor, Dr. Marcello Veiga for supporting me in my ideas and providing guidance along the way. I have learned so much from Dr. Veiga about the interface between academics and community and environmental and socio-economic effects. To Dr. Bruce Marshall, thank you for guiding me in the writing process and continually providing me with positive encouragement. Thank you to Dr. Malcolm Scoble for providing guidance on the content of my dissertation. And of course, thank you to Kitsumkalum First Nation Chief Don Roberts and Council members, Steve Roberts, the Band Manager, Rina Gemeinhardt, Environment, Lands and Referrals Manager, and members of the Kitsumkalum First Nation for completing the surveys to support my research. And finally, thanks to representatives of the five sectors who generously donated their time for interviews.
Dedication

I dedicate this dissertation to my late mother, Bronwen Mary Stokes, and my father, one of my best friends, Wilfred Peter Stokes. My parents always supported me physically, emotionally, and economically in whatever I chose to do. As a mining family, I learned as a child, people should benefit from the extractives industry and the environment should be cared for. I believe my career has been inspired by this and am truly thankful for this.

I would also like to dedicate this dissertation to my two children, Nicola Marie McIntosh and Brittany Anne Stokes, who also supported me in my dreams and were so patient with me along the way.
1 INTRODUCTION

1.1 Statement of the Problem

The Liquefied Natural Gas (LNG) export industry has become an internationally recognized opportunity for economic development with terminal projects recently constructed or in the planning phase to move extracted gas to market. These large developments often in the billions of dollars to construct will create impacts, benefits and likely boom and bust dynamics for affected communities resulting from the phases of development. However, benefits such as training and jobs, contracting opportunities, influx of revenue into the local economy, investment in community infrastructure and other positive effects often do not outweigh the negative impacts for those living in poverty (Ross, 2003; Pegg, 2006; Gamu et al, 2015). While the land and water resources which Indigenous Peoples have relied upon for thousands of years for sustenance can suffer negative impacts due to resource development (Zarsky and Stanley, 2013), their ability to qualify for employment and contracting opportunities can be limited due to their socio-economic status (Gibson and Klinck, 2005; Langton and Mazel, 2008; Haley and Fisher, 2012; Dylan et al, 2013).

As of April 2017, 14 Liquid Natural Gas (LNG) terminal projects and four gas transmission pipelines (Figure 1) have been proposed (British Columbia LNG in B.C., 2017) for implementation in northern B.C., which is a region likely to become the main export hub of B.C.’s LNG industry. Six LNG terminals are proposed in Prince Rupert, one north of Prince Rupert near Lax Kw’alaams, three in Kitimat Arm, and one each in Stewart, Kitsault and the Nasoga Gulf. A study commissioned by the Conference Board of Canada estimated if two or three projects were to be constructed in B.C. exporting 30 million tonnes per annum of gas, between 55,000 and 93,000 construction jobs and 33,000 permanent jobs would be created inclusive of the associated gas wells and pipelines. Furthermore, revenues including corporate, personal and indirect taxes and royalty revenues to Canada were estimated to be $6.2 billion per annum, of which $3 billion per annum would flow from B.C. (Robins et al, 2016).
Figure 1. Proposed LNG and pipeline projects in Northern B.C. as of January 2016
Terrace, B.C. is a major business center in the northwest located 56 km north of Kitimat and 144 km east of Prince Rupert and is influenced by industrial activity in both Prince Rupert and Kitimat. Three projects and their associated pipelines, Kitimat LNG ($4B) and LNG Canada ($40B), both in Kitimat, and Pacific Northwest LNG ($16B) in Prince Rupert, have received Environmental Assessment (EA) approvals through the Canadian Environmental Assessment Act (CEAA, 2012) and B.C. Environmental Assessment Act (BCEAA, 2002) processes. However, all projects await a financial investment decision (FID) to start major construction.

With an anticipated boom in northwest B.C. from LNG developments, there will be direct and indirect socio-economic and environmental effects to Aboriginal Peoples living in the region. Direct effects include employment and contracting opportunities and loss of access to traditional use areas. Indirect effects will result from the influx of workers and their families and the increased housing cost, reduced access to healthcare services, and increased pressure on harvesting foods inland and on the coast. Additionally, for those First Nations who have inherent rights and title to the territory where the developments are proposed, agreements are likely to be signed both with the Province and with each proponent providing revenue sharing, employment and contracting benefits resulting in shared value. This research investigates at the local level the socio-economic status and aspirations of an affected Nation to assess the potential for individuals to benefit from employment and contracting opportunities and to what extent continued access to traditional use areas may be affected by LNG developments. Furthermore, socio-economic barriers are identified that may prevent an Aboriginal community from progressing towards sustainable development utilizing the benefits that can come from large resource developments.

1.2 Purpose and Hypothesis

The results of different extractive industry studies investigating the benefits and impacts from large resource development projects have found that people in poverty or on a low fixed income suffer disproportionately, due to their inability to participate in the benefits generated (Ross, 2003; Pegg, 2006; Lawrie et al, 2011; Parlee 2015; Ganu et al, 2015). First Nations in B.C. are still very disadvantaged in terms of income, education,
housing, and other socio-economic factors, when compared with the non-Aboriginal B.C. and Canadian population. The purpose of this study is to investigate how LNG can result in positive effects by contributing to economic and social sustainability of First Nations communities in northwest B.C. The study examines socio-economic, cultural and environmental factors that influence the viability of First Nations to benefit from LNG development projects and how predicted impacts can affect their resiliency.

1.3 Justification of the Dissertation

Recently, the District of Kitimat and the City of Terrace experienced an influx of construction workers, as approximately 3000 workers were required in 2014 (Globe and Mail, 2014) for the three-year Rio Tinto Alcan (RTA) Modernization Project. The price of housing increased very quickly, leading to difficulty finding vacancies in both Kitimat and Terrace. “Renovictions” resulted in people having to move from their homes, as rents were no longer affordable. This is a typical boom-town scenario, where the most vulnerable people are the first to be affected by the increased cost of housing, followed by people with middle class incomes (Ennis et al, 2013). If LNG and pipeline projects move forward in addition to other planned projects in mining and oil refineries in the region, Prince Rupert, Terrace and Kitimat will experience amplified boom-town effects.

Although each LNG and pipeline development project in B.C. is subjected to a permitting and/or an approval process, the assessment may end up completely overlooking or not investigating fully all of the socio-economic impacts. The Canadian Environmental Assessment Act (2012) requires the applicant to obtain a Project Approval Certificate in order to assess Aboriginal socio-economic issues only within the context of environmental effects. Other socio-economic impacts that become accentuated, due to the inherent vulnerability of Aboriginal peoples, are assessed in general terms and often deemed insignificant through the environmental assessment process. The B.C. Environmental Assessment office (BCEAO), under the BCEA Act Reviewable Projects Regulation (2002), requires applicants to assess socio-economic effects and benefits

---

1 “Renovictions” is a term used to describe the scenario of landlords wanting to renovate and either evicting their existing tenants and/or increase rents to the extent that the original tenants can no longer afford the accommodation and must move.
from the proposed project, although vulnerable groups like Aboriginal peoples are not assessed separately. Therefore, the potential effects to those who will not be able to benefit from LNG related work opportunities, or participate in other economic and social benefits created by the boom is obscured. Moreover, smaller projects that do not qualify to undergo a Canadian or B.C. Environmental Assessment are not evaluated for their socio-economic impacts or benefits, despite their potential to contribute to cumulative effects.

Even when these impacts are assessed, management plans are often not detailed enough to adequately monitor the effectiveness of mitigation or assign responsibility, as it is up to the government to provide support if deemed necessary. Furthermore, the scope of these management plans does not include the impacts caused by other industrial developments, which may occur at the same time.

Aboriginal people in Canada, and especially in B.C., have historically been negatively impacted by economic development. The main reasons are: 1) the lack of meaningful socio-economical participation in development activities (McDonald, 1994), and 2) the loss of access to traditional foods and use areas, due to physical displacement and pollution impacting food quality (McDonald, 1994). Although various initiatives have been implemented in recent years and the inequality gap is narrowing between Indigenous and non-Indigenous peoples in Canada (Cooke et al, 2007), there remains significant differences regarding housing and education/employment statistics for these two groups. By examining the potential benefits and effects/impacts at the local level as proposed by this study, a sustainable development framework for Indigenous communities participating in large-scale development projects can be developed.

1.4 Research Objectives

The general objective of this study is to examine the different socio-economic perspectives of First Nations communities in areas of northern B.C., where LNG projects are currently proposed. Additionally, this study aims to analyze the different vulnerabilities that First Nations communities face in relation to LNG projects and the necessary steps needed to improve their long-term outlook, especially in relation to the capacity of these communities to take advantage of large-scale development opportunities. Specifically,
aspects related to affordable housing, ability to acquire good paying jobs/careers, and access to hunting, gathering and fishing resources are investigated in this study. Potential environmental impacts from LNG developments are also investigated as an additional component to social and economic sustainability, especially in the cultural context of Aboriginal access to traditional foods and resources.

1.5 Research Questions

With the expansion of industrial development in the areas of Prince Rupert, Kitimat and Terrace, four questions are central to this research:

1) What are the barriers that need to be overcome in relation to LNG developments in northwest B.C. in order to enable First Nations to participate in the benefits?

2) What are the commonalities and differences in views among industry, government and First Nations, in terms of what is needed to move First Nations communities towards sustainable development?

3) How can traditional cultural activities on the land and water continue despite the loss of access and use of some areas due to LNG developments?

4) What recommendations could be made to ensure that LNG developments can serve as a catalyst for long-term sustainable planning in First Nations communities?

1.6 Applied Contribution of Research

This research encompasses a multi-faceted approach to examine how large-scale resource development projects both positively and negatively affect Indigenous people, looking for ways in which socio-economic benefits can be maximized to contribute to long-term sustainability of First Nations communities. The final outcome of this research is the development of a framework that can be utilized by Indigenous communities, governments, and industry to guide their planning processes and negotiations, thereby improving Indigenous Peoples’ capacity to benefit from the socio-economic benefits created by resource developments within their respective traditional territories, while mitigating the potential negative effects/impacts over the long-term.
1.7 **Academic Contribution of Research**

This research addresses the needs and issues of Indigenous peoples in terms of the potential benefits and negative impacts of large-scale resource developments within their traditional territories. Furthermore, this study analyzes different perspectives from key stakeholders, including B.C. First Nations communities, resource development companies, governments, and economic development organizations, in relation to different barriers that may reduce the capacity of Indigenous Peoples to develop sustainably. In turn, the results from this study will serve to help increase the long-term sustainability of First Nations communities in northwest B.C. impacted by LNG projects, especially for the most vulnerable populations.

1.8 **Thesis Structure**

This thesis is comprised of six chapters beginning with the Introduction to describe the problem, present the research questions, provide justification for the research and describe how the research will contribute to the body of knowledge studied.

Chapter 2 provides the literature review covering a variety of topics such as a brief description of the natural gas industry, Aboriginal Peoples in Canada historical and present conditions, resource development and potential effects to Aboriginal Peoples, boom and bust dynamics from the mining sector, what the extractives industry could offer Aboriginal Peoples, and governance and sustainable development defined.

The research methodology, a description of the study area and the Nations occupying the study area is included in Chapter 3.

Chapter 4 presents the results and includes a discussion of the results segregated by the five main Themes identified: 1) education, training and employment, 2) socio-economic issues, 3) supports needed, 4) environmental issues, and 5) governance.

Chapter 5 synthesizes the data and information collected during the research and suggests a new framework to guide sustainable development in Indigenous communities utilizing the benefits that can come from extractive industry projects.
Conclusions and recommendations for future research are incorporated into Chapter 6, along with contributions and claim to originality.
2 LITERATURE REVIEW

To explore the potential for the LNG industry to contribute to sustainability in First Nation communities, potential impacts and benefits from the industry in general must be explored, and specifically for those First Nations with traditional territory at the site of the proposed LNG facilities. Governance in relation to the extractives industry from an Aboriginal, corporate and government perspective is also investigated. Other literature reviewed includes Indigenous colonization in Canada, Indigenous communities and resource development, and the non-renewable extractives industries and boom-bust dynamics. Finally, a brief review of the concept of sustainable development from different perspectives relevant to this thesis is provided.

2.1 LNG and its Potential Benefits and Impacts

2.1.1 The Natural Gas Industry

Natural gas consists of mainly methane with small amounts of liquid hydrocarbon and nonhydrocarbon gases (CAPP, 2017). Prior to use as a fuel or to make materials and chemicals, the gas must be treated to remove impurities by chemical transformations, either at the gas well before it is transported or at a liquid natural gas (LNG) terminal (Raj et al, 2016). While technology exists to capture gas at the wellhead rather than flaring (burning) or venting the gas for safety reasons and emitting greenhouse gases (GHGs), the cost of implementing a gas recovery system may not be economically practical (CAPP, 2017). The extraction, purification, and use of natural gas, like oil and coal, emits GHGs to the atmosphere (Raj et al, 2016).

Hydraulic fracturing (or fracking) is an unconventional\(^2\) way of extracting gas from shale deposits (CAPP, 2017). Large quantities of water, sand and various chemicals are injected into shale rock at high pressure to free and extract gas. Different known health, safety and environmental problems have been identified including methane contamination of groundwater from deep drilling or improper well construction (Osborne et al., 2011; Cooley & Donnelly, 2012), well blowouts, which may contaminate the

\(^2\) Unconventional natural gas refers to tight gas, shale gas or coalbed methane. Conventional natural gas refers to “pools” of gas found underground that flows naturally or can be pumped to surface (Alberta Energy Regulator, 2017).
surrounding environment with fracking chemicals (McAllister, 2011), use and waste of large amounts of water (Howarth et al, 2011), improperly contained wastewater, which can contaminate groundwater resources (Cooley & Donnelly, 2012), and seismic activity. A correlation between hydraulic fracturing and injection of wastewater with seismic activity has been shown to exist (McGarr et al, 2015; Atkinson et al, 2015; Folger and Tiemann, 2015; Lagarenne, 2015; Rivard et al, 2014).

As a result of new technology being developed (horizontal drilling and hydraulic fracturing) shale gas deposits in North America are more accessible and combined with reduced transportation costs (Holz et al, 2014; Barnes and Bosworth, 2015), internationally-traded gas has increased to 1/3 of total gas produced in 2011 (Holz et al, 2014) and 1/4 of total global energy consumption (Cassidy and Kosey, 2015).

Key drivers and uncertainties for natural gas markets include access to deposits, the role of international trade, and the impact of climate policies (Holz et al, 2014). Japan is currently the largest importer of LNG, while Qatar is the largest exporter. However, Australia is currently gearing up and could be the largest global exporter by 2018 (Cassidy and Kosey, 2015).

Most commodities have a global price based on demand and supply. The global gas market is made up of three distinct pricing structures: 1) Asian - based on long-term contracts (15 to 20 yrs.) which correlates with the price of oil, 2) North American - based on a competitive market system, and 3) European – based on competing energy sources (Geng et al, 2014). The Asia system was developed in 1969, when Japan began importing gas and the only other fuel at the time used for power was petroleum. The European pricing, otherwise known as ‘spot’ pricing, is short-term (one to four yrs.) and currently accounts for 25 to 30% of total LNG trade. Spot pricing has increased in Asia and appears to be a more relevant indicator of market conditions (Cassidy and Kosey, 2015). With the increase in global LNG trade relative to piped gas, a unified natural gas market is believed to be on the horizon (Geng et al, 2014).
2.1.2 Social and Economic Effects from LNG Terminals

The people who are most vulnerable to resource development are those affected by the loss of access to resources on the land and water and are unable to benefit from employment and contracting opportunities. In addition to not participating in the economic benefits, these people have to adapt to increases in the cost of living as accommodation becomes more expensive and reductions in access to healthcare. Historically, First Nations Peoples in Canada have been excluded from economic activity when compared with non-Aboriginal populations (McDonald, 1994) and generally do not have adequate housing, education or employment. Reduced access to traditional foods as a direct or indirect impact from large resource developments can result in food security problems, which further exacerbates First Nations’ vulnerability to development (Gibson and Klinck, 2005).

Resource industry-related jobs could provide First Nations Peoples with an opportunity to participate in the Canadian economy, which may result in achieving a better standard of living for individuals and their families. However, the challenge is to focus on the long-term sustainability of these jobs, while emphasizing training, education and diversification of the regional economy. In order for economic development to be a success, negative impacts to the environment and society need to be minimized, while maximizing lasting benefits to communities, in order to ensure economic, social and environmental sustainability over the long-term.

2.1.3 Environmental Effects from LNG Terminals

Environmental effects of major concern from LNG developments like other developments differ between the construction and operations phases. Additionally, siting of a facility’s location can result in negative effects, as there is the potential for accidents exposing people and wildlife to risk.

Apart from the potential of an extreme natural hazard, such as an earthquake or hurricane, which are essential factors to consider when siting an LNG facility (IFC 2007), vapor can result in a jet or pool fire from a spill contacting a cool surface producing boil-off gas (Mokhatab et al, 2014), resulting in an explosion. Although rare, two large explosions have occurred from LNG plants; one in Cleveland Ohio in 1944, where 128
residents were killed (Foss, 2003), and in Algeria in 2004, when 100 workers were killed (Parfomak and Flynn, 2004). In Cleveland, a pool fire from a vapor cloud reaching the surrounding streets and sewer system was created from a tank failure and the absence of an earthen berm. The reason for the tank failure was attributed to the shortage of stainless steel to construct a safer tank during World War II (Foss, 2003). The explosion in Algeria was investigated and found to be caused by an undetermined hydrocarbon leak, beginning with a small explosion which ignited further (Hightower, 2004).

The risk of a gas leak reaching beyond the facility or tanker caused by a jet or pool fire or explosion can now be estimated using site-specific parameters (Raj and Lemoff, 2009). This prediction also accounts for the engineered design of the plant conforming to legislated standards within the country of siting (Raj and Lemoff, 2009; PNW LNG, 2014a). Although siting of the Pacific Northwest (PNW) LNG project, as described in their EA (2014), did not list the close proximity of a community (~500 m to the first boat or house) as a considering factor, the analyses of potential malfunctions and accidents in the EA concluded that the risk of a fatality in Port Edward, the closest community, is less than one in ten million years (PNW LNG, 2014a). This risk meets the acceptable levels as identified in the UK Individual Fatality Risk standards (Raj, 2009).

Marine life is potentially affected by LNG developments directly within the foreshore environment and indirectly by noise, vibration from construction and from the risk of contaminant uptakes (if present) in the sediments during the initial and maintenance dredging process (IFC, 2007). Foreshore marine plants and animals, such as eelgrass, kelp, crabs, and clams, would be subjected to direct loss of foreshore habitat from the construction of piers, wharves, pillars and other structures (IFC, 2007). Marine animals are known to avoid noise and vibration and may be affected by their inability to frequent the area for foraging or breeding (IFC, 2007).

Total suspended sediments and the contaminants within (if present) have the potential to increase in the water column during dredging, causing acute and chronic impacts to marine life (Todd et al, 2015). Increased TSS can cause clogging of gills and some metals, polyaromatic hydrocarbons (PAH) and polycyclic biphenyls (PCB) could become biologically available while the changes in distribution of sediments and the
substrate can affect marine plant survival (Todd et al., 2015). For the PNW LNG project, the EA noted that the re-suspension of sediment will be highly localized and the furans and dioxins are currently elevated above the CCME Interim Sediment Quality Guidelines (ISQS). However, the re-suspension of these sediments was deemed to not be a risk to marine organisms, as the concentrations are below the Probable Effect Level (PEL) (PNW LNG, 2014a). These conclusions are similar to those made by LNG Canada in Kitimat Arm, where despite the historic contamination of sediments in the proposed dredging location resulting from various historical discharges, including the aluminum smelter, pulp mill, and methanol plant, it is conjectured that bioavailability of these contaminants will not increase, due to resuspension in the water column (LNG Canada, 2015). However, Martins et al. (2012) describes the international regulatory frameworks as being inadequate, due to the fact that SQSs do not represent the risk of toxicological risk related to dredging activities, as indicated by their study of elevated PAH and PCB contaminants in mussels after dredging activity.

Further to the potential impacts of dredging, the deposition of contaminated sediments at a disposal site at sea must be adequately characterized in terms of the toxicity of sediments and the potential for the dispersal of the contaminants deposited at the site chosen. For example, PNW LNG have modelled their preferred disposal site for sediment dispersal, however the modelling is based on flow data collected at depths of 15 m and 98 m, while the site has a maximum depth of 200 m (Faggetter, 2014). It is anticipated this issue will be resolved prior to disposal as the conditions of approval as listed in the Decision Statement (CEAA (2016a) require the proponent to confirm through modelling the predicted changes to water quality from dredging disposal.

Emissions from LNG facilities and LNG tankers can impact human health and ecosystem health, and wastewater from camp facilities can impacts estuary or ocean ecosystems (IFC, 2007).

In Northwest B.C., coastal waters provide food, contribute to the natural biodiversity and ecosystem health of the area, and are highly valued within the culture, traditions and spirituality of Indigenous cultures. Furthermore, some coastal areas are highly productive, with eelgrass providing important habitat for migrating salmon, a very
important food fish for First Nations, as well as being a source of revenue for recreational and commercial fisheries. In addition, salmon is a crucial species for ecosystem functioning, given that so many other species rely on salmon for food.

One of the first LNG projects that was proposed was the construction of PNW’s facility on Lelu Island in Chatham Sound in the Skeena River estuary. The Skeena is the second largest river in B.C. and one of the longest rivers in the world without a dam. The Skeena estuary is unique, as it is comprised of mudflats and intertidal areas rather than an intertidal delta, providing key habitat for several rare aquatic species and based on river flow characteristics, and shares an estuary with the Nass River (Ocean Ecology, 2014).

Anadromous fish migrate through the eelgrass beds at Flora Bank adjacent to the mouth of the Skeena River. In 2014, Ocean Ecology produced a habitat suitability index (HSI) derived from modelling that shows salmon species group into two feeding categories where Chinook, pink and chum (epibenthic feeders) as juveniles spend time in shallow water environments in eelgrass beds or sheltered sub-estuaries, while sockeye, Coho, and steelhead spend their early life stage in deep water environments (neritic feeders). The neritic feeders migrate through the eelgrass at Flora Bank while the epibenthic feeders stay for some undetermined amount of time. The HSIs for both types of salmon feeders are high for this area along with a few locations on the southeast shore of Prince Rupert Harbour (on the Tsimpsean Peninsula) and in the basins on the east side of Kaiein Island (Ocean Ecology, 2014). Moreover, those species that rely on shallow water for feeding depend on nearby habitat as they leave the river as they would be unable to cross Chatham Sound to reach suitable habitat on Porcher Island (Ocean Ecology, 2014).

The proposed PNW LNG facility is to be located on Lelu Island, with a trestle extending out alongside eelgrass beds in Flora Bank, a sandy reef-like area visible at low tide next to Lelu Island. There are commercial, recreational and food fisheries in the area and the project is within the traditional territory of Tsimshian Nations: Gitgaat; Gitxaala; Kitselas; Kitsumkalum; Metlakatla; and Lax Kw’alaams Bands. Both adult and juvenile salmon use the Skeena River estuary on their way upriver to spawn or when the juveniles
return to the ocean to spend the majority of their life cycle (Moore et al., 2016). Due to the abundance of fish in the estuary from mid May to early July, studies have shown that the eelgrass beds are crucial to the survival of juvenile salmon (Hoos, 1975; Carr-Harris et al., 2015)

The federal Environmental Assessment (EA) process for the PNW project has resulted in two types of studies assessing the potential for changes in sediment movement around Flora Bank to negatively affect the eelgrass beds. Although PNW has predicted that effects would be minimal and insignificant from the results of their Dynamic Model utilizing local baseline conditions, the company is committed to collecting more wave, current and turbidity data in order to update the model upon completion of the engineering design for the project (PNW, 2016). Furthermore, this commitment is now a legal requirement as part of the conditions of approval. In comparison, McLaren (2016) studied the surficial sediments of Flora Bank using a Kinematic Modeling approach and concluded that the proposed trestle and berthing structure will likely impact the eelgrass beds, due to the change in flow dynamics around Lelu Island.

Although natural gas composition feeding the LNG facility before treatment can vary, it is generally comprised of 95% methane (Mol %; dry basis), 2% ethane, 0.6 to 0.7 % each of nitrogen, propane and carbon dioxide, with 0.1% n-Butane, and less than 0.1% i-Pentante, n-Pentane and hydrogen sulphide (PNW LNG, 2014a, Appendix C). NOx, SO2, and PM2.5 in ambient air can affect human health and when deposited to ecosystems, as well as contribute to global GHGs affecting climate change.

Air quality dispersion modelling is used by EA practitioners to predict what the Criteria Air Contaminants (CAC) concentrations will be from a project when added to the background (MOE, 2016). It is often conservative because there is uncertainty in the modelling process (MOE, 2016). However, it is the only tool available to assess whether the CACs will exceed an acceptable limit, the Canadian Ambient Air Quality Objective (CAAQO) or interim objectives, set by the B.C. Ministry of Environment for the protection of human health and ecosystems (MOE, 2016). The modelling incorporates meteorology and terrain data when deriving concentrations that are then mapped with receptors to understand the impacts and determine significance. If the predicted air quality
concentrations for CACs is higher than the AAQOs or interim objectives, then a human health and ecological risk assessment can be undertaken to identify what the impacts will be (MOE, 2016).

In 2016, considering the potential for several LNG projects to move forward, air quality cumulative effect assessments were conducted for the Prince Rupert and Kitimat areas to determine NO\textsubscript{x} and SO\textsubscript{2} compound concentrations and their contribution to PM\textsubscript{2.5} formation (ESSA, 2014; MOE, 2016). The updated\textsuperscript{3} Prince Rupert Airshed Study (MOE, 2016) modelled eight scenarios including the baseline, partial and full buildout of proposed projects for PM\textsubscript{2.5}, NO\textsubscript{x}, and SO\textsubscript{2} with various emission reducing technologies. The Kitimat Airshed Study (ESSA, 2014) modelled eight scenarios with different levels of treatment combined with emissions from one oil refinery, four LNG facilities and associated marine transportation emission sources. An additional four scenarios were modelled for the Kitimat area adding in the proposed B.C. Hydro gas turbine powered electric generating facility to the full buildout.

The modelled predicted air quality in the receiving environment using emissions data was compared to the PM\textsubscript{2.5}, NO\textsubscript{x} and SO\textsubscript{2} Canadian Ambient Air Quality Standards (CAAQs) for human health (ESSA, 2014; MOE, 2016). Modelling results were compared to four separate values for each parameter representing a range of good to poor ambient air quality. If modelling results are lower than the lowest value for each parameter within the CAAQO guidelines, then no management action is required to reduce predicted emissions or to conduct a human health risk assessment. If the modelled concentration exceeds the lowest level or matches a higher level associated with more intense management action, then either additional management action or a human health risk assessment would be required respectively (CCME, 2012).

A few locations in the Prince Rupert industrial area for the LNG full build-out modeling scenario were predicted to experience degraded ambient air quality, indicating potential effects to human health due to elevated levels in PM\textsubscript{2.5} and NO\textsubscript{x} (MOE, 2016). In comparison, the Kitimat study showed that emissions from the proposed LNG facilities

\textsuperscript{3} The original study was produced in 2015 and was updated in 2016 to include a more realistic baseline condition using more air quality monitoring data and improved emission estimates from proposed projects.
did not pose a health risk. However, when SO₂ emissions were assessed combined with the existing permitted emissions from the RTA Smelter, the highest management level of the CAAQOs would be exceeded for the SO₂ hourly 99th percentile for all scenarios studied in the City of Kitimat, Kitamaat (Haisla) Village, and the industrial area (ESSA, 2014). In turn, under the worse case scenario studied, it was estimated that the incidence of respiratory illness episodes (e.g. asthma exacerbation events) would increase by 70% in these three locations (ESSA, 2014).

Loading of NOₓ and SO₂ to terrestrial ecosystems can result in impacts to sensitive species directly if the loading exceeds a critical threshold and indirectly through acidification of the soils dissolving aluminum in the soil impacting tree health (MOE, 2016). Acidification and eutrophication of lakes and creeks can also be impacted by NOₓ and SO₂ loading from industrial contaminants released to the airshed (MOE, 2016).

Soils and terrestrial ecosystems would be at risk under the full buildout scenario in the Prince Rupert area for acidification for about 6.9 km² of land and 65 km² of land for eutrophication (MOE, 2016). The concentration of acidification would not be noticeable on vascular plants however the addition of nitrogen as a nutrient is predicted to change the epiphytic macro-lichen species composition potentially affecting the terrestrial ecosystem in the area (MOE, 2016). Of the 51 lakes characterized for water chemistry in the Prince Rupert Airshed Study, only one was modelled to become acidic under the full buildout scenario and 1% of 859 lakes considered for eutrophication would be affected (MOE, 2016).

Critical loads of acidity are attributable to the SO₂ contribution to the airshed in Kitimat rather than NOₓ and for the full buildout scenario is estimated to cover an area of 26.91 km². Critical loads of nutrient nitrogen cover an area of 15.97 km² for the full buildout (ESSA, 2014). Of the 80 lakes modelled for acidity, although a bias exists as the lakes chosen are acid sensitive⁴, critical load exceedances were shown for 21 with the majority north of Kitimat relative to south of the concentrated industrial centre (ESSA, 2014).

---

⁴ Some lakes are naturally acidic while others may be due to historical industrial emissions from Rio Tinto Alcan, the old Eurocan pulp mill, and the old Methanex plant in Kitimat as the loading occurs in a plume north of Kitimat.
Both project air quality and cumulative air quality impacts to marine ecosystems were not studied for the Prince Rupert or Kitimat airsheds. However, ocean productivity is limited by nitrogen inputs and ocean ecosystems are more sensitive to eutrophication than freshwater aquatic ecosystems (Krzyzanowski, 2010). The addition of nitrogen could theoretically increase the number of algal “red tide” blooms (Krzyzanowski, 2010). Mosses, lichens and vascular plants are known in general to benefit from the increased availability of nitrogen, however at very high concentrations damage or mortality can occur (Cunha et al, 2002) and some species will outcompete when exposed to high nitrogen concentrations (Krzyzanowski, 2010). Marine benthic invertebrates are also sensitive to high concentrations of nitrite (CCME, 2003), however these impacts were also not discussed in either the Prince Rupert or the Kitimat studies.

In April 2016, Canada ratified its commitment to the Paris Agreement, otherwise known as the United Nations Framework Convention on Climate Change, with 110 other countries to implement initiatives for combating climate change and adapting to its effects (UNFCCC, 2016). The agreement invites all countries to participate in the overall reduction of GHGs and strengthen adaptation to climate change. Due to Canada’s economic dependence on natural resource extraction, its strategy to address climate change constitutes mainly financial incentives such as carbon credit trading and carbon taxes, while at the same time decreasing vulnerability and increasing resilience to climate change effects.

In Canada, the two main sources of GHG in 2015 was the oil and gas sector (26%) and the transportation sector (24%) (ECCC, 2017). Other sources of GHG contributing between 7 and 12% each include buildings, electricity, heavy industry, agriculture, and waste and others (ECCC, 2017). The heavy industry sector includes emissions from mining, smelting and refining, pulp and paper, iron and steel, cement, lime and gypsum and chemicals and fertilizers, while waste and others includes light manufacturing, construction, forest resources, waste and coal production (ECCC, 2017).

Although GHGs did not form part of the cumulative air quality assessments in either Prince Rupert or Kitimat, each proposed LNG project is required to predict its GHG emissions. The contribution of GHG emissions from the PNW LNG Project, in
accordance with the conditions of federal approval, will not exceed 4.3 metric tonnes per year (Mt/yr.) carbon equivalent (CO2e) (CEAA, 2016b). Combined with upstream emissions, including natural gas production, processing and pipeline transmission, estimated at 8.8 to 9.3 Mt/yr. of CO2e (ECCC, 2016), total project emissions are estimated to be between 13.1 and 13.6 Mt/yr. of CO2e. In 2015, B.C. emissions from all sources were 60.9 Mt CO2e, representing 8.4% of Canada’s total of 722 Mt/yr. (ECCC, 2017). Based on 2015 emissions, once PNW LNG and its upstream components are constructed and operating, B.C.’s total emissions would increase by 1.9% to 10.3% of Canada’s total emissions. Comparatively, although B.C. is one of the top five Provinces in Canada emitting GHGs, Alberta emitted the highest amount at 274 Mt/yr., followed by Ontario with 166 Mt/yr. CO2e in 2015 contributing 38% and 23% respectively (ECCC, 2017).

In terms of methane and other emissions from LNG developments contributing to global GHGs, there is currently much scientific discussion over whether the emissions associated with the hydraulic fracking and processing of shale gas reserves are less than those of coal, oil or conventional natural gas. Some researchers have shown shale gas to be a suitable bridging fuel or transition fuel to cleaner energy sources (Cathles, 2012; Gouw et al, 2014) while others find GHG emissions to be either worse or on par with coal or oil (Stephenson et al, 2012). The debate focusses on the uncertainty of input variables to model emissions, such as: venting of excess CO2 during shale gas extraction; flaring and recovery practices; other fugitive emissions; the longevity of well production; end use application of the gas (generation vs heating); the factor used for estimations of potential global warming related to methane; the time horizon of global warming potential; and assumptions made about the composition of shale gas (Stephenson et al, 2012). In general, methane losses to the atmosphere during the extraction process and usage of the fuel are the focus of the debate.

Despite the conflicting results found by researchers on comparisons made between GHG emissions from shale gas, coal and oil, there is agreement between researchers that the main sources of GHGs from shale gas extraction to combustion are venting and flaring during extraction and recovery, and combustion emissions (Cathles,
2012; Gouw et al, 2014; Stephenson et al, 2012; Raj, 2016). Although shale gas has been shown to burn cleaner than coal in the combustion process in terms of CO₂ emissions, reducing the amount of methane leakage by capturing gas at the well sites rather than venting or flaring can reduce GHGs further (Raj et al, 2016).

Several other LNG projects are lining up for approval in northwest B.C. along with two proposed refineries that would receive oil by pipeline or rail from Alberta and then ship to Asia from either Prince Rupert or Kitimat (BCEAO, 2017). Additionally, completion of the $700 million high-voltage Northwest Transmission Line in 2013, which goes 335 km from the town of Terrace to the Red Chris copper mine in B.C.’s Golden Triangle (encompassing the towns of Atlin, Cassiar and Stikine), offers increased mining feasibility in the region, as the cost of power has been dramatically reduced for companies operating in the region (Invest in Northwest B.C., 2017).

With the increased activity in northwest B.C. combined with the current resource management decision making process by the Province of B.C., there is a need to develop a mechanism for managing key environmental values that will incorporate monitoring and decision support (FLNRO and MOE, 2013). The B.C. Ministry of Forests, Lands and Natural Resource Operations (FLNRLO) and the B.C. MOE have therefore initiated the Northwest Cumulative Effects Demonstration Project to “avoid or mitigate cumulative effects from land use activities” (FLNRO and MOE, 2013). The Auditor General in 2015 found that FLNRO was not adequately addressing cumulative effects and suggested the government provide the Ministry with clear direction and the mandate to do so (Auditor General, 2015a).

2.1.4 The Non-renewable Extractives Industry and Boom-Bust Dynamics

The non-renewable extractives industry, notably the oil, gas and mining sectors, move through a cycle of discovery to exhaustion of the resource in a specific geographic area. The mining sector cycle (Figure 2) is analogous to the phases of LNG development from exploration through to closure (Figure 3). Exploration can take five to ten years, depending on the level of effort and scarcity of the resource (AMEBC, 2017). If exploration results show extraction of the resource to be economical, then planning to develop the resource follows with feasibility studies and permitting applications. The full cycle involves
exploration, construction, followed by operations, then implementation of the closure phase (AMEB.C., 2017). Although construction and operations differ between mining and LNG developments, both sectors require hundreds to thousands of temporary workers during construction. However, mining projects require less people for a shorter time during construction and more people during operations than LNG. On average, an operating mine may employ 450 people for 20 yrs., whereas an average LNG facility would employ about 250 people for approximately 25 yrs. (Table 1).

Figure 2. Mine Life Cycle with estimated time periods and workforce.
Source of Exploration data: AMEBC (2017). Feasibility studies/permitting and closure phase timelines are estimated based on industry experience of the author. Development & Construction, and Operations phase timelines and workforce are calculated using the most recent projects proposed, constructed or operated in B.C. as shown in Table 1.
Figure 3. LNG Life Cycle with estimated time periods and workforce. Source of Exploration phase data: AMEB.C., 2017. Feasibility studies/permitting and closure phase timelines are estimated based on industry experience of the author. Development & Construction, and Operations phase timelines and workforce are calculated using the most recent projects proposed, constructed or operated in B.C. as shown in Table 1.

For small resource-dependent communities, the mining boom occurs during construction and beginning of operations, while the bust occurs at closure. In comparison, for the LNG industry, the construction phase becomes the boom, while the beginning of operations involves the bust. The magnitude of the boom-bust dynamic for both industries can increase several times over, if more than one development occurs at the same time.
Table 1. Workforce numbers for mining and LNG projects in northern B.C.

<table>
<thead>
<tr>
<th>Mining Projects</th>
<th>CONSTRUCTION PHASE</th>
<th>OPERATIONS PHASE</th>
<th>PROCESSING OR PRODUCTION RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Peak No. of workers (direct employment)</td>
<td>Peak No. of workers (direct employment)</td>
<td>AT FULL BUILD OUT</td>
</tr>
<tr>
<td></td>
<td>years</td>
<td>years</td>
<td></td>
</tr>
<tr>
<td>Mount Milligan (operating copper/gold)</td>
<td>2.5</td>
<td>700</td>
<td>22</td>
</tr>
<tr>
<td>Brucejack (Proposed gold/silver dore)</td>
<td>2</td>
<td>440</td>
<td>22</td>
</tr>
<tr>
<td>Red Chris (Constructed copper/gold)</td>
<td>1.5</td>
<td>500</td>
<td>18</td>
</tr>
<tr>
<td>Kitsault (molybdenum)</td>
<td>2</td>
<td>700</td>
<td>16</td>
</tr>
<tr>
<td>Roman (coal)</td>
<td>1.5</td>
<td>285</td>
<td>10</td>
</tr>
<tr>
<td>Brule (coal)</td>
<td>1</td>
<td>300</td>
<td>11</td>
</tr>
<tr>
<td>KSM (Proposed gold/copper/silver/molybdenum)</td>
<td>5</td>
<td>1800</td>
<td>51.5</td>
</tr>
<tr>
<td>LNG Projects</td>
<td>Kitimat LNG (in construction)</td>
<td>3</td>
<td>700</td>
</tr>
<tr>
<td></td>
<td>PNW LNG (in permitting; BCEA approved)</td>
<td>5</td>
<td>4000</td>
</tr>
<tr>
<td></td>
<td>LNG Canada (permitted)</td>
<td>5 to 6</td>
<td>7500</td>
</tr>
</tbody>
</table>

Data is sourced from Environmental Assessment Certificate Application documents available on BCEAO Project Information Centre website

**Boom and Bust Impacts related to Resource Development Phases**

The mining industry has been studied extensively in terms of socio-economic effects related to development phases. Some of the negative social impacts that disadvantaged people experience during the boom phase include difficulty in acquiring or maintaining affordable housing, decreased access to healthcare, increased violence, exacerbated drug and alcohol addictions (Putz et al, 2011; Cameron et al 2014), and increases in pregnancies, sexually transmitted infections and mine related injuries (Gibson and Klinck, 2005; Shandro et al, 2011). During the bust phase, negative social impacts have also included mental health issues such as depression and anxiety, which are mainly caused by layoffs (Shandro et al, 2011).

Although positive effects of resource development include contracting opportunities and employment, these opportunities tend to benefit only those that have adequate financial support, family or community support, education, training and qualifications. The most disadvantaged or vulnerable groups often do not qualify for available employment, which is due to a lack of some or all the cited factors.

While most researchers show that negative impacts associated with boom and bust cycles occur most prominently in resource-dependent towns, Hajkowicz et al (2011), in a study of 71 government areas with mining activities across regional and remote Australia, found that resource development had a positive effect on incomes, housing affordability, communication access, education and employment. However, the authors
also acknowledged that the study could have missed the inequalities and negative effects of resource development on disadvantaged people at the local level. Conversely, Tonts et al (2012), in a study of 33 small mining towns in Australia, suggests the type of commodity, company structure and location are factors affecting socioeconomic outcomes from resource developments.

**Boom and Bust Impacts related to Changing Market Conditions**

Businesses that provide products and services to industry provide employment to people living in the community, which in turn contributes to an improved standard of living for individuals and families. For many towns in northern B.C., people are dependent upon staples-based economies, principally from forestry, mining and gas (Markey et al, 2012). Consequently, incomes and standard of living can fluctuate enormously with the entrance and exit of these industries.

Tumbler Ridge, originally established as a town to extract metallurgical coal beginning in 1983, has already experienced several boom and bust episodes. The Quintette and Bullmoose Mines, the two largest employers in the region, closed in 2000 and 2003 respectively, due to declining coal prices. However, by 2010, when prices rose back up, four mines were operating, with three more undergoing environmental assessment processes (Shandro et al, 2011). Then in 2014/2015, global coal prices declined again and three mines in the Peace Region were put into maintenance-only mode, with one of the owners filing for bankruptcy protection in 2015 (Wall Street Journal, 2015).

The Tumbler Ridge example is not an anomaly in northern B.C. Since the late 1800’s, many small towns have been dependent on resource development, having to withstand the occurrence of boom and bust cycles (Markey et al, 2012). People and businesses who work directly or indirectly for the resource extractives industry are subjected to boom-bust cycles created by the fluctuation of global supply and demand. In addition, for some specific projects in the LNG sector, there can be boom and bust dynamics occurring during different phases of development (Benham, 2016).
2.1.5 Scale and Potential Cumulative Effects of Boom-Bust Dynamics

Boom and bust effects are amplified when more than one development proceeds at the same time within a region. Moran et al (2007) and Brereton et al (2008) defined cumulative effects as the successive, incremental and combined impacts of one or more activities on society, the economy and the environment. For example, three LNG projects and a coal export terminal were constructed between 2010 and 2014 in Gladstone, Australia (Cameron et al, 2014; Benham, 2016). Predictions made prior to these developments were there would be limited impacts to housing prices as most construction workers would be placed in temporary housing (Rolf et al., 2012). However, with 13,000 directly employed by the LNG construction projects, although there was a commitment made to implement the Social Impact Management Plans developed by Australia Pacific LNG (2011) and Santos GLNG (2012), housing prices tripled between 2011 and 2013 and the cost of living increased, affecting low-income earners or those not employed by the LNG industry (Cameron et al, 2014; Benham, 2016). Other impacts at Gladstone included increased crime and demand for medical services (Cameron et al, 2014; Benham, 2016). Through interviews conducted with Gladstone residents, Benham (2016) also found that access to recreational sites had been reduced, due to construction and increased boat traffic.

In western Australia, at Chevron’s $52-billion Gorgon LNG project, construction workers were well-paid and 50% were fly-in-fly out. Consequently, the economy in this part of the world boomed, as well as the cost of living. However, those who were not directly involved in benefiting from the high paying jobs became worse off, as described by Peter Strachan, a Perth-based LNG analyst, in the Province newspaper (2013). Although new high-paying jobs were a benefit to communities, Strachan points out that those who continued to be on a fixed income of $75,000 per year were finding it difficult to contend with inflationary living costs. Lawrie et al (2011) assessed three mining towns for boombtown effects and found that although income per capita had increased, those who were on fixed incomes were negatively impacted by the increased cost of housing.

In 2007, at the height of the boom in the oil sands in northern Alberta, residents of Fort McMurray spoke of the town as if it was on steroids, with emergency rooms crowded
with people from other provinces (Dorow and O'Shaughnessy, 2013). These sudden increases in economic activity also place pressure on social and economic infrastructure, resulting in shortages in affordable accommodation, housing, skills training and trades, difficulty in retaining staff in non-mining sectors (Cameron et al, 2014), and pressure on community services such as childcare, employment, and medical and dental services (Rolfe et al., 2007; Franks et al, 2010).

2.2 Aboriginal Peoples and Potential Benefits and Impacts from LNG

2.2.1 Indigenous Colonization in Canada and Historical Context

When lands of First Nations Peoples in B.C. were colonized by European settlers, it was never agreed that their lands would be taken away from them. Whether one refers to the process as peaceable subordination (Lutz, 2008; Tennant, 1982) or cultural genocide (Gagne, 1998; Dean, 2000), it is a wrong that is still getting resolved through legal treaty negotiations and other initiatives. Paul Tennant (1982), in his book investigating internal colonialism of First Nations in B.C., wrote how native leaders began protesting in 1887 against the Crown taking over their land, when the Nisga’a resisted attempts to have their land surveyed. The Nisga’a Land Committee formed in 1908, which was the first B.C. Indigenous political organization, followed by the Indian Tribes of B.C. and the Interior Tribes of B.C. in 1909, and then the Allied Indian Tribes of B.C. in 1916. The sole purpose of these organizations was to pursue the issue of Aboriginal land claims, which was then followed by the formation of other groups in recent years which were also intent on resolving the same issue (Tennant, 1982).

Colonization of the Americas, Australia and New Zealand (otherwise termed the New World) was unlike conquered peoples in Europe, Asia and Africa. Aside from war, people’s physical and cultural survival needs in the Old World were protected, as their populations were not like that of a minority group. In other words, people of the same culture were present elsewhere in the world and could be called upon for moral support, maintenance of the political system of the group, and cultural protection (Tennant, 1982). For Indigenous Peoples in the New World, the experience was much different. In Canada, Indigenous Peoples were required to assimilate and integrate per different Federal and Provincial laws and policies. As Indian Affairs Deputy Minister Duncan Campbell Scott
has stated, Indigenous Peoples in Canada were forced into the body politic of the colonial powers until no ‘Indian’ identity remained (Truth and Reconciliation, 2015).

The Indian residential school system was a failed attempt to assimilate and integrate Aboriginal Peoples in B.C. and Canada, and resulted in negative intergenerational social effects, which culminated in hindering the ability of Indigenous Peoples to regain their independence. The first Aboriginal boarding school in Canada opened in 1620 in New France to transform Aboriginal Peoples. In B.C., 18 residential schools operated between 1861 and 1984, with the majority in the southeast portion of the province (De Leeuw, 2007). In 1894, although attendance to a residential school was voluntary, an Indian agent or justice of the peace could issue an order to have a child between 6 and 16 yrs. old be placed in a school if he thought that he or she was not being properly educated at home by the parents (Truth and Reconciliation, 2015).

The Federal Indian Act, first adopted in 1876, defined who was of Indian status and how status could be lost. Several amendments over the years were made to strengthen the effort to assimilate and force Indigenous Peoples to give up their status and culture. Some of these efforts are described in Table 2 (Manzano-Munguia, 2011).

A transition from residential schools to orphanages began in the 1940’s and by 1960 50% of the children in residential schools were there for child welfare reasons (Truth and Reconciliation Commission, 2015). Children were then apprehended from their families during the sixties, termed as the Sixties Scoop and placed into the social care system (MacDonald and Hudson, 2012).

Besides the physical and sexual abuse that occurred with children who were taken from their homes, children were stripped of their native clothing, given a number for a name which they displayed as they walked around, separated from their siblings, thrown into a world of domination, fear, loneliness and lack of affection (De Leeuw, 2007; Truth and Reconciliation, 2015), and were put to work under often dangerous and unsupervised circumstances in these residential schools (Truth and Reconciliation, 2015). In addition, the food provided to them was inadequate and with little nutritional benefit (Truth and Reconciliation, 2015).
Table 2. Description of Canadian Federal Indian and Enfranchise Acts/Amendments

<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1867 (Indian Act)</td>
<td>State is the ultimate ward and decision maker about all Indian issues: management and protection of lands; money; and natural resources. Not entitled to privileges of full citizenship like voting, property holding, selling the product of their labour, and investing. Consumption and sale of liquor on all reserves banned. An Indian man or unmarried woman at 21 years or older can become enfranchised with consent of the band (voluntarily give up Indian status)</td>
</tr>
<tr>
<td>1869 (Enfranchisement Act)</td>
<td>Voluntarily surrender Indian status to acquire private property, social status (become priest, lawyer, or doctor) and right to purchase liquor. Democratise band governments to Prepare indigenous people for ‘civilisation’ by adopting the election system. Identify who is legally Indian through lineage.</td>
</tr>
<tr>
<td>1869</td>
<td></td>
</tr>
<tr>
<td>1869</td>
<td></td>
</tr>
<tr>
<td>1927</td>
<td></td>
</tr>
<tr>
<td>1927</td>
<td></td>
</tr>
<tr>
<td>1951</td>
<td>Deleted fifty sections and subsections relating to cultural bans and freedoms as they were too aggressive, such as prohibitions against alcohol, fund raising to pursue land claims, allowing woman to vote.</td>
</tr>
<tr>
<td>1985 – Bill C-31</td>
<td>Recognition of registered Indians, including woman who marry non-Indians. Children, to be registered must be the descendant of two registered Indian parents.</td>
</tr>
<tr>
<td>2010 – Bill C-3</td>
<td>Re-instated registration for woman who lost their status and their children who lost their status from marriage to a non-Indian.</td>
</tr>
</tbody>
</table>

Source: Manzano-Munguia, 2011

The legacy of colonialism within the residential school system is inter-generational and has affected entire communities (Gagne, 1998). Many children who were subjected to the physical, emotional and mental abuse, combined with the loss of their family structure and culture, have had difficulty coping as adults. In many cases abused children then went on to abuse others when they themselves became adults, while others became drug addicts or alcoholics, and some turned to crime. Due to the institutionalization, many were not provided with the love from their parents as children, culminating in them not knowing how to love their own children (Truth and Reconciliation, 2015).

Poverty has been another major impact caused by the residential school experience, the Sixties Scoop and effects of the Indian Act legislation over the years. Poverty has been linked to increased substance abuse, illness and disability, which in turn has reduced opportunities for productive employment (Reading and Wien, 2009).
2.2.2 Socio-economic Conditions of Aboriginal Peoples in Canada

Aboriginal Affairs and Northern Development Canada (AANDC, 2016a) applied the Community Well-being Index (CWB) to measure socio-economic well-being of First Nations, Inuit and non-Aboriginal communities in Canada between 1981 and 2011. The CWB uses Statistics Canada Census of Population and the National Household Survey to measure income, education, housing, and labour force activity. A CWB score can be as low as 0 to a maximum of 100. The results showed that the disparity in income between First Nations and non-Aboriginal communities remained the same as did educational attainment in terms of graduation from high school or higher levels of education. The housing score narrowed slightly between 1981 and 2011 between First Nations and non-Aboriginal groups. Factoring in all the indicators, the average CWB for non-Aboriginals was 79, while for First Nations communities it was 59 (AANDC, 2016a).

The 2011 Aboriginal Affairs and Northern Development Canada (AANDC, 2011) report on socio-economic measures also confirmed that Aboriginals are the most disadvantaged group in Canada, especially in terms of income (Pendakur and Pendakur, 2011). Aboriginals who live on-reserves generally comprise the lowest 10% of differential earnings, which only reinforces the income gap between Canadian Aboriginal and non-Aboriginal people (Lamb, 2013). Furthermore, the Federal Government continues to provide inequitable funding to First Nations for basic social services, resulting in continual poverty (Palmater, 2011).

Canada without Poverty and Citizens for Public Justice has reported in their National Anti-Poverty Plan for Canada (2015) through their Dignity for All campaign utilizing low-income measures identified by Statistics Canada (Table 3), that while 1 in 7 Canadians live in poverty, 25% of Aboriginal Peoples do not have adequate sustenance, with almost half of the poor (46%) being food insecure. British Columbia is the only province in Canada without a poverty reduction plan, while at the same time presenting the highest child poverty rates in the country and having had reduced social programs the most out of all provinces in recent years (Cohen and Klein, 2011). The number of Aboriginal children in poverty (40%) is more than twice the rate of non-Aboriginal children (17%) (Macdonald and Wilson, 2013).
Table 3. Low-income measures threshold for Canadian households for 2010.

<table>
<thead>
<tr>
<th>Household Size</th>
<th>Before-tax income ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 person</td>
<td>22,160</td>
</tr>
<tr>
<td>2 persons</td>
<td>31,339</td>
</tr>
<tr>
<td>3 persons</td>
<td>38,382</td>
</tr>
<tr>
<td>4 persons</td>
<td>44,320</td>
</tr>
<tr>
<td>5 persons</td>
<td>49,451</td>
</tr>
<tr>
<td>6 persons</td>
<td>54,281</td>
</tr>
<tr>
<td>7 persons</td>
<td>58,630</td>
</tr>
</tbody>
</table>

Source: Statistics Canada, 2011a

Individual or community poverty was addressed through a system of sharing among family groups and between neighbouring Nations. For thousands of years in northwest B.C., First Nations Peoples shared resources within their families and with other Nations through the potlatch system. When salmon abundance was low within a family’s harvest area or Nation’s Territory, they would rely on others for food resources and reciprocate when the situation was reversed. Also, when faced with a decline in salmon abundance, they had the ability to self-organize and selectively fish to maintain the runs for future years. Social learning was another important aspect of the culture, where respect for food, nature and each other was taught from one generation to the next (Trosper, 2003). Due to colonization and the demoralization that occurred with their culture, many First Nations have lost their traditional knowledge and resilience to rise above hardship. Combined with abject poverty, First Nations communities are vulnerable to the negative impacts of resource development, while at the same time being unprepared and unable to take full advantage of the jobs, training and educational opportunities that come with these kinds of projects.

2.2.3 Indigenous Communities and Resource Development

Colonization has resulted in racism and social exclusion that is still prevalent today in Canadian society (Truth and Reconciliation, 2015). It began with the notion that the Europeans were a superior race when they first colonized and implemented the assimilation and integration policies. These policies were ultimately unsuccessful, creating a situation where many Aboriginal Peoples became dependent upon the Federal Government to provide them with sustenance. Furthermore, this dependence continues
today as a remnant of the Indian Act, but also due to the diminishing natural resources available to live off the land and provide for their people as they did before colonization.

Although with colonization, B.C. First Nations worked in all economic sectors including forestry, fishing and mining, Aboriginal Peoples were legally excluded from the same participation in the resource development economy as their colonizers were afforded (Lutz, 2008). This inability to participate in the economy as business owners combined with the loss of wage labour work as B.C. became more populated with Europeans looking for work (Lutz, 2008), has contributed to the disparity in education and income levels observed today between Aboriginal and non-Aboriginal Peoples.

For most B.C. First Nations groups, despite progress with settling treaties, the establishment of self governance and court rulings strengthening Aboriginal rights and title claims, the Federal Government continues to dictate through the transfer of government funds to reserves, how and where money is spent on housing for status Indians, and for health, education/training and social issues. Additionally, the Provincial and Federal Governments continue to make resource extraction decisions, which in some cases result in reduced ability for Aboriginal Peoples to access their traditional foods (Truth and Reconciliation, 2015).

2.2.4 Potential Impacts to Traditional Foods and Use Areas

The National Collaborating Centre for Aboriginal Health (2011) recognizes the importance of traditional foods for First Nations communities, acknowledging the fact that numerous studies have demonstrated that traditional indigenous diets are rich in sources of omega-3 fatty acids and provide more vitamins and minerals than modern diets. Furthermore, the National Collaborating Centre for Aboriginal Health published an eight-page brochure describing the importance of traditional foods to First Nations health and culture, including aspects of sharing and cooperation. Ensuring that traditional foods are available now and for future generations is very important for the health and cultural well-being of Aboriginal Peoples.
It is clear that potential impacts to continued access to traditional foods and use areas are directly related to the socio-economic status of First Nations, as many members continue to rely on the land and water to harvest for sustenance and cultural uses.

2.2.5 What can the Extractives Industries offer First Nations?

With development comes impacts and benefits. The LNG sector plans to minimize impacts and maximize benefits to obtain the necessary approvals from government regulators and to earn a social license from the local and regional populations. The intent is to implement mitigation measures to minimize negative impacts to the land, air and water while monitoring social effects, and enhance benefits such as training, employment initiatives, business development assistance, and social investment programs.

One of the most important benefits First Nations have the potential to realize, depending on their strength of claim, is what are now most often called Impact Benefit Agreements (IBAs). These agreements are made between the proponents of a proposed development or activity and the Aboriginal group who are potentially affected by the project. The purpose of these agreements is to garner support for the project and provide compensation for negative effects that are not able to be mitigated. IBAs usually contain provisions for employment, economic and business development, royalties, profit sharing or fixed cash amounts and equity interests, environmental protection and social/cultural programs, community infrastructure and recreational activities (Kieland, 2015).

Negotiating an IBA can be challenging, especially if the expectations differ significantly between the two parties. It is useful to understand how to proceed through the negotiations and be familiar with what is normally included in IBAs by consulting other publicly available negotiated agreements and toolkits, such as the IBA Community Toolkit, developed by Gibson and O’Faircheallaigh (2010). Although case law has advanced the negotiating power of Aboriginal groups since this Toolkit was developed, it still has value in its clearly identified steps of the IBA negotiation process.

Another type of resource development agreement is also negotiated with the Provincial Government, as per the Resource Revenue-Sharing Policy developed in 2008 by the Ministry of Energy, Mines and Petroleum Resources (MEMPR, 2008). Revenue-
sharing agreements are negotiated between the Province and those Aboriginal groups claiming territory in areas of new resource development (Heisler and Markey, 2014). For the LNG industry in B.C., these agreements between First Nations and the Provincial Government are called Community Development Agreements (CDAs).

### 2.3 Governance

Governance has a complex definition compared to leadership and management. Governance is defined by the United Nations Development Program (UNDP), the World Bank and the OECD Development Assistance Committee (DAC) as “the exercise of authority or power in order to manage a country’s economic, political and administrative affairs” (UNESCO, 2016). Good leadership is important for good governance as defined by Forbes (2013), “a process of social influence, which maximizes the efforts of others, towards the achievement of a goal”. Management, through designated individuals, is the concept of achieving desired results by utilizing physical, human and financial resources (UNESCO, 2016). Although this definition of governance refers to a country’s affairs, this definition of governance can also apply to First Nations, corporations and provincial/federal governments in Canada. Furthermore, while much governance discourse focuses on “leadership” in First Nations communities, it is absolutely critical that such discussion consider the constraints and opportunities related to the governance conditions in which local leaders operate.

#### 2.3.1 First Nations Governance

**Government Structure**

The Harvard Project on American Indian Economic Development has been researching “What Works, Where and Why?” since 1987 (HPAIED, 2017). One of the key findings is leadership matters because Nation building requires leaders to convince people to take action in their own lives based on new knowledge and experiences, while challenging assumptions and proposing change. The research conducted by HPAIED has shown leadership to be an essential element to good governance and good governance is a pre-condition for long-term sustainability in First Nations communities.
Whether the leadership of a First Nation in B.C. is elected or hereditary chiefs, these individuals are the governing body for the membership.

B.C. First Nations leadership at the hereditary chief level is inherited through family lineages. Before European contact, the male in line to inherit title of a portion of the Nation’s territory, was obligated to provide gifts to other title holders at a potlatch feast and these gifts could be rejected if the other title holders felt the first male in line to become the hereditary chief was not a good choice (Trosper, 2003). Today, there is confusion within some Nations on the process associated with the assignment of hereditary chief status as colonization effects have resulted in the loss of knowledge of the traditional governance system. However, some Nations have managed to maintain the knowledge and their hereditary system is strong and effective, while others are working towards reinstating fully their traditional knowledge and use information.

In regard to elected First Nation representatives, Chief councillors and councillors' elections are held every two years. Some First Nations in B.C. are solely governed by their elected leaders and some are governed partially by their hereditary chief system. Decisions are made by the councillors or hereditary chiefs on behalf of their band membership as rights and title to the respective traditional territories are held collectively by the members (AANDC, 2016a).

Registration as a status Indian and the rights that flow from registration is controlled by the Federal Government, however the 1985 amendments to the Indian Act, Bill C-31 not only re-instated woman and children’s status previously lost due to marriage to a non-status Indian, also increased each band’s autonomy to maintain its own membership list. A general requirement by the Federal Government is for a child to have at least two grandparents who are entitled to be registered. A band membership requirement may be of four types: 1) one-parent descent rule; 2) two-parent descent rule; 3) blood quantum rule, based on percent Indian blood, e.g. 50%; and 4) Indian Act rules, sections 6(1) and 6(2) (Furi and Wherrett, 2003).
The mandate of Indigenous and Northern Affairs Canada (INAC\(^5\)) as stated on their website (AANDC, 2016a), is to support Aboriginal Peoples in social and economic prosperity, support efforts to improve the health and sustainability of communities, and increase their participation in Canada’s political, social and economic development activities. This mandate is carried out within the purview of Canadian Constitution (1867; patriated from the United Kingdom in 1982), Department of Indian Affairs and Northern Development (R.S.C., 1985, c.I-6), Indian Act (R.S.C., 1985, c. I-5), and in B.C. the statutes dealing with resource management are the First Nations Land Management Act (S.C. 1999, c. 24), First Nations Fiscal Management Act (S.C. 2005, c.9), First Nations Jurisdiction over Education in British Columbia Act (S.C. 2006, c. 10), Family Homes on-reserves and Matrimonial Interests or Rights Act (S.C. 2013, c. 20), First Nations Financial Transparency Act (S.C. 2013, c.7), and Safe Drinking Water for First Nations Act (S.C. 2013, c.21) (AANDC, 2016a).

The right to self-governance was formally recognized by the Federal Government in 1995 with the implementation of the Inherent Right Policy. An important feature of this policy is the recognition each community may develop their own form of self-government dependant upon their unique historical, cultural, political and economic circumstances (AANDC, 2016a).

Governance structures in First Nations communities throughout Canada today range from minimal to self-government agreements. Since 1995, seventeen self-governance agreements have been signed in Canada (AANDC, 2016a). The Federal Government supports communities to improve their governance by negotiating and implementing agreements, providing funding for core operations, amending relevant laws and regulations, and building cooperative relationships through treaties. In addition, tools and resources are provided on the Federal Government website to assist in planning and implementation. The Governance Capacity Planning Tool (AADNC, 2016) assists communities in developing their own core functions as government, which include: leadership; membership; planning and risk assessment; community involvement; law-

\(^5\) INAC and AANDC are the same Federal Ministry; name has changed with change in Government
making; fiscal management; human resource management; information management and information technology; external relations; and basic administration.

Administratively, planning processes are underway to move towards self-government. The Comprehensive Community Planning process funded by the Federal Government facilitates community input to the Nation for future governance, land and resource use, health services, infrastructure development, culture, and social and economic development, before being endorsed by the leadership (AANDC, 2016a). The results from this process then contribute to land use planning and eventual governance of IR lands.

The Land Code development process is another step towards self governance for First Nations IR lands. A land use plan is developed through engagement with the community and is ratified by the community before the Land Code is adopted. Once adopted the band can make laws pertaining to the land and INAC no longer has jurisdiction over land use decisions on the band’s IRs.

The Modern Treaty

In Canada, although eleven treaties were signed between 1871 and 1921, most Indigenous groups in B.C. still remain without signed treaties (AANDC, 2016a). However, three treaties have been signed in B.C. in recent years, including the Nisga’a Nation from northern B.C. in 2000, the Tsawwassen First Nation from the Lower Mainland in 2000, and the Maa-nulth First Nation from Vancouver Island in 2011 (AANDC, 2016a). The Modern Treaty process in B.C. also involves the Federal Government and it is managed through the B.C. Treaty process established in 1992. Currently, several other First Nations bands are at various stages within the treaty process. Most treaty discussions include topics related to financial compensation, lands, self-government, fiscal relations, taxation, natural resources, environmental concerns, ratification and implementation, and certainty. The Federal Government is actively working with bands who are in the treaty process to move towards self-government (AADNC, 2016a). To participate in the treaty process, a band acquires debt over time, and average loans per treaty table reach approximately $10 million (Eyford, 2015, in Rosenberg and Dickson, 2016).
Rights, Title and Strength of Claim

The Royal Proclamation in 1763 set the stage for the outcome of many B.C. Aboriginal court cases, whereby King George III declared that the land inhabited by several Nations or Tribes of Indians was unceded territory, and first Peoples were not to be “molested or disturbed” (Indigenous Foundations, 2017). The Proclamation also provided rules for the purchase of lands from natives, by which the eleven treaties previously cited were signed (Indigenous Foundations, 2017).

The Constitution Act of 1982 affirmed the recognition of Aboriginal and treaty rights; however, it did not specifically define what the Aboriginal rights were (Borrows, 1998). Aboriginal rights and title were further defined by the courts following the implementation of the Act. Court cases that contributed significantly to further definition of Aboriginal rights and title include the Calder v. Attorney General of British Columbia in 1973, Delgamuukw v. British Columbia, 1997 and Tsilhqot’in Nation v. British Columbia in 2014. The Calder case resulted in the land question being dealt with by the Comprehensive Land Claims process set up by the Federal Government (Indigenous Foundations, 2017). In comparison, the Delgamuukw case resulted in definition of Aboriginal title, where it was deemed that an Aboriginal group must have occupied the land prior to 1867 (sovereignty) in order to qualify. Proof of occupation must be provided, and occupation must be continuous and exclusive (Indigenous Foundations, 2017). Finally, the Tsilhqot’in won their case and it was not only the first-time Aboriginal title was recognized and affirmed by the Supreme Court, but also that title was given in a territorial context (Rosenberg and Woodward, 2015).

The five-year Tsilhqot’in v. British Columbia trial included a statement about the requirement for the Crown to consult with Aboriginal groups who have asserted title in an area proposed for development; their strength of claim, and the seriousness of the claim then determines the level of consultation and accommodation required. In addition, after title is established by court declaration or agreement, consent is required by the Aboriginal group prior to development, unless the Crown discharges its duty to consult and can

---

6 The comprehensive lands claims process is now a component of the modern treaty negotiations and was set up by the Federal Government in 1973
justify the intrusion on title. Therefore, based on these court decisions to date, consent is not required by the Aboriginal group asserting title until it is declared in court or by agreement (Rosenberg and Woodward, 2015).

The depth of consultation and accommodation required by the Crown for a project or activity that may impact rights and title for a First Nations group is dependent upon the strength of claim. The strength of claim therefore dictates the power a Nation has to negotiate and receive benefits from a development (Wynberg and Hauck, 2014). Often the procedural aspects of consultation are delegated by the Crown to proponents as defined by the Supreme Court of Canada in the Haida decision (2004). Although the B.C. Government has produced several consultation guides for navigating the process, many First Nations continue to be left out of the decision-making process (Rosenberg and Dickson, 2016). In addition, the Crown conducts its own review of strength of claim, which may or may not include all the evidence of rights and title.

Despite the requirement for consultation and accommodation, the Crown continues to be the decision-making government body on whether a project receives approval (Bowie, 2013; Rosenberg and Dickson, 2016). Canada is now a signatory to the United Nations Declaration of Indigenous Peoples (UNDIP), which requires the free, prior and informed consent (FPIC) from Indigenous Peoples before any project within their respective territories can be approved. However, Article 28 of the Declaration states that if FPIC has not been given, "just, fair and equitable compensation" is required, and according to Coates and Favel (2016), the short answer is adoption of the Declaration does not give Aboriginal Peoples a veto for projects. As an alternative, Boutilier (2017) suggests revisiting the idea of a House of First Peoples as suggested in the Royal Commission on Aboriginal Peoples' report (1996) as a mechanism to address FPIC. This body representing Aboriginal Peoples in Canada would reside within the Federal government and advise Parliament on Aboriginal issues (Boutilier, 2017).

Beyond Canada, Indigenous Peoples continue to be subjected to resource extraction decision making that has the potential to impact their culture and way of life significantly while providing few benefits (Anaya, 2015). However, in North America, some Aboriginal Peoples are forming companies to extract resources from their traditional
territories while others are forming partnerships with non-Aboriginal companies with ownership to be acquired over time (Anaya, 2015).

**Managing Revenues**

INAC funding is restrictive\(^7\) in terms of how much money is to be spent on a particular service administrated by the band (S. Roberts, personal communication, March 27, 2017). Historically, there has been no need to develop economic policies. With revenue streams from agreements and successful business ventures, bands are now required to make investment and social spending decisions on behalf of its membership.

A fiscal economic policy provides for better planning and management of funds acquired from various revenue sources. Key considerations when developing a fiscal economic policy include how benefits will be distributed across generations, within the Nation, whether foreign investments should be considered, managing volatility of the revenue streams, growing the local economy, and managing expectations (NRGI, 2015a).

To avoid negative economic effects to Nations, as has occurred in many countries from the cyclical nature of the extractives industry (Arezki et al, 2011), several African countries have enacted laws to manage petroleum resource revenues including Ghana. However, for Ghana these laws did not operationalize at the management level successfully and provide long-term benefits for the country (Lwabukuna, 2016). Despite the extensive research by Ghana of other countries who successfully implemented revenue management acts, and the detailed regulations formed under the Act, a promise made to the public to utilize petroleum revenues for improved socioeconomic conditions resulted in increased borrowing and spending, and when oil prices declined, decreased revenues, moved Ghana into an economic crisis (Lwabukuna, 2016).

Some countries have managed their resource development revenues well in terms of increasing GDP per person like Botswana, however the disparity in quality of life between the “haves” and the “have nots” has increased and there has been little progress with economic diversification (International Monetary Fund, 2012 in NRGI 2015a). These

\(^7\) INAC funding is less restrictive if Bands receive block funding, or are self-governing
results do not bode well for a sustainable future. Other authors however claim Botswana through its fiscal policy evenly distributed benefits increasing access to education and health services significantly (Dougherty, 2011).

Closer to B.C., Canada, in Alberta the Alberta’s Heritage Savings Trust Fund established in 1976 was set up to collect revenues from non-renewable resource development for the purposes of saving for the future, strengthen or diversify the economy and improve the quality of life for people living in the province. The Fund is smaller than similar funds set up in Alaska since: funds are not required to be deposited; and withdraws have been significant leaving very little equity in the fund over time. Comparing Alberta with Alaska’s fund, Alberta in 2011 held $14.2 billion, whereas Alaska held $41.6 billion (Murphy and Clemens, 2013). Given the recent downturn in the Alberta oil industry people have been experiencing a bust due to a lack of individual preparedness for a potential job loss compounded with little relief from this fund to the extent that it was reported in the media suicide rates had climbed by 30% in the first six months of 2015 (CBC, 2015a).

Resource Management Policies

Some First Nations have developed resource management policies for companies and government to adhere to while exploring and operating within the respective territories. After the Mount Polley mine tailings dam failure in August 2014 close to Williams Lake, B.C., the Northern Secwepemc Qelmucw Leadership Council representing four First Nations encompassing the Mount Polley mine area developed a Mining Policy dated November 19, 2014. The policy has 13 parts and includes guiding principles, decision-making processes, agreements with proponents, environmental assessment, permitting and approvals, all phases of mine development including enforcement, security, crisis management planning and dispute resolution. In April 2016, a news article outlined the desire for B.C. communities to enact a water policy using traditional laws (APTN, 2016). The elected leadership from Nadleh Whut’en and Stellat’en First Nations proclaimed the water management regime as law within their territory and noted the decision resulted from their opposition to the Northern Gateway pipeline proposed project (ibid). Resource management policies are necessary to protect the need
to access traditional ocean and freshwater resources in perpetuity, as described in Section 4.3.

2.3.2 Corporate Governance

Currently, the oil and gas industry has a high-risk exposure to opposition from indigenous communities or violations of indigenous rights, as demonstrated by a study of 330 extractive industry projects worldwide, where one important reason included the lack of commitment by industry to Free Prior and Informed Consent through its industry association (First Peoples Worldwide, 2014). The willingness for industry to work with First Nations from the assessment stage through to post closure to maximize benefits and minimize impacts and obtain/maintain a social license to operate makes good business sense, as delays or cancellation of the project are minimized if potentially-affected people are supportive of the project over time (Henisz et al, 2013).

According to CSRHub (2017), using a scale of 0 to 100, where 100 is the best socially responsible corporation, Petronas (majority shareholder in PNW LNG) was given a corporate social responsibility rating of 54, while Royal Dutch Shell (majority shareholder in LNG Canada) was rated 59.

During the environmental assessment process in northwest B.C. from 2013 to 2016, PNW LNG and LNG Canada established Aboriginal consultation teams, who were technical staff or consultants, and a negotiation team. Negotiations were most often conducted involving Chiefs, their staff and consultants and more senior people from the LNG company, including the Vice President. Funding is normally provided by the LNG companies to potentially affected First Nations to conduct traditional use and socio-economic studies and to participate in the procedural aspects of consultation. Additionally, paid participation in environmental studies and training dollars were also provided. On the other side, B.C. and Federal Governments provide advice to the LNG companies on the required level of consultation and negotiation for each Nation.

2.3.3 Federal and Provincial Governance

The Canadian Environmental Assessment Agency (CEAA) and the B.C. Environmental Assessment Office (BCEAO) are the Federal and Provincial Government
agencies who administrate the EA process for large resource development projects in B.C. Because these projects have the potential to infringe on Aboriginal rights and title, a strength of claim assessment must be conducted to determine which First Nation(s) have strong claim to the project affected area. This in turn determines the depth of consultation and the level of accommodation or compensation for impacts required to mitigate against any infringement on a particular Nation’s rights and title. The procedural aspects of consultation are delegated to proponents early in the EA process through a Section 11 Order that also defines the level of consultation required for each potentially affected Aboriginal group, the scope, procedures and methods of the assessment. Accommodation or compensation is often provided by both the Province of B.C. and the proponent of the project through Community Development Agreements (CDAs) and Impact Benefit Agreements (IBAs) respectively.

Although several Aboriginal consultation guides have been produced by the Federal and Provincial governments, many Aboriginal groups with strong title claims continue to be left out of the decision-making process (Rosenberg and Dickson, 2016). The Crown’s determination of a First Nations’ strength of claim may or may not include all the evidence regarding rights and title, which could result in a lack of sufficient consultation and engagement. For example, the recommended decision from the BCEAO to approve the PNW LNG project on November 5th, 2014 was submitted to the Minister of Environment prior to reviewing the submission by Kitsumkalum First Nation on October 24, 2014 regarding evidence of occupation and use of the Prince Rupert harbor area by Wolfhard (2014). Although the BCEAO admitted they had missed the submission by Kitsumkalum before referring the project approval to the Minister, the strength of claim was not modified to account for the new information Kitsumkalum had produced with justification given by BCEAO that in-depth consultation had occurred with Kitsumklaum despite the weak to moderate strength of claim assessment. This strength of claim assessment however is considered during the IBA negotiations with government and corporate entities for the PNW LNG project and potentially subsequent large development proposals in the Prince Rupert area.
Programs and services provided on-reserve are funded by the Federal Government, while programs and services for off-reserve status Indians are provided by the Provincial Government. An off-reserve protocol agreement was signed in 2014 between the Province of B.C. and the B.C. Association of Aboriginal Friendship Centres to and advance skills training and employment for the 60% of B.C.’s Aboriginal Peoples who live in urban areas (Province of B.C. and B.C. Association of Aboriginal Friendship Centres Protocol Agreement, 2014). Similar to other programs and services provided by both the two Governments where education, training, employment, access to affordable housing and family and health care services are the focus (AANDC, 2016b), there are no resources allocated to socio-economic issues for Aboriginal Peoples such as addictions. Also absent are programs to reconnect off-reserve members with on-reserve members.

2.3.4 Collaborative Governance

While First Nations governments, leadership and managers are responsible for fulfilling their duties to bring their Aboriginal communities together and work towards long-term sustainability, it is imperative collaboration and cooperation occurs between the federal and provincial governments, and industry. These collaborations are often needed at various scales from decision makers to workers at the service provider level. One example of the initiation of a collaboration is between the First Nations Northern Health Authority and the Northern Health Authority in B.C. Through a Tripartite Framework between the federal, provincial and First Nations governments, this partnership was established to manage the healthcare system in B.C. so it can be tailored to the specific needs of First Nations in B.C. The partnership is in its infancy and has much work to do but the hope is with this collaboration, healthcare for First Nations should improve over time.

The federal and provincial environmental impact assessment process in B.C. does not provide for the development of a collaborative working relationship since these two governments lead the process, and industry conducts the studies. Aboriginal Peoples in Canada are consulted on aspects of a Project that may impact their Aboriginal rights and title, as determined by a strength of claim assessment. Often the effects to Aboriginal rights and title are linked to the impact assessment on the aquatic and terrestrial
environments and are deemed insignificant. Despite scenarios in Canada where co-management of resource use is established between governments and Aboriginal Peoples, traditional ecological knowledge may be considered, but ultimately the decision making still rests with the government, and state interests of land development continue to be fulfilled (Bowie, 2013). In regards to effects that cannot be mitigated such as access to traditional use areas or impacts to spiritual sites, the status quo is to negotiate agreements. If a Nation is opposed to a Project and has been consulted at a reasonable depth of consultation and it is meaningful consultation, the only recourse is court action. Court action has been and will continue to be the mode of response for Aboriginals in B.C. who are not in favour of a project. Despite these issues, it is imperative the governments, Aboriginal groups and industry work together if a project is approved to maximize benefits and minimize impacts during the boom and bust phases, even if a financial investment decision has not been made.

Sometimes politics can be a barrier to collaboration. The debate over who owns the resource and the land in B.C. between First Nations and the Crown has been ongoing since colonization although not public until the early 1900s when Aboriginal groups formed alliances to assert their title and rights (Tennant, 1982). An additional layer is the claimed territory by the Nations within B.C. and the overlap issues and strength of claim to a certain geographic area. These important unresolved issues and the political posturing that can occur to assert a Nation’s rights and title to another Nation or the government and the government in turn asserting its rights to resource development decision making can hinder the important work of managing scarce resources to work towards sustainable First Nations communities. Sometimes it is best to put aside these differences and focus on what Aboriginal Peoples need to improve their overall standard of living and work collaboratively to seize the opportunities resource development projects can offer to achieve this goal.

The establishment of multi-stakeholder groups to monitor key indicators although challenging, is considered by some researchers to be essential in managing cumulative effects (Franks et al, 2010; Uhlmann et al, 2014; Boutilier and Black, 2013). Porter et al (2013) through a review of 30 case studies of collaborative governance recognized the
most prevalent challenge was participants not owning up to their contribution to the impacts. In addition, the sharing of information to effectively monitor effects means each individual contributor to the effect must give up some control resulting in some stakeholders not willing to collaborate. When setting up such a collaboration it will be important to research other organizations’ experiences and implement lessons learned in the process. Regardless of the challenges the benefits have included better resource utilization and enhanced innovation and creativity through a multi disciplinary group, where long-term solutions to problems can be found (Porter et al, 2013).

From 2014 to 2016 the Tsimshian Education and Training Roundtable, comprised of potentially affected First Nations, government and LNG company representatives, met regularly to talk about how regional First Nations in northern B.C. could participate in LNG related jobs. In addition, an LNG Alliance initiated by the B.C. Premier has been meeting regularly since 2014 to address labour force issues among other B.C. LNG related issues. The effectiveness of the work these two groups are engaged in can only be evaluated in the future by monitoring the socioeconomic conditions of each First Nation living in the region on and off-reserve over time.

For those proponents who have received their environmental assessment approvals, social management plans have been drafted however they are limited in scope and are general in their approach to mitigation, management and monitoring of socioeconomic effects resulting from the project. They also do not address cumulative effects likely to occur if other developments proceed at the same time. Unfortunately, due to the uncertainty of whether the projects will go ahead and when, the progression of management planning and the idea of collaboration is in its infancy. This presents a problem because once an investment decision is made, the project will move into construction very quickly and the detailed planning to mitigate, monitor and adaptively manage any environmental or social effects will be developed quickly without meaningful input of Aboriginal Peoples and other interested parties.

Although significant work is in progress through various governments and governing bodies to improve the employment status of First Nations Peoples in northwest
B.C., more planning and collaboration/cooperation is needed to prepare for a final investment decision by one of the many proposed LNG projects in the region.

2.4 Sustainable Development

Sustainable development often considers three aspects of sustainability: environmental; economic and social. John Elkington, a world authority on corporate responsibility and sustainability, coined the phrase “triple bottom line” in 1994 to provide a framework that companies could use to measure social and environmental responsibility, as well as profits (Elkington, 2013). Since then, numerous analyses of what sustainable development means and how to implement or contribute to it has been conducted by many organizations.

Utilizing the most commonly used definition of sustainable development, which is to "meet the needs of the present without compromising the ability of future generations to meet their own needs" 


Utilizing the most commonly used definition of sustainable development, which is to "meet the needs of the present without compromising the ability of future generations to meet their own needs" 9, it initially appears to be mainly an environmental issue, although the Bruntland Report, *Our Common Future*, where this definition originated from, identified meeting the needs of the world’s poor as the overwhelming priority (WCED, 1987). Despite this, a significant amount of investigation has been conducted to try to understand and address environmental sustainability issues. More recently, two other components of sustainability have been considered. While economic sustainability can be defined as satisfying the needs and wants of individual humans and at the same time ensuring that scarce resources are used efficiently to protect the rights of future generations and life on earth, social sustainability is difficult to examine at the community level.

Economic sustainability, on an individual business scale, has been defined by Small Biz Connect, a program funded by the New South Wales Government in Australia, as the ability to deliver products and/or services to market at a price that covers expenses, generates a profit, and prioritizes long-term profitability over short-term goals (Small Biz

---

8 Sometimes sustainable development includes governance as an important aspect, especially in developing countries (UNDP, 2014).
Connect, 2015). Just as businesses need markets with long-term viability to sell their services or products, resource extraction companies rely on newly discovered deposits and good commodity prices to survive. However, communities who rely on the extraction of natural resources for their livelihoods are economically vulnerable to the on-going availability of the resource and the demand for these resources worldwide. Therefore, economic sustainability can be challenging in resource-dependent towns, where a significant part of the economy and income generation depends on the viability of a local mine, mill or plant.

Vallance et al (2011), in a quest to define social sustainability, researched the term and developed their own definition comprised of three parts: development; bridge; and maintenance social sustainability. Development social sustainability, although applicable mainly to developing countries, is a concept where meeting people’s needs everywhere is required for development goals. This idea suggests that if basic needs such as potable water, healthy food, medication, and adequate housing are met, then education, employment, equity and justice will follow. Beyond meeting these goals, protection and conservation of the environment would also be a further progression of social sustainability. Bridge social sustainability is described as a condition where social conditions are such that they support ecological sustainability. Vallance et al. (2011) describes maintenance social sustainability as a condition where people would like to have their traditions, cultures and way of life preserved, which includes satisfying social networks, pleasant work and living spaces, leisure opportunities and other aspects of daily life. For Indigenous people in northwest B.C., this three-part definition may not apply in the suggested order. With a strong connection to culture, traditional knowledge and use of the land and water, Indigenous people living in rural and relatively remote areas like northwest B.C. are faced with the challenge of becoming socially sustainable by developing, bridging and maintaining all at the same time.

Veiga et al (2001) discussed how a mining community can become sustainable based on a concept of sharing benefits and responsibilities with local communities. If mining companies are to contribute to sustainable development, then they need to consider the local community’s desire for a stable socio-economic future that will also
address cultural needs. Ecological sustainability, economic vitality and social equity are principles to apply over the long-term beyond post-closure (Veiga et al, 2001).

It is important to point out that economic sustainability is not the basis from which social sustainability is achieved or maintained. Industrial development analyses must consider community cohesion and way of life in addition to other aspects of social sustainability, such as overall well-being and equity (Brueckner, 2007). Regional industrial growth, although it offers jobs and community investments that contribute to economic sustainability, may end up reducing the ability to traditionally access food resources; something which Indigenous Peoples consider extremely important from a socio-economic and cultural point of view.

Lertzman and Vredenburg (2005) advanced the ethical approach for sustainable development with Indigenous Peoples utilizing a case study. Cross-cultural dialogue was found to be imperative to reach an understanding of the cultural knowledge of sustainable development that Indigenous Peoples can bring to a proposed development (Lertzman and Vredenburg, 2005). Indigenous ways of knowing, previously termed traditional ecological knowledge, can positively contribute to sustainable use of resources, as it is a practice that has been carried out by Indigenous Peoples for generations (Berkes, 2009). However, in the UN Sustainable Development Goals (UN, 2017), Watene and Yup (2015) noted that culture is only mentioned as a target for assisting in achieving these goals. Furthermore, when sustainable development goals are developed by a country, consideration is only given to environmental, economic and community aspects of sustainable development, while cultural aspects are often absent (Watene and Yup, 2015).

A recent description of the sustainable development concept is provided by Flint (2013) as:

“…a system of values by which we reason and choose to live, a process that uses common sense and intuition as a baseline. Sustainability should be viewed as a philosophy, or ethic, affording people awareness of the
consequences of actions and encouraging them to think broadly across issues, disciplines and boundaries."

Therefore, by Flint’s definition, the derivation of sustainable development plans, will vary depending upon the values of those who develop these plans and would be based on the specific vision people have for their future. However, in any case, a simple model for sustainable development includes the need to assess for ecological integrity, economic security and social equity, with the recognition that these three components are interconnected (Flint, 2013).

According to the Bruntland Report definition (WCED, 1987), the extractives industry is not sustainable, as these resources are finite and will not be available for future generations. However, the extractives industry can contribute to sustainable development in several ways. The International Council on Mining and Metals (ICMM, 2017) requires its members to abide by its 10 Principles developed as a framework for the sustainable development in the mining and metals industry as shown in Table 4. Principle 2 outlines the commitment to integrate sustainable development considerations, while the other principles relate more to sustainable business activities that will facilitate the acquisition and maintenance of a social licence to operate. The Canadian initiative titled ‘Towards Sustainable Mining’ (TSM) is similar to the ICMM requirements requiring members’ participation and is applicable internationally (MAC, 2017).

A discourse analysis of sustainable development from the mining perspective utilizing sustainability reports from 2000 to 2012 (128 reports from 21 senior mining companies), as well as Resource Policy Journal articles from 1974 to 2012 (1,660 articles assessed), showed that both sources focussed on what was termed by the authors as transferable sustainability, comprised of sustainable business, weak sustainability, economic development, environmental sustainability and social sustainability (Onn and Woodley, 2014). Transitional Sustainability, which is also a new term, was identified as a discourse representing intergenerational benefits for community and the environment and was the least populated by the reports and the academic journal articles. Moreover, little definition to transitional sustainability was given in either the reports or the literature (Onn and Woodley, 2014). This indicates that minimal attention, at least until 2012, was given
to sustainability of communities beyond the life of a mine by mining companies or by academics.

Mining companies, as part of their Corporate Social Responsibility (CSR) programs, are beginning to implement a new kind of social Investment where assistance is being provided to local communities to encourage economic diversification prior to closure in order to sustain communities beyond the mine life. The gold mining company New Gold, in a town of 5,120 people in Cobar, Australia, planned their project development in conjunction with the local community and all levels of government, to ensure that environmental and socio-economic impacts related to mine and processing plant construction and operation were fully considered, including for the closure phase of the project (McFaul et al, 2013). Through these relationships, the company stated in their 2009 sustainability report that they could make meaningful investments in community development that will be sustainable beyond mining (Newgold, 2009).

Table 4. The ICMM 10 Principles for Sustainable Development.

<table>
<thead>
<tr>
<th>No.</th>
<th>Principle</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Implement and maintain ethical business practices and sound systems of corporate governance.</td>
</tr>
<tr>
<td>2</td>
<td>Integrate sustainable development considerations within the corporate decision-making process.</td>
</tr>
<tr>
<td>3</td>
<td>Uphold fundamental human rights and respect cultures, customs and values in dealings with employees and others who are affected by our activities.</td>
</tr>
<tr>
<td>4</td>
<td>Implement risk management strategies based on valid data and sound science.</td>
</tr>
<tr>
<td>5</td>
<td>Seek continual improvement of our health and safety performance.</td>
</tr>
<tr>
<td>6</td>
<td>Seek continual improvement of our environmental performance.</td>
</tr>
<tr>
<td>7</td>
<td>Contribute to conservation of biodiversity and integrated approaches to land use planning.</td>
</tr>
<tr>
<td>8</td>
<td>Facilitate and encourage responsible product design, use, re-use, recycling and disposal of our products.</td>
</tr>
<tr>
<td>9</td>
<td>Contribute to the social, economic and institutional development of the communities in which we operate.</td>
</tr>
<tr>
<td>10</td>
<td>Implement effective and transparent engagement, communication and independently verified reporting arrangements with our stakeholders.</td>
</tr>
</tbody>
</table>


Recognizing community values and involving local citizens in decisions related to a developing mine can improve governance capacity, which hopefully continues beyond mine closure and contributes to sustainable development (Veiga and Tucker, 2015). Other authors have recognized the ability for companies to assist communities by
investing in projects to diversify the economy, where businesses will survive beyond the end of the mine life (Xavier, 2013; Veiga and Tucker, 2015).”

Although the LNG sector does not have policies similar to the mining sector, the oil and gas sector’s contributions to the sustainable development goals have been mapped (IFC, IPIECA, and UNDP, 2017). These contributions range from providing microcredit financing, solar lamps and agriculture support to communities, to developing innovative petroleum products to prevent substance abuse (IFC, EPIECA, and UNDP, 2017).

The Organization for Economic Co-operation and Development\textsuperscript{10} (OECD, 2016) developed a framework for extractive projects to create shared value through collaborative strategies to assist in developing sustainable economies and specifically meet the UNDP Sustainable Development Goals No. 6, 7, 8 and 9 (OECD, 2016). The five steps of the framework are addressed to the governments, industry and civil society of OECD and non-OECD countries beginning with, 1) adopting a comprehensive long-term vision and implementation strategy for creating shared value, 2) conducting an assessment of opportunities and challenges, 3) focussing on leveraging opportunities from the extractives sector and create linkages to diversify the economy while sharing infrastructure, 4) focussing on collaborative efforts to innovate with modern technology and business. And 5) monitor and evaluate the system necessary to assess progress and make changes if the implementation of the collaborative strategy is not effective.

The Canadian Government sustainable development strategy is focussed on achieving “low-carbon, environmentally responsible economic growth, maintenance and restoration of ecosystems and ensuring Canadians can flourish in clean and healthy environments” (Government of Canada, 2017). The vision is to improve the quality of life for those who live in one of the greenest countries in the world (Government of Canada, 2017). Although not specifically one of the 13 goals, the strategy discusses the need to “protect and sustain” Indigenous cultural and traditional use areas through the sustainable

\textsuperscript{10} The OECD is a group of 34-member countries that discuss and develop economic and social policy. Most member countries are developed (European, USA, and Canada) with a few who have emerging economies, such as Mexico, Chile and Turkey (OECD, 2017).
management of lands and forests, and to sustain culture for tourist opportunities and protect world heritage sites (Government of Canada, 2017). Additionally, Indigenous traditional knowledge is recognized as important to manage for biodiversity (Government of Canada, 2017).

A google search of sustainable development on the B.C. Government website revealed two distinct subject areas, 1) environmental protection and sustainability, and 2) employment, business and economic development (B.C. Government, 2017). While there appears to be no sustainable development strategy for the Province of B.C., there are several acts and regulations to protect water and other ecosystem services when development occurs (B.C. Government, 2017). For specific industries, such as the natural gas and LNG sectors, there are strategies posted on the B.C. Government website documenting the Province’s vision for the industry and listing the economic and employment advantages while promoting the global reduction of GHGs by substituting gas for coal worldwide (B.C. Government, 2017).

Revisiting the Flint (2013) definition of sustainable development, the concept varies depending on the worldview of a specific group or sector. With reference to Indigenous Peoples, frameworks have been developed over time to try to enhance benefits that can come from the extractives industry. For example, O’Faircheallaigh (1998) developed a framework to promote large-scale resource development benefits to be distributed evenly among Indigenous Peoples within a community recognizing the benefits in some cases were not. O’Faircheallaigh (1998) identified at least eight key dimensions for the potential for inequality in Indigenous societies that can arise from mine related impacts. These are gender, age/generation, location, dependence on subsistence, education, kinship/group affiliation, land ownership, and ethnicity.

The Seven Questions to Sustainable Development Framework (2002) was developed to assess whether the net contribution to sustainability from a project or development would be positive or negative over the long-term (Table 5). The Mining Minerals and Sustainable Development (MMSD) Project conducted between 2000 and 2002 researched how the mining and minerals sector could contribute to sustainable development. One of the outcomes of this research was the development of this
framework by a working group of 35 individuals representing a broad range of interests (IISD, 2003). The framework was developed based on the relationship between the Tahltan People in northwest B.C., whose territory is close to the Alaska border, and the mineral exploration and mining industry (IISD, 2003).

**Table 5. Seven Questions to Sustainability**

<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Engagement: Are engagement processes in place and are they working effectively?</td>
</tr>
<tr>
<td>2</td>
<td>People: Will people's well-being be maintained or improved?</td>
</tr>
<tr>
<td>3</td>
<td>Environment: Is the integrity of the environment assured over the long-term?</td>
</tr>
<tr>
<td>4</td>
<td>Economy: Is the economic viability of the project or operation assured, and will the economy of the community and beyond be better off as a result?</td>
</tr>
<tr>
<td>5</td>
<td>Traditional and non-market Activities: Are traditional and non-market activities in the community and surrounding area accounted for in a way that is acceptable to the local people?</td>
</tr>
<tr>
<td>6</td>
<td>Institutional Arrangements and Governance: Are rules, incentives, programs and capacities in place to address project or operational consequences?</td>
</tr>
<tr>
<td>7</td>
<td>Synthesis and Continuous Learning: Does a full synthesis show that the result will be positive or negative in the long-term, and will there be periodic assessments?</td>
</tr>
</tbody>
</table>

Source: MMSD, 2002.

While several concepts exist of what sustainable development means according to a specific worldview, the question of scale or geographic scope can be helpful in defining sustainable development. For example, in the late 1990’s, two projects were assigned panels under the CEAA process and were required to show how the projects would contribute to sustainable development (Gibson, 2000). As with all environmental assessment processes, project effects are geographically scoped relative to the project area and most engagement is with local/regional stakeholders and Indigenous Peoples. The vision for and the concept of sustainable development, in this scenario, is likely more manageable than industry or government specific definitions globally.
3 RESEARCH PROCESS AND METHODOLOGY

3.1 Study Area

This study is focussed on the City of Terrace, City of Prince Rupert, and the District of Kitimat where the LNG facilitates are proposed and the Nations who reside in or near to the project areas. The First Nations who are potentially affected by the proposed developments near the City of Prince Rupert include members of the Tsimshian Nation, the Kitsumkalum, Kitselas, Gitga’at, Gitxaala, Metlakatla and Lax Kw’alaams Nations. Projects proposed in the Kitimat area have the potential to affect the Haisla Nation, Kitselas, Kitsumkalum and the Gitga’at Nations (Tsimshian.).

The City of Terrace is centrally located along Highway 16 in northwest B.C. and hosts the largest population in this area of the Province. To the east, 144 km and 1 hr 38 minutes by vehicle, Prince Rupert is situated on the west coast of B.C., while 63 km and a 55-minute drive to the south along Highway 37 is the District of Kitimat (Drive B.C., 2017). The traditional territory of the Kitsumkalum First Nations Peoples encompasses the Terrace area, including the Kalum River watershed to the north and west to lower Skeena, Skeena estuary and the coast (Figure 4).

The Kitsumkalum First Nation Indian Reserve #1 is located along the Kalum River adjacent to the City of Terrace to the west where 240 registered Kitsumkalum band members live. The remaining 507 members live in the City of Terrace, City of Prince Rupert and the District of Port Edward, while a small percentage reside in Vancouver, Alberta and elsewhere (AANDC, 2016a).

The Skeena River headwaters are located within the Coast Mountain Kitimat range at the edge of the Spatsizi Plateau and meanders for 570 kms. before discharging into Chatham Sound. The temperate rainforest receives heavy rainfall on the western slopes of the Kitimat Range, due to moisture-laden air off the Pacific Ocean. This area is dominated by coastal western hemlock, western red cedar and yellow cedar trees. In warmer, drier areas, Douglas fir, grand fir, western white pine and big leaf maple are present with red alder also occurring in disturbed sites. Black cottonwood is found along rivers, lodgepole pine on very dry sites and Sitka spruce in a variety of habitats (B.C.
Wildlife includes colony-nesting birds along the coast, birds overwintering in estuaries and wetlands, black-tailed deer, grizzly and a subspecies of the black bear, Kermode bear, Pacific giant salamander and tailed frog inhabiting steep cold mountain streams in old forests. The region supports freshwater and ocean-run fish, including sockeye, chinook, chum, coho, and pink salmon, eulachon, herring, seabirds, and large marine mammals such as killer whales and humpback whales.

Figure 4. Kitsumkalum First Nations Territory and Consultative Boundary. Source: Kitsumkalum, 2016.
3.1.1  Tsimshian and Haisla Nations History in the Region

The Tsimshian Nation in B.C. is currently comprised of seven individual bands11: Gitga’at; Gitxaala; Kitselas; Kitsumkalum; Lax Kw’alaams; Metlakatla; and Kitasoo, whose combined territory covers a large area of the north coast of B.C. surrounding the Prince Rupert area and inland to Terrace. Kitsumkalum Band members, the focus of this study, like other Tsimshian members, are related to other Tsimshian Nations and other neighbouring Nations through marriages and bloodlines since time immemorial.

Economically, the Tsimshian have transformed from pre-contact times with European settlers to present day. Before contact, tribes exchanged goods with other tribes, while post-contact this activity occurred mainly with the British, Spanish and the Americans. Due to the forced transfer of ownership and social control of resources from Tsimshian lineages established by the Act of Union in 1871, the ability to trade goods diminished and Tsimshian Peoples were forced into wage labour (McDonald, 1994).

Post-contact, Tsimshian Peoples participated in the logging industry and First Nations on the north coast of B.C. provided most of the fish and labour for the canneries in the late 1800s. Over time, government policy excluded First Nations from accessing fish for trade (or cash) and replaced them with “white” workers (Menzies and Butler, 2008).

The Haisla Nation live along the Douglas Channel and Kitimat Arm and are related to First Nations on Vancouver Island and in the USA based on linguistic evidence (Powell, 2013). The Haisla have 18 Indian Reserves (Powell, 2013), which extend from the lower Kitimat River south along Douglas Channel, Devastation Channel, Gardner Canal, and Ursula Channel (Figure 5). Kitamaat Village, IR2, is where on-reserve Haisla People reside.

3.1.2  European Settlement and Industrial Development in the Region

The Terrace area was settled by transient European placer gold miners in the late 1800’s, followed by the first permanent pioneers who settled along the Skeena River, providing landings for river traffic moving goods between Prince Rupert and Hazelton

---

11 Also referred to as Nations within the Tsimshian Nation
Forest leases or licenses in the Skeena and Nass Valleys were granted in the early 1900’s (Kerby, 1984), with small-scale logging and milling beginning in 1912. The Kitsumkalum Farmers Institute was formed in 1911 and became known as the bread basket of Prince Rupert (Kerby, 1984). The completion of the Grand Trunk Pacific Railway in 1914 changed the pattern of settlement in the Terrace area from river-based to rail-based. By 1927, the population of the newly incorporated City of Terrace was 350 people, with 400 people living in the surrounding area (Kerby, 1984).

In 1944, the Skeena Highway was completed between Prince Rupert and Prince George. Due to the forest industry, Terrace became a boomtown in the 1950’s, with the population surging to 18,000 by 1974 (Kerby, 1984). In 1948, a large Tree Farm License near Terrace (TFL#1) was granted to Columbia Cellulose Ltd., the first one in B.C., and in 1959, Skeena Forest Products Ltd. constructed a mill.

The bust came in 1974-1975 when the world lumber market crashed, and by then much of the local wood had already been logged. During this period, mills shut down for eight months and the population declined to 16,500. Various Provincial and Federal Government offices were moved to the City of Terrace to help mitigate the decline in population. In 1981, 38% of the labour force in Terrace was comprised of government and Crown Corporation employees, while another 32% worked in the commercial-retail sector, helped significantly by the construction of two large shopping malls in this period (Kerby, 1984). The remaining 30% were forestry jobs. In 2011, the population of Greater Terrace was 15,500 (Statistics Canada, 2011a). Currently, Terrace is the service hub of the northwest region, with 46% of employment working in the service sector, compared to 37% regionally (City of Terrace, 2015).

Archaeological evidence indicates the north coast of B.C. has been inhabited by First Nations Peoples for over 10,000 years. Prince Rupert is in the traditional territory of the Tsimshian Nation along the north coast. By the mid 1800s, several salmon canneries were located along the coastline and trading posts had been established in Port Essington, Port Simpson and Metlakatla, with steamships and paddle wheelers serving the area (City of Prince Rupert, 2015).
A 2000-acre town site was constructed in Prince Rupert in 1907 and early 1908, whereby auctions were set up in Vancouver and Victoria in 1909 to sell off 2400 Prince Rupert lots. Generating worldwide interest, the population tripled and in 1910, the City of Prince Rupert was incorporated.
The Canadian Fish & Cold Storage plant opened in 1912 with a drydock, and by 1915 a shipyard was also completed. On April 9, 1914, the first train travelling through to the West Coast arrived from Winnipeg. Eventually, the Grand Trunk Pacific Railway was taken over by Canadian National Railway, with operations lasting until 1954.

During World War II, the strategic geographical position of Prince Rupert resulted in the arrival of thousands of American and Canadian troops and the population increased to approximately 21,000 people.

A pulp mill was established on nearby Watson Island in 1951 and operated for almost 50 yrs. Industrial activity continued to expand with the construction of an airport and both Alaska and B.C. Ferry terminals. Fairview Bulk Grain Terminal opened in 1977 as Prince Rupert's first deep-sea facility, which turned into a container port terminal in 2007. In the early 1980's, a coal and grain terminal was constructed on Ridley Island. A new cruise ship dock was also opened in 2004.

The settlement history by non-natives in Kitimat was quite different from Terrace. Although both areas were settled in the early 1900's, Kitimat did not grow in population until the Aluminum Company of Canada (Alcan) began construction of its smelter in the early 1950's.

In 1907, a sawmill was constructed at Swanson Bay and Kitimat became a small company town and port (Beck, 1983). During this period, the local Haisla Peoples felled trees into the ocean and towed logs to Swanson Bay. By 1935, however, the mill had shut down and economic activities dried up considerably.

The Kitimat Valley had some mining prospectors as early as 1898, although any significant mining activity only occurred until 1909 (Beck, 1983).

Large-scale industrial development in Kitimat began in 1950 when Alcan decided to construct its smelter at the head of Kitimat Arm. The deep-water port, combined with their construction of a hydroelectric generating facility at Kemano, were the two main sources of employment in the Kitimat area. The Town of Kitimat was constructed in 1953 to accommodate workers and their families, which was one of the first planned resource
communities in Canada. The road to Kitimat was completed in 1957 (Kerby, 1984) and by 1969 Eurocan Pulp and Paper came to town, with Methanex (also known as the Ocelot Methanol Plant) arriving in 1982. However, by 2005 Methanex had closed its doors, while Eurocan closed in 2010 (Schmidt, 2014).

More recently, some renewed industrial activity has once again increased the local population because of Alcan changing hands to Rio Tinto Alcan (RTA), which initiated a modernization construction project in 2011. Also in 2011, early construction started on Kitimat LNG, which has attracted a significant influx of workers, raising housing prices. Since 2014, however, with the modernization project complete and Kitimat LNG on hold, housing prices have begun to decline.

3.1.3 Socio-economic Conditions of the Kitsumkalum First Nation

The Kitsumkalum First Nation is one of fourteen tribes of the Tsimshian Nation who have lived on the northwest coast and inland along the Skeena River for thousands of years. The name Kitsumkalum means ‘People of the Robin’ and are made up of four Clans, each of which consist of more than one House Group.

In comparison with the other six Tsimshian Nations living in the region, The Kitsumkalum and the Kitselas Nations have their main reserves close to the City of Terrace while other reserves are remote and only accessible by boat. Like other Tsimshian Nations, most Kitsumkalum members live off-reserve (67%) in the City of Terrace, City of Prince Rupert, the District of Port Edward, and elsewhere (Kitsumkalum, 2015). It is therefore likely the socio-economic status, aspirations and socio-economic barriers for Kitsumkalum are similar to those of the other Tsimshian Nations in the region. As a significant component of this study, the Kitsumkalum population on and off-reserve has been surveyed for quantitative analyses to understand the memberships socio-economic status, perceptions and desires for future education and employment.

Traditional harvesting of the rich and abundant resources found within Kitsumkalum Territory is based on the seasonal rounds of the Tsimshian Peoples. Traditionally, winters were spent in permanent village sites, like Casey Point, each encompassing territorial (Figure 4) and resource bases. Specifically, Kitsumkalum
traditional territory encompasses the Zymacord and Kitsumkalum Rivers, including the Skeena River valley and the ocean at the mouth of the Skeena (McDonald, 1985).

From early colonization to present day, the Kitsumkalum have mainly worked as wage laborers for the canneries and in the forest industry sector (McDonald, 1994). However, due to various cultural, legal and policy restrictions placed on First Nations Peoples, full participation in the local economy has not been possible (McDonald, 1994). In the past, financing for self-autonomous business ventures proved very difficult, given that First Nations communities did not own reservation lands and could not acquire other lands, due to their legal and ancestral rights (McDonald, 1994). Furthermore, different laws made it impossible to own resource extraction licenses, if the Indian status was maintained (McDonald, 1994).

Historically, industrial development has occurred without consent or consultation with the Kitsumkalum and has contributed significantly to loss of access to traditional use areas. Contamination from various industries like the pulp mill that operated for 50 yrs. on Watson Island in Prince Rupert, discharging untreated effluents directly into Porpoise Harbour, has limited harvesting of marine food resources in this area. Physical access to places like Casey Point on Kaien Island, where Kitsumkalum historically had a winter village (McDonald 2013, unpublished), has been restricted due to the presence of the railroad. The village itself was destroyed by the Grand Trunk Railroad constructed from 1906 to 1914 (Royal B.C. Museum, 2017) without consultation, permission or compensation to Kitsumkalum.

Traditional access to salmon has declined since 1891, despite the Reserve Commissioner’s promise to the Kitsumkalum that their fish would not be affected by newcomers. Large-scale harvesting of salmon, combined with habitat loss from extensive logging in the Kitsumkalum Valley, has resulted in declining stocks in recent decades (McDonald, 1994).

Of the four Kitsumkalum Indian Reserves (IRs), IR No. 1, located along Highway 16 west of Terrace, had a total of 80 houses in 2001, of which 25 were noted as needing major repairs and 20 needing minor repairs (David Nairne and Associates, 2001). By
2011, the number of houses had risen to 98, and in 2015, there were 110 homes, with six new homes constructed (N. Okabe, personal communication, December 4, 2015). According to the Kitsumkalum Band Housing Manager, of the 110 homes, 70 are owned by community members, who are responsible for their own maintenance and repairs (N. Okabe, personal communication, December 4, 2015). While older houses are often in need of repair, housing is limited with long waits and there is not enough land to build another subdivision (N. Okabe, personal communication, December 4, 2015).

Affordability of housing off-reserve is the main constraint for people. A family is in core housing need if housing costs are more than 30 percent of pretax income for shelter or if a household lives in crowded conditions or in a house needing major repairs (Catherine Palmer and Associates, 2007). People who are on social assistance or low incomes who cannot afford to live off-reserve may not have any housing option available to them on the reserve. In 2001, a total of 15 houses on Kitsumkalum IR No. 1 were identified as being overcrowded while in 2006, 7% of the population reported overcrowding (Statistics Canada, 2006).

Mak’ola Group of Societies manages four buildings in Terrace and five buildings in Prince Rupert owned by B.C. Housing and 150 scattered units in Terrace and Prince Rupert as well as single family dwellings in nine communities (Makola, 2017). All units are available to both Aboriginal and non-Aboriginal singles or families who require subsidized housing (Makola, 2017).

First Nations Healthcare in B.C. is provided through a tri-partite partnership between First Nations and the Provincial and Federal Governments. Healthcare governance in B.C. was formally transferred over to First Nations in 2011 through a framework agreement between the First Nations Health Society and the two governments. The transfer of governance allows for decision making to be closer to home and tailored to First Nations’ needs (FNHA, 2016).

The First Nations Health Authority (FNHA) provides healthcare services and programs to five Regions within B.C. The study area of the current study is within the
northern region of the province, where 64% of the land area is Crown land, with 36% of the resident population being First Nations (2011) (Table 6).

Table 6. Census population data of Status First Nations in the northern B.C

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern</td>
<td>47,173</td>
<td>15,881</td>
<td>25,435</td>
<td>32,015</td>
<td>12,313</td>
</tr>
<tr>
<td>Total</td>
<td>132,687</td>
<td>61,374</td>
<td>71,313</td>
<td>110,545</td>
<td>75,255</td>
</tr>
</tbody>
</table>

Sources: AANDC and Census, Statistics Canada, 2006 and 2011a

The FNHA is responsible for primary care, public health, health knowledge, mental wellness and substance use, maternal and child health, health human resources, health planning and capital, and health (FNHA, 2016).

A new health centre for the Kitsumkalum Band opened in September 2013, which provides a variety of health services through programming related to healthy childhood development (including pre- and post-natal care), health promotion and disease prevention, mental health and addictions, and home and community care (Health Canada 2013). The Kitsumkalum community has participated in programs and activities such as ‘Building Self Esteem’ and ‘Suicide Prevention’ workshops, Youth Gatherings and the Youth Leadership and Mentoring Program (Kitsumkalum, 2014). Kitsumkalum is also one of the communities involved with the B.C. Healthy Living Alliance initiatives. They use integrated health promotion approaches to address common risk factors for chronic diseases and encourage healthy lifestyles.

Many of the services for the community are collaborated through various agencies working out of Terrace and Prince Rupert. The Northwest Inter-Nation Family and Community Service Society (NIFCS, 2008) is a non-profit society that services nine-member bands, including Kitsumkalum. Their mission is to provide community-based and community-driven child and family care services that protect and preserve the unique cultural identity of every child and family in the bands they serve (NIFCS 2008). NIFCS provides permanency and guardianship programs focusing on children in care. Terrace is also home to the Kermode Friendship Centre, which runs several community programs.
including a youth drop-in centre, an Aboriginal child and youth mental health program, an 
Aboriginal infant and early childhood development program, a fetal alcohol spectrum 
disorder program and a family skills program.

Kitsumkalum students can attend public schools in the Coast Mountain School 
District #82 or the Prince Rupert School District #52. A First Nations education center in 
Terrace, which is adjacent to the Suwilaawks Community School, provides the 
opportunity for teachers and support staff within the school district to incorporate 
Aboriginal resources and curriculum in their classrooms.

Education and training for First Nations communities is often seen as one of the 
greatest tools to strengthen communities. However, according to the Kitsumkalum 
Education Coordinator, First Nations schools and programs, until recently were 
continually underfunded and communities are struggling to gain control of their 
educational systems (C. Guno, personal communication, May 5, 2015). The Kitsumkalum 
Band is aware of the difficulties their children have in the K to 12 public school system, 
where lack of expectations by teachers is one of the existent problems (Auditor General, 
2015). The Provincial educational authorities encourage First Nations students to obtain 
their Evergreen Certificate (School Completion Certificate), which reflects a status of 
special needs (Auditor General, 2015b). While many high school graduates with the 
Evergreen Certificate believe they qualify for college, they are surprised to learn their level 
of education is equivalent to approximately Grade 8 (C. Guno, personal communication, 
May 5, 2015).

Kitsumkalum have established a learning centre on the reserve that runs programs 
from K to 12, which has recently gained independence status in B.C. The Na Aksa Gila 
Kyew Learning Centre is a member of the First Nations School Association and uses 
Sm’algyax (Tsimshian language) to educate students. With twelve staff and a portable 
mobile home for the school, space and resources are limited to an approximate 
enrollment of 70 each year (C. Guno, personal communication, May 5, 2015).
The 2006 census reported that 22% of Aboriginal Peoples between 25 and 64 yrs. of age on the Kitsumkalum Reserve had not completed their high school certificate or equivalent.

Local and regional access to post-secondary education includes Northwest Community College, with campuses in Terrace, Prince Rupert and Kitimat and the University of Northern British Columbia (UNBC) in Prince George, with campuses in Terrace and Prince Rupert. Northwest Community College offers courses in trades, business and continuing education. UNBC, in cooperation with the local colleges, offers undergraduate degrees in Bachelor of Arts, Education, Science (Integrated), Nursing and Social Work. Graduate programs consist of Masters in Business Administration, Disability Management, Education, Science and Nursing. Additionally, certificates and diplomas in First Nations Languages, First Nations Studies and various other continuing studies courses are also offered through UNBC.

The 2006 census (Statistics Canada, 2006) showed that 39% of Kitsumkalum members on-reserve did not have a high school certificate or equivalent while 15% had a high school diploma. Trades was the most common post-secondary educational level attained amongst residents on the Kitsumkalum Reserve (20%), followed by college graduates (18%) and university certificate below bachelors at 6.8%. Those with a University certificate or degree was reported to be 4.5% of the Kitsumkalum on-reserve population. Comparisons with other First Nations reserves in B.C. showed the Kitsumkalum Peoples to be below-average for high school completion and university education, while above-average for trades and college (Statistics Canada, 2006).

The Kitsumkalum Nation is concerned that high school dropout rates will increase as LNG projects in the region continue to develop. Research demonstrates that up to 40 percent of the Kitsumkalum population is at risk for decreased school attendance and an increase in the number of high school drop-outs, with the influence of oil and gas projects on First Nations communities (CSTC 2006).

Like other communities in northwest B.C., the Kitsumkalum Peoples struggle with high unemployment levels and a lack of employment opportunities that match with
community members’ educational and skill levels. In 2006, 29.2% of the 220 Kitsumkalum reserve members age 15 and over were unemployed, compared to an average of 6.0% of Aboriginal reserve members in B.C. (Statistics Canada, 2006).

In September 2014, the Tsimshian Alliance was formed with Tsimshian Nations and LNG companies in the Prince Rupert area to meet regularly (as Employment and Training Roundtables) to discuss employment and training opportunities for Tsimshian Nations. One of the programs offered in December 2014 in Prince Rupert and again in April 2015 and February 2016 in both Terrace and Prince Rupert was called Pathways to Success. This program was funded by BG Group (Prince Rupert LNG early stage proposal to construct at Ridley Island), LNG Canada and the Province of B.C., with the objective of providing basic skills to enter the job market to Tsimshian members over a period of 12 weeks. The Tsimshian Alliance has developed a regional Education, Training, and Employment (ETE) strategy with assistance from LNG companies, the Province and the Federal Government.

In 2006, it was found that 30% of the Kitsumkalum population were working in public administration, 22% in wholesale and retail sales, 19% in resource based industries, and less than 8% combined working in manufacturing, education, health care, and social services and other community services (Statistics Canada, 2006). The median earnings for the Kitsumkalum population in 2005 were $17,673 (Statistics Canada, 2006).

According to the CEO of the Kitsumkalum Economic Development Corp., C. O’Donnell, businesses currently operated by the Kitsumkalum include the House of Simoi-Ghets, which sells local arts and crafts, hall rentals, a full-service gas and convenience store, a rock quarry, boat launch and RV Park and a development company that focuses primarily on forestry and tourism based activities (C. O’Donnell, personal communication, May 4, 2015). Importantly, the Kitsumkalum are also interested in working in the oil and gas industry and many other developments being proposed in their traditional territories (C. O’Donnell, personal communication, May 4, 2015)).
3.2 Sampling Methods

Two sampling methods were chosen for this study, namely the application of survey questionnaires (Appendix A1 and A2) and interviews (Appendix B). Two questionnaire surveys (Q1; and Q2) were distributed to Kitsumkalum Band members and interviews were conducted with people from different sectors involved in the extractives industry.

The questions for the surveys considered the baseline data collection needs of the Kitsumkalum Band and were screened by Kitsumkalum Natural Resource Department staff prior to testing. Additionally, testing was conducted by distributing ten surveys of each type to Kitsumkalum Administration staff, who are also Kitsumkalum members. Changes were made based on feedback from both sources to ensure the questions were culturally appropriate. A research assistant (also a Kitsumkalum member) was hired by Kitsumkalum to conduct the testing of the questionnaires, including disseminating and collecting questionnaires from the membership.

Interview questions were not screened by any sector prior to the interviews, as the questions were general in nature and cultural appropriateness was not required.

Sampling was conducted to maximize quantitative data collection of the socio-economic status of a potentially affected First Nation, both on and off-reserve. The socio-economic status of members within a Nation is an important indicator to understand social equity and also an individuals’ abilities to benefit from large resource developments. With this information, the band can develop specific programs to assist members in areas of need.

Education and employment levels, health and housing conditions can facilitate the enhancement of benefits, or create barriers to economic and social sustainability opportunities generated by LNG developments. Additionally, the willingness of a community member to move away for education, training or work purposes is another important aspect of understanding how economic and social sustainability can be achieved. While it is necessary that First Nations communities are included and capititated to benefit from resource development in their region, which will directly
contribute to social sustainability, other aspects such as community well-being, the preservation of traditional customs, hunting, gathering and fishing rights and the maintenance of relationships with loved ones are equally important. In the past, due to the degradation of these communal, traditional customs of Indigenous Peoples in Canada, there have been serious repercussions, causing a breakdown in these communities and an inability to move forward and improve their standard of living, while at the same time managing to maintain their culture.

In order to garner different perspectives related to economic and social sustainability from various sectors and organizations, it is essential to carefully select both the interviewees and pertinent questions. In this study, interviews were conducted with individuals representing the LNG and mining sectors, the Federal and B.C. Governments, northwest B.C. First Nations; and those involved in local/regional economic development. The questions focused on impediments to economic and social sustainability for First Nations communities and needed improvements in order to create long-term resilience.

While conducting this research, I concurrently worked for the Kitumkalum as a consultant hired to review and comment on the proponents' social impact assessment studies related to LNG developments in the region. Additionally, I was the author of Kitumkalum socio-economic impact assessment reports for some of the proposed projects in the territory and participated as a representative of Kitumkalum in the Tsimshian Alliance from 2014 to 2016. The Tsimshian Alliance is an informal group of five Tsimshian Nations working together to facilitate education and training opportunities for Tsimshian members to participate in LNG related employment.

Even though I was engaged by the Band to assist in the facilitation of socio-economic programs, I have made a very concerted effort to remain impartial, especially in relation to the research I have conducted as part of my thesis. However, in terms of positionality, I realize that the nature of qualitative research sets the researcher as the data collection instrument. Therefore, it is reasonable to expect that the researcher's beliefs, political stance, cultural background (gender, race, class, socioeconomic status, educational background) are important variables that may affect the research process.
Just as the participants’ experiences are framed in social-cultural contexts, so too are those of the researcher.

### 3.3 Methodology

This research applied both quantitative and qualitative approaches, whereby survey questionnaires were quantitative, while key informant interviews (KII) were qualitative. The survey questionnaires were designed to collect data that would allow for characterization of a First Nations community in terms of ETE, housing, access to healthcare, mobility, racism, and access to traditional foods and materials. This information was essential to understand the vulnerability of these communities to boom and bust dynamics resulting from LNG developments in the region. Additionally, the information provided a basis to determine how to maximize benefits from large-scale developments in order to improve people’s standard of living, while at the same time fostering economic, environmental and social sustainability.

The purpose of the KII was to understand how industry, First Nations, and Provincial and Federal Governments view the extractives industry and its potential contribution to sustainable development initiatives in northwest B.C., especially in relation to the well-being of Indigenous communities. The two research methods were chosen to obtain data and information at the local and regional levels pertaining to status, aspirations, and attitudes towards the extractives industry and sustainable development for Indigenous Peoples. The insight acquired from this research together with the knowledge from previous studies would then provide the basis from which a framework could be proposed to facilitate the maximization of benefits and minimization of impacts from LNG, as well as further contributing to sustainable development in Indigenous communities.

#### 3.3.1 Survey Questionnaires

The questionnaires were based on the assumption that there are individuals within First Nations communities who are vulnerable to a worsening standard of living during a boom phase of large resource developments, due to lack of employment support, affordable housing, and access to healthcare. These individuals include the youth, elderly, disabled, single parents, low income (and potentially fixed income), those with
high debt and those with limited education. The questionnaires were designed to especially identify the most vulnerable individuals within the community and correlate responses relative to educational and employment opportunities, financial security, access to housing and healthcare.

Survey Q1 (Appendix A1) was designed to identify skills and employment capacity for each of the 537 Kitsumkalum members 18 yrs. and over. Additionally, each member was asked to list his/her interest in future ETE and business development in the region. Some questions asked parents about school preferences, in relation to their school-age children (Kindergarten to Grade 12) reasons for their children deciding to drop out (if that was the case) and whether mentoring was important. This questionnaire also requested the individuals' names and contact information, which required a consent form to be signed. Finally, the information collected in this questionnaire was to be used for a recruitment database by the Kitsumkalum Band.

In total, 211 Q1 surveys were returned from 537 sent out. From these 211 surveys, a 95% confidence interval was obtained, with a margin of error of $\pm 5.26$. For example, if 50% of those surveyed reported they completed high school, there was 95% likelihood that the true value was between 44.74% and 55.26%. For Q2, with 71 returned surveys from 137 randomly selected and mailed out to 40% of Kitsumkalum members living in northwest B.C.\textsuperscript{12}, the margin of error with 95% confidence was $\pm 10.4$.

Survey Q2 (Appendix A2) was designed to characterize the Kitsumkalum First Nation in terms of their status and desires related to ETE, business, housing, access to healthcare, mobility, racism, barriers to ETE, and access to traditional foods and materials. For Q2, no personal information (name, phone number) was requested.

In addition to multiple choice questions, both Q1 and Q2 contained several questions using a Likert-like scale (0 to 10), where 0 represents complete disagreement and 10 represents complete agreement to the statement. If a respondent chose 5, this would indicate that they neither agreed or disagreed with the statement. The original Likert Scale is a five-point scale developed by Rensis Likert in 1932 to measure

\textsuperscript{12} Total number of Kitsumkalum Members aged 18 and over living in Northern B.C. is 343.
psychological attitudes (Likert, 1932). The 10-point (0-10) scale chosen for this study was utilized by a PhD student (Dunham da Costa, 2008), who studied the quality of life of mine workers in remote communities. As discussed in the 2008 dissertation, the 10-point scale was argued by Cummins and Gullone (2000) to have a more appropriate level of sensitivity for survey questions related to quality of life.

Questions utilizing a Likert-like scale were related to preference for tutoring, satisfaction in access to education, mobility, business aspirations, housing affordability, access to healthcare, and use of traditional foods and materials.

A $25 grocery reward and the opportunity to win an IPad was offered to encourage participation in the surveys. Sealed envelopes were returned in person or by mail and the grocery card was provided in person or by mail by the research assistant at the Kitsumkalum Economic Development Office on the reserve. Each questionnaire was opened only by the research assistant and myself at the Kitsumkalum Economic Development Office and assigned a survey number to maintain anonymity. All questionnaires were kept in a locked filing cabinet and corresponding data in the two databases were password-protected.

3.3.2 Key Informant Interviews

The purpose of the KIIIs was to compile different perspectives on issues facing northwest B.C. First Nations and summarize potential ideas to improve the economic and social sustainability of those communities. Interview questions were open-ended (Appendix B), allowing for the interviewee to discuss a theme or sub-theme related to the questions asked. Interviewees were not prompted to answer the question in any other way than how it was written on the document provided to them. The interview was recorded by typing the responses to the questions into a word document during the interview. Each response was then read back to the participant to ensure veracity. The duration of each interview was approximately 30 to 45 minutes.

Prospective participants currently living and/or working in northwest B.C. were contacted by telephone to request their participation. A summary of the study with the
question and consent form were sent by email prior to the interview. The interviews were conducted either by telephone or in person.

3.4 Data Analysis

Data analysis was performed on both questionnaires Q1 and Q2. Two databases were developed to allow for analysis of the responses for each question, while at the same time being able to correlate questions in terms of different subject groups to ascertain any differences that may exist among the groups. For example, responses to questions on mobility (willingness to move away for school or work) were segregated into youth (age 18 to 30 yrs.), females, and males. Data and information provided for each returned survey questionnaire was entered into a programmed Microsoft Access Database for both Q1 and Q2. The Q1 database compiled ETE information from 211 respondents, while the Q2 database tabulated information for 71 respondents.

In order to gain some understanding of each Kitsumkalum member’s relationship and connection to the ocean, freshwater and land environments, two types of questions were asked in Q2: one for traditional foods and the other for traditional use materials. For the purposes of this study, “relationship and connection”, was defined by: either rights or knowledge regarding where to access traditional use food/materials, whether a person accesses these resources themselves, or someone else provides for them. The Likert-like scale data was modified to remove the bias associated with more respondents (results) from an age group, enabling comparisons to be made among age groups. This was conducted by taking the sum of Likert-like scale responses and calculating the average response for each age group.

For each of the 31 interviews conducted, qualitative data was analyzed to create quantitative data using Qualitative Conventional Content Analysis (Hsieh and Shannon, 2005). Each interview was examined twice for specific subjects raised during the interview and coded accordingly. From this coding scheme, categories were developed and grouped based on their similarities and differences. Based on the groupings, themes and subthemes were developed and arranged into groups. The theme and subthemes were then tabulated to identify the percentage of individuals from each of the five sectors who mentioned the Subtheme.
Specific quotes from individuals were paraphrased to express the opinion of those who spoke about a specific Theme or Subtheme. The highest percentage for the Subthemes was used for the Theme, then percentages from the different sectors for each Theme were averaged to assign rankings. This ranking then shows the Theme of most to least importance for the different sectors. Utilizing the Theme and Subtheme tables created with the data, ranking per sector for each Theme is also obtained.
4 RESULTS AND DISCUSSION

Finding ways to bring back resilience is important for the well-being and long-term sustainable development of First Nations communities and their off-reserve members. Vulnerability, like resilience, has multiple definitions. For this dissertation, vulnerability is defined as the inability to adapt to changing conditions to avoid poverty or to become poorer. Vulnerable people to large resource developments are those who are unable to adjust to the increased cost of housing, reduced access to healthcare, increased violence, crime or addictions, loss of access to traditional use areas, and other socio-economic impacts known to occur from boom-bust dynamics. Vulnerable people need assistance to manage these effects through counselling, mentoring and support mechanisms, including education, training and employment opportunities, which help to increase self-reliance, standard of living and career orientation.

Additionally, in order for First Nations communities to moderate boom-bust dynamics, they need 1) greater certainty around project approvals and what these projects mean in terms of benefits and impacts with mitigation and, 2) to develop a governance structure whereby benefits, such as employment, contracts and resource revenues, are utilized effectively to improve the overall socio-economic status of the band beyond the boom period. This section of the thesis provides the results of the interviews and surveys in the context of how First Nations communities can move towards a sustainable future through the maximization of benefits and the minimization of impacts.

First Nations, like other people living in the region, are familiar with contracting and employment benefits that come from resource extraction activities. As discussed in Section 3.1, people living in the region have historically relied on the commercial fisheries and forestry sectors for well-paid employment. These industries are not as prevalent as they once were, and people, including First Nations, are now looking for opportunities in the mining and LNG sectors.

Common themes identified during the interviews by the five sectors interviewed in order of importance when accounting for all sectors were: 1) Education, Training and Employment (ETE), 2) Governance, 3) Social Issues and Barriers, 4) Supports Needed for ETE, and 5) Environmental Issues, as shown in Table 7. The five sectors interviewed
were representatives from the Federal and Provincial (B.C.) Governments (Fed/Prov Combined), First Nations, LNG, mining, and economic development (Ec Dev).

Table 7. Common Themes identified by five sectors interviewed.

<table>
<thead>
<tr>
<th>THEMES</th>
<th>Fed/Prov Gov Combined (n=6) (%)</th>
<th>First Nations (n=8) (%)</th>
<th>LNG (n=5) (%)</th>
<th>Mining (n=7) (%)</th>
<th>Ec Dev (n=5) (%)</th>
<th>TOTALS (n=31) (%)</th>
<th>RANKING ALL SECTORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education, Training and Employment (ETE)</td>
<td>83</td>
<td>63</td>
<td>80</td>
<td>86</td>
<td>60</td>
<td>74.4</td>
<td>1</td>
</tr>
<tr>
<td>Governance</td>
<td>83</td>
<td>50</td>
<td>80</td>
<td>57</td>
<td>60</td>
<td>66</td>
<td>2</td>
</tr>
<tr>
<td>Social Issues and Barriers</td>
<td>33</td>
<td>75</td>
<td>60</td>
<td>71</td>
<td>60</td>
<td>59.8</td>
<td>3</td>
</tr>
<tr>
<td>Supports Needed for ETE</td>
<td>67</td>
<td>50</td>
<td>60</td>
<td>29</td>
<td>40</td>
<td>49.2</td>
<td>4</td>
</tr>
<tr>
<td>Environmental Issues</td>
<td>0</td>
<td>13</td>
<td>60</td>
<td>29</td>
<td>0</td>
<td>20.4</td>
<td>5</td>
</tr>
</tbody>
</table>

Results from the questionnaires provided quantitative data to further support the importance of these Themes. Each Theme and Subthemes are discussed in Sections 4.1 to 4.5.

4.1 Education, Training and Employment

The education, training and employment (ETE) Theme as shown in Table 7 was ranked as No. 1 by all sectors combined. Subtheme data in Table 8 shows that Mining (86%), LNG (80%), and Government sectors (83%) considered ETE to be a very important barrier during the interviews, while 60% of the economic development sector and 63% of First Nations mentioned the Subtheme.

ETE are interrelated and together form a key aspect of potential socio-economic benefits resulting from resource development and which contribute positively to long-term sustainability (UNESCO, 2014). With 27,559 jobs to be created over a five-year period for the construction of two to three LNG projects in B.C. (direct, indirect and induced), moving 30 million tonnes per annum of LNG annually (Robins et al, 2016), ETE opportunities will be vast. Currently, some educational and training opportunities are already being offered in northwest British Columbia to increase the availability of skilled trades people.

Research has shown that an increase in educational knowledge is directly correlated to improvements in employment status and earnings (Richards, 2014). When comparing British Columbia, Alberta, Saskatchewan, Manitoba, Ontario and Quebec,
Richards (2014) found that B.C. and Ontario had much better educational outcomes for Aboriginal Peoples.

Table 8. Common Subthemes for ETE Theme

<table>
<thead>
<tr>
<th>ETE Theme. Rank = 1</th>
<th>Federal &amp; Provincial Gov. Combined (n=6) (%)</th>
<th>First Nations (n=8) (%)</th>
<th>LNG (n=5) (%)</th>
<th>Mining (n=7) (%)</th>
<th>Ec Dev (n=5) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ETE is a barrier</td>
<td>83</td>
<td>63</td>
<td>80</td>
<td>86</td>
<td>60</td>
</tr>
<tr>
<td>2. There is a need for long term employment &amp; careers</td>
<td>50</td>
<td>13</td>
<td>0</td>
<td>14</td>
<td>40</td>
</tr>
<tr>
<td>3. Creating shared value &amp; increasing business capacity is important</td>
<td>0</td>
<td>38</td>
<td>60</td>
<td>86</td>
<td>60</td>
</tr>
<tr>
<td>4. There is a need for mobility</td>
<td>33</td>
<td>0</td>
<td>20</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5. There is a need to be a competitive contractor</td>
<td>0</td>
<td>13</td>
<td>40</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6. Targets for employment may help</td>
<td>0</td>
<td>0</td>
<td>20</td>
<td>29</td>
<td>0</td>
</tr>
</tbody>
</table>

In B.C., successes are likely attributable to additional funds provided to provincial schools over the past two decades for Aboriginal students to develop enhancement agreements with Aboriginal leaders, as well as monitoring/publishing of Aboriginal progress at the school level. In addition, province-wide organizations such as the First Nations Schools Associations and the First Nations Education Steering Committee are playing an active role in programming to help improve Aboriginal student success (Richards, 2014).

4.1.1 Education Status

For members of the Kitumkalum Band, efforts to improve educational outcomes appear to have been worthwhile. In 2006, only 16% of people 15 yrs. and older who were living on-reserve (n=220) had a high school diploma, compared with 33.9% (n=169) in January 2016\textsuperscript{13}. While the percentage of people who are college-educated increased from 18% in 2006 to 24.7% in 2016, the percentage of people in the trades decreased from 21% to 16.3% over the same time period. This may be because more women are becoming educated and employed over time and prefer college over vocational training.

\textsuperscript{13} Retired, disabled and those who did not answer the question were removed from the dataset
The percentage of Kitsumkalum Band members who are university educated increased from 4.5% to 7.3% during the same period (Statistics Canada, 2006).

Table 9 represents the level of education results from Q1 for on and off-reserve Kitsumkalum members 18 yrs. and older compared to 2006 Statistics Canada data for Kitsumkalum on-reserve individuals on-reserve15 yrs. and over. Although the level of high school completion increased from 16% to 33.7% for both on and off-reserve Kitsumkalum members between 2006 and 2016, this rate is still much lower than the provincial Aboriginal\textsuperscript{14} completion rate of 62% measured in 2014 (Auditor General, 2015b). However, both rates are likely overestimations, due to a disproportionate number of Aboriginal students in B.C. being classified as special needs and routed through the Evergreen Certificate program (Auditor General, 2015b), since it began in 2004. While the Evergreen Certificate recognizes the completion of high school, it is not the same as a Dogwood, where specific courses are required to graduate. In fact, a First Nations representative noted this was a problem for her community, as students applying for post secondary education found out that they did not have the credentials necessary to enter any of the programs.

Although the education gap between Aboriginal and non-Aboriginal students has narrowed, many districts in B.C. are also not on par with the average graduation rate (62%) of Aboriginal Peoples in B.C (Auditor General, 2015b). Therefore, the educational disparity with non-Aboriginal students remains high while disparity among Aboriginals living in different areas of the Province still exists. For example, 21% of urban non-Aboriginals in 2006 had a bachelor’s degree or higher level of education compared with 4.3% of off-reserve Aboriginals, 2.6% rural Aboriginal, and 4.7% urban Aboriginal Peoples in the same year in B.C. (Statistics Canada, 2011b).

\textsuperscript{14} Aboriginal includes on and off-reserve Metis, Inuit and First Nations in B.C. and Canada
Educational outcomes at all levels appear to be better on-reserve than off-reserve for all Kitsumkalum members, unlike the rest of B.C., where 65% of off-reserve Aboriginal students completed high school in 2014, compared with only 50% First Nations on-reserve (Auditor General, 2015b). This may be because post secondary band funds are administered on-reserve for all band members. Additionally, those who work on-reserve may require post secondary education to maintain their positions, such as finance or social services and access the funds accordingly. However, it is important to point out that the Kitsumkalum Reserve is only located two km away from the City of Terrace, which may pose an advantage over other on-reserve students, who must travel long distances to access education.

The Q1 data shows that high-school completion of Kitsumkalum members appears to be improving, as the highest percentage (46%) were youths, followed by males at 35% and females at 33% (Figure 6). For post-secondary education, females showed the highest percentages with both college (36%) and university (9%), followed by males with 9.8% and 4%, respectively. Although youth showed less college education (10%), they had a higher percentage of university education (7%) than males. Males with trades (25%) exceeded both females (7.6%) and youth (12%).

These results are generally consistent with 2006 data for Aboriginal Peoples in Canada, where females accessed more post-secondary education than men (Wilson and Macdonald, 2010).

Another look at the educational status data from an age group perspective shows that trades or college-educated members make up the greatest percentage within the age

<table>
<thead>
<tr>
<th>Level of Education</th>
<th>2006 On Reserve, % of Kitsumkalum members 15 yrs. and over (n=220)</th>
<th>Off-Reserve, % of Kitsumkalum members 18 yrs. and over (n=60) from Q1</th>
<th>On Reserve % of Kitsumkalum members 18 yrs. and over (n=109) from Q1</th>
<th>All Kitsumkalum members 18 yrs. and over (n=169) from Q1</th>
</tr>
</thead>
<tbody>
<tr>
<td>No high school completion</td>
<td>n/a</td>
<td>23.3</td>
<td>14.7</td>
<td>17.8</td>
</tr>
<tr>
<td>With high school completion</td>
<td>16</td>
<td>33.3</td>
<td>33.9</td>
<td>33.7</td>
</tr>
<tr>
<td>College or trades training</td>
<td>39</td>
<td>38.4</td>
<td>44.1</td>
<td>42</td>
</tr>
<tr>
<td>University level</td>
<td>4.5</td>
<td>5</td>
<td>7.3</td>
<td>6.5</td>
</tr>
</tbody>
</table>

groups of 41 to 60 yrs., while the majority of individuals with the highest level of education being high school completion pertain to the 18 to 30 yrs. and over 60 yrs. age groups (Figure 7).

An LNG company representative noted that “emphasis on education in the northern part of British Columbia is generally poor and even worse for First Nations”, adding that there are now less jobs in fisheries and forestry than before. Other reasons for the lack of emphasis on the quality and quantity of education may include: educational institutions have catered to local and regional demand for courses and programs that may not necessarily lead to local or regional employment or the start-up of new businesses, and there is currently no detailed long-term educational plan for the region to grow and diversify economically.

As discussed in the literature review, Kitsumkalum members have traditionally worked in the forestry and fishing industries since colonization, as Terrace began as a logging town and Prince Rupert thrived on commercial fishing. However, the level of
activity in these industries has declined since the 1980’s, reducing the employment for non-educated labourers. Moreover, combined with a lack of economic diversification in the region, there are few alternatives for jobs, which increases unemployment. Although many Kitsumkalum members are interested in upgrading their education and pursuing post-secondary courses, there is not enough band funding to accommodate all of the requests (C. Guno, personal communication, May 5, 2015).

A provincial government representative noted that 96% of the jobs in B.C. require a post-secondary education or specialized training, outlining the need for capacity-building educational programs, especially for underprivileged groups. This is challenging in municipalities with populations of 10,000 to 20,000, where the colleges and universities have a more limited scope in terms of specific courses and programs to serve the region. Since the 1990’s, funding has been allocated to implement a wide array of courses and programs, targeted to insure social inclusion and equality issues are addressed, while at the same time facilitating labour force development as a market sector (Fisher et al, 2009). It is likely that most people, both Indigenous and non-Indigenous, don’t realize that 96% of jobs are not attainable without some training post high school completion.
The B.C. Ministry of Advanced Education’s 2016/17 – 2018/19 Service Plan (2016) describes the Ministry’s key role in ensuring B.C. has skilled workers to meet labour market needs and capitalize on economic development opportunities. The strategy is to train people for anticipated LNG-related jobs over the next several years as described by the B.C. Skills for Jobs Blueprint: Re-Engineering Education and Training (Work B.C. 2014). One such project called ‘Woodfibre LNG’ has been approved close to Squamish, B.C., while others await financial investment decisions.

While it is important to anticipate necessary skills before jobs are available, it is prudent to realize that not all LNG projects will be financed and constructed. Although several labour demand and supply studies conducted in northwest B.C. have focussed on anticipated LNG and pipeline projects, very little information is available about the labour demand in the region without LNG.

Mills and McCreary (2013) discuss how there was a change in courses offered at Northwest Community College in B.C. in response to regional Aboriginal Peoples’ preference for indigenous courses and training in the 1990’s. While it is important for post secondary institutions to respond to local and regional demands and provide arts and culture programming, equally important is creating an awareness about the linkages among education, training and employment, long term careers, economic growth and diversification, which will all contribute to sustainable development and a better standard of living for the residents living in the region.

### 4.1.2 Employment Status

For 172 respondents\(^{15}\) who responded to Q1, Kitsumkalum unemployment was 20.8%, which is 4.4% higher than the provincial Aboriginal unemployment rate of 16.4% (MARR, 2012). In comparison to the total B.C. unemployment rate in 2011 of 7.2% (MARR, 2012), the Kitsumkalum unemployment rate was 13.6% higher.

Table 10 shows Kitsumkalum employment status on and off-reserve for Q1 data compared to 2006 data for on reserve only. While 41.5% of Kitsumkalum members were

\(^{15}\) Unemployment, underemployment and employment rates exclude those who are disabled, retired, or in school part time or full time.
employed, 37.7% were deemed to be under-employed and 7.6% were in school. On reserve Kitsumkalum members have a lower unemployment rate (17.3%) and higher employment rate (46.2%), with less members attending school (5.5%) than off-reserve members. Similar to education, employment conditions appear to have improved on reserve compared to the 2006 census, where unemployment was 29.2% and employment 39.5% (Statistics Canada, 2006). The off-reserve Kitsumkalum employment rate (32.7%) was much lower than the off-reserve Aboriginal rate for the entire province in 2011, when 41.9% were employed (B.C. Stats, 2011).

**Table 10.** Kitsumkalum employment status on and off-reserve

<table>
<thead>
<tr>
<th>Status</th>
<th>2006 On-Reserve, % of Kitsumkalum members 15 yrs. and over (n=220)</th>
<th>2016 Off-Reserve, % of Kitsumkalum members 18 yrs. and over (n=62)</th>
<th>2016 On Reserve % of Kitsumkalum members 18 yrs. and over (n=110)</th>
<th>2016 All Kitsumkalum members 18 yrs. and over (n=172)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployed</td>
<td>29.2</td>
<td>27.3</td>
<td>17.3</td>
<td>20.8</td>
</tr>
<tr>
<td>Underemployed</td>
<td>n/a</td>
<td>40</td>
<td>36.5</td>
<td>37.7</td>
</tr>
<tr>
<td>Employed</td>
<td>39.5</td>
<td>32.7</td>
<td>46.2</td>
<td>41.5</td>
</tr>
<tr>
<td>in school</td>
<td>n/a</td>
<td>11.3</td>
<td>5.5</td>
<td>7.6</td>
</tr>
</tbody>
</table>


The results for youth employment showed 28% employed, 29% underemployed\(^\text{16}\), 24% unemployed, with the remaining 19% in school (Figure 8). In comparison, 38% of women were employed, 34% underemployed, 15% unemployed and 11% in school (Figure 9). Male employment (≥18 yrs.) was greater than youth and females with 40% employed, 37% underemployed, 18% unemployed and only 4% in school (Figure 10).

\(^{16}\) Part time or seasonal
Figure 8. Youth, 18 to 30 yrs. employment status
n=42

Figure 9. Females, ≥ 18 yrs. employment status
n=87
The Q1 results showed that the number of Kitsumkalum members not working but looking for work was 38% (n=172). As shown in Figure 11, the 31 to 40 yrs. age group showed the highest percentage looking for work.

Figure 11. The percentages of Kitsumkalum members not employed but looking for work.
For all groups: n= 66. For age group 18 to 30 yrs., n=12; 31 to 40 yrs., n=15; 41 to 50 yrs., n=14; 51 to 60 yrs., n= 14; Over 60 yrs., n= 11.
It appears that industry and government tend to rely on employment as a panacea for social problems, resulting in little or no investments in programs for life-enhancement or long-term sustainable careers. The importance of education and training for long-term employment or careers, which was a Subtheme of ETE, was raised by only one half (50%) of provincial and federal government representatives and 40% from the economic development sector (Table 8). In comparison, less than 15% of First Nations and mining representatives mentioned the need for long-term careers, while not one representative from the LNG sector discussed the need for secured employment or careers as a path to long-term sustainable development in First Nations communities. Interestingly, creating shared value and increasing business capacity was deemed to be important by the mining sector (86%), followed by LNG and the economic development sectors at 60% each. Benefits in the form of direct employment and procurement opportunities during the construction phase has been promoted by the LNG sector in northwest B.C.

Without a long-term vision and commitment from industry to develop an integrated approach for improving Aboriginal participation in ETE, results can be less than encouraging, as demonstrated by a training program delivered by a mining company in the Northwest Territories. In the initial phase of the program, the Indigenous students were told that if they did not meet the course expectations, they would not move on to the next training phase (Bell, 2013). As the testing was based on how a person talked and dressed, mental health issues were often cited by the trainers as the reasons why someone did not move on to the next phase. In that training program, four out of ten individuals did not pass the first phase, which created a lot of mistrust between the students and the training organization. Then, when a financial downturn occurred in the industry, even the people who did complete the training did not end up getting hired, leading to continued unemployment (Bell, 2013).

In northwest B.C., significant opportunities currently exist for trades training to prepare people for work in LNG construction projects. However, at the same time, it is crucial to develop skills and employment opportunities that don’t rely on LNG, in order to diversify the economy and prepare the regional workforce for the end of the construction phase, when the large number of trade jobs disappear. Clearly, for First Nations people
who are already at a disadvantage in terms of ETE capacity and opportunities, more attention is needed to empower these communities for a better future.

Local and regional colleges and universities in northwest B.C. currently provide specific educational and training programs, which encompass different trades, health, social work, art, environmental monitoring certificates, diplomas and degrees. Although several labour demand and supply studies have recently been undertaken by the Provincial Government to understand the specific needs of the LNG industry, it is not known how these educational programs satisfy the demand for other employment needs and capacities within the region, such as health care, teachers, engineers, accountants or lawyers.

For those who are able to take advantage of LNG-related opportunities, the end of the construction phase typically poses a large economic downturn, which results in serious socio-economic impacts, especially when other projects are not being constructed or in operation at the same time. In order to avoid unemployment, many local people would then be forced to look for work elsewhere, requiring a willingness and the capacity to move away from their community.

4.1.3 Desire for Further Education and Education Mobility

The top categories chosen for desired education and training by all respondents to Q1 were trades training\(^{17}\) 21%, college at 18% and university at 13% (Figure 12). It is important to note there has been a great deal of discussion about LNG developments being implemented in the region over the past ten years and people are anxious to access these high-paying resource jobs. For 60% of the age groups over 50 yrs. old, there is no interest in future training, as they are likely already well-established in their current professions or are retired. Therefore, these individuals were removed from the dataset.

---

\(^{17}\) Trades training refers to training in vocations such as pipefitting, plumbing, electrical, welding
Youth are the most interested in pursuing a college certificate or diploma (24%), followed by trades (22%) and then university (18%) (Figure 13), while the 31 to 40 yrs. age group preferred trades (31%), followed by college (17%), high school completion (dogwood diploma) at 15% and university and employment readiness tied at 13% (Figure 14). The 41 to 50 yrs. age group had the highest percentage of not interested (24%), followed by college (24%), then trades (21%) (Figure 15).

![Diagram showing preferences for training types.](image)

**Figure 12.** Q1 averages derived from the responses by all age groups on what type of training is preferred.
The not interested category excluded 25 responses from the over-50 age groups. Total responses = 232; n=168

Although research has been done on the mobility or migration of Aboriginal Peoples from reserves to large cities within Canada (Norris and Clatworthy, 2011), there don’t appear to be any studies related to movement due to education or work opportunities. However, data from the 2006 Census showed that Aboriginal Peoples in Canada changed residence more often than non-Aboriginals, with percentages of 20.1% and 16.5%, respectively (Statistics Canada, 2006). This could indicate that non-Aboriginals are less forced to move due to socio-economic issues, although the real reasons for higher mobility of Aboriginals remain unclear.
Figure 13. Education aspirations for the 18 to 30 yrs. age group.  
n=54

Figure 14. Education aspirations for the 31 to 40 yrs. age group.  
n=46
Despite the higher rates of mobility for Aboriginal Peoples, the question is often asked, “Why won’t they move for work or education opportunities?”. An LNG representative also mentioned the same issue as being a challenge for all individuals, not just Indigenous Peoples, who have become somewhat isolated from a broader society. Regardless, for the Kitsumkalum First Nation, Q1 showed that 31%, 32% and 27% would be willing to move within their existing region, within northern B.C. and within Canada, respectively, for work and/or education opportunities. These results further support the need to characterize each community and population to understand what type of ETE would fit their long-term plans, recognizing that LNG developments have a limited period of high employment in a particular location.

During the interviews, mobility was the least-mentioned issue, with only 30% of government and 20% of LNG representatives mentioning this subtheme, while none of the other sectors brought it up at all. The Q1 results showed that less than half of the Kitsumkalum respondents (40%) would be willing to move away from home to take courses for any length of time, in order to improve their chances of landing a job or getting a better one (Figure 16).
From the youth respondents, 48% said that they would be willing to move away for education, although 18 to over 60-year-old males showed greater willingness (48%) than females within the same age group (34%). The lower percentage of females willing to go away for education is likely due to their role as the main caregiver for children, and perhaps elders as well.

For some people, mobility can be a problem, as they feel uncomfortable away from their community and do not have the support they need in order to succeed. Although results from Q1 showed that many Kitsumkalum members would be willing to leave their community temporarily for education, training or employment, they would prefer to not have to leave permanently (Figure 17). Therefore, in order to persuade Indigenous Peoples to move away for studies and be able to succeed in these endeavours, it is vital to provide support mechanisms for travel, housing and other means.

Results from the Q1 questionnaire showed that less than half of the youth would be willing to move away from their community for work opportunities, with only 24% accepting to move within Canada, while 40% would go somewhere else within northern
B.C. Regarding a camp scenario, 33% of total respondents would be willing to be away from home for several weeks at a time as shown in Figure 17.

![Figure 17. Kitsumkalum members work mobility](image)

**Figure 17.** Kitsumkalum members work mobility

It is clear that most people would prefer to stay in their community for the rest of their life (49% in favor; 27% neutral; 24% disagreed) and raise their children in the community (50% in favor; 32% neutral; 18% disagreed). However, if provided with an opportunity for an affordable house and a job 1000 km away, 45% reported they would accept the offer (23% neutral; 32% would not take the offer) (Figure 18). Although these results show that most people would prefer to stay within their current location, they are willing to move in order to increase their standard of living.

From 2014 to 2016, the Tsimshian Education and Training Roundtable met regularly to discuss how regional First Nations in northern B.C. could participate in LNG-related jobs. In addition, an LNG Alliance initiated by B.C. Premier Christy Clark has been meeting regularly since 2014 to address labour force issues among other B.C. LNG-related issues. In part, the effectiveness of these initiatives can only be evaluated through the monitoring of socio-economic conditions over time of each First Nation living in the region, both on and off-reserve.
Typically, the mining industry sets targets based on local First Nations populations living in the area. For example, 50% of the workers of one mining company currently operating in the northern part of the province are from the region, although the company has set a long-term target of 67%. The challenge is that jobs available today require much more education and skill than even 10-20 yrs. ago and local people need to improve their work capacities in order to qualify for these positions. Setting targets can be helpful in terms of monitoring, awareness and transparency, which help to provide a sense of accountability for the decision makers. However, only the mining (29%) and LNG sectors (20%) mentioned targets for employment during the interviews. While some of the comments made by mining representatives were in the context of setting targets, the LNG sector felt targets were difficult to set, as there was not enough socio-economic data about Aboriginals in the region to inform whether or not the targets could be met.

4.1.4 Economic Development and Diversification

"People want to make big money fast and many people do not prepare for the end of the boom. Better to invest in the future with the money’. (Economic Development representative).”

Historically, northwest B.C. has been developed by way of forestry, fishing and mining initiatives and continues to be dependent on these sectors for sustenance of the
regional economy. However, as in many regions which rely on the extractives industries, regional economics fluctuate based on commodity prices and the global demand for these products. Unfortunately, this kind of dependence on raw resource extraction will perpetually continue, unless concerted efforts are made to diversify the local and regional economies.

In addition to the desire for northern B.C. First Nations to receive training and post-secondary education, many First Nations representatives during the Tsimshian Alliance meetings, as discussed in Section 3.1.3, noted the need for long-term employment opportunities, which are difficult to acquire in resource-dependent communities. Economic development and diversification to provide long-term employment opportunities requires a multi-faceted approach. This type of strategy would include: 1) capacity-building through ETE, as discussed previously, 2) enhancing existing businesses and developing new economic opportunities, and 3) facilitating place-based development.

A key component and necessary endeavour for diversification of the local and regional economy is the need to increase people’s capacity to develop, build new businesses and enhance existing ones (Arezki et al, 2011). Lederman and Maloney (2007) claim natural resource development propels economic growth in countries where human capital is above a low threshold. More attention is required to develop people’s skills to establish long-term careers in sustainable businesses.

It is important to recognize that economic development initiatives should help improve established businesses, as well as encouraging new ones. For example, the United Kingdom implemented policies in the 1980’s to encourage new businesses, which was based on the premise that increased competition would result in employment and productivity growth for existing businesses, resulting in stronger businesses being able to out-compete the weaker ones (Derbyshire, 2012). However, Shane (2009) argues that economic growth is not a result of new businesses, as most new businesses are self-employed. Furthermore, as these businesses do not employ other individuals, Shane (2009) suggests that policies should focus on businesses that are better able to enhance economic growth. Derbyshire (2012) corroborated Shane’s results, showing that existing
businesses exhibited higher rates of employment growth per annum, although increased productivity was not confirmed.

Arezki et al (2011) showed that economic diversification is known to result in better performing economies over the long-term for resource-dependent communities. With the expansion of the Prince Rupert port area and a new privately owned $70M port facility at Stewart, B.C., combined with the new Northern Transmission Line from Terrace to the Golden Triangle where many metal deposits are located, the region is well positioned to foster growth and economic diversity. For example, the Port of Prince Rupert currently offloads and facilitates shipments of coal, grain, wood pellets and logs (Port of Prince Rupert, 2016) and has the potential to ship other goods to Asia and the U.S.A.

Q1 showed 62% of Kitsumkalum members agreed they would like to start their own business (6 to 10 in the Likert-like scale), with 51% providing more than 100 different ideas on the types of businesses they would like to develop (Figure 19). Most people prefer the service-related occupations such as advocate, consultant, mechanic, engineer, coffin manufacturer, interior decorator, taxi, internet service provider, welding, makeup artist, management, party planner, private counsellor, medical marijuana, recycling, safety, saw sharpening, security, secretarial, tow truck company, hostel, sawmill planer, aquaculture, secretarial, and cleaning. The construction and food/beverage industries were also of interest to many members. Regardless of the type of business identified, it is important to facilitate the progression of these ideas into a potential business opportunity through mentoring and market analysis. In addition, to promote economic sustainability, care must be taken to ensure that a new business can survive beyond the five-year construction phase of one LNG facility. Interestingly, the proposed business ideas were similar to the education and training results, where a trades vocation was chosen as the most desirable job, which is likely due to the belief that high-paying LNG jobs would be available soon.

While some individuals will definitely require financing to start their own business, others may need business start-up and maintenance training. Support through entrepreneurial mentors would benefit people and provide them with the best opportunity for success, providing the type of business and level of service will meet market demand.
As mentioned previously, the ETE subthemes of ‘creating shared value’ and ‘increasing business capacity’ were deemed to be important by the mining (86%), LNG and economic sectors (60% each). It appears that shared value and increased business capacity could be achieved through the implementation of local content measures. Local content can be defined as the resource development’s contribution to locally-owned or locally-based companies, the value contributed to the economy through the purchase of goods and services, or the benefits derived from training and employment of the local workforce (Esteves et al, 2013). Local content benefits include preferentially hiring local people and companies to increase capacity through working with international oil, gas and mining companies (Esteves et al, 2013). Providing local content benefits is important for companies, as it greatly improves their chances of obtaining their social license to operate (Esteves et al, 2013). As discussed at the Tsimshian Alliance meetings, there is an expectation by First Nations people, who have rights and title in the region, to be “first on the bus”. This means, if qualified, First Nations would be hired first for LNG jobs.

<table>
<thead>
<tr>
<th>Tourism</th>
<th>Service related</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Retal</td>
</tr>
<tr>
<td></td>
<td>Healthcare</td>
</tr>
<tr>
<td></td>
<td>Forestry</td>
</tr>
<tr>
<td></td>
<td>Food and Beverage or Catering</td>
</tr>
<tr>
<td></td>
<td>Financial Services</td>
</tr>
<tr>
<td></td>
<td>Education and Research</td>
</tr>
<tr>
<td></td>
<td>Construction</td>
</tr>
<tr>
<td></td>
<td>Caring Services (children/elderly)</td>
</tr>
<tr>
<td></td>
<td>Art</td>
</tr>
</tbody>
</table>

**Figure 19.** Types of businesses Kitsumkalum members are interested in starting n=102.

---

18 The social license to operate refers to the level of acceptance or approval by local communities and stakeholders of mining companies and their operations (miningfacts.org, 2017).
Governments benefit from local content initiatives and resource revenues in the form of royalties and taxes (Esteves et al, 2013). Kolstad and Kinyondo (2016) argue that governments should reduce the focus on local content requirements and increase royalties and tax revenues, so that investments can be made to develop other more sustainable industries.

While resource companies like to practice socially-responsible behaviour through the provision of work contracts to local businesses, the long-term survival of any business requires good accountability and competitiveness. However, only 40% of the LNG sector and 13% of First Nations mentioned the need for contractors to be competitive. However, the World Trade Organization (WTO), with 164-member countries, has local content rules for goods and supplier contracts. Essentially, a contract cannot be awarded unless it is internationally competitive in terms of price, quality and delivery. Despite this, there are ways to encourage local content by reducing pre-qualifications for domestic suppliers, requesting that all bidders conform to minimum training obligations and only awarding contracts to those with the highest level of local content (Warner, 2011). Although the purpose of these WTO rules is to avoid poor business performance and competitive ineffectiveness, a need for local content has been recognized, especially when compensation is demanded, due to the occurrence of environmental impacts (Warner, 2011). Furthermore, Warner (2011) claims the WTO will accept some form of protectionism, provided it is short-term.

Some countries, like Australia and Malaysia, have enacted legislation and developed policies to facilitate local employment, while at the same time maintaining compliance with the WTO rules (ccc 2016; 2015). In comparison, B.C. and Canada do not appear to have local content legislation or set policies for the extractives industries. Furthermore, unless specified as a condition of an individual project negotiated between parties, there is no requirement for international companies to commit to local content in the environmental assessment process or through project agreements.

In the case of LNG, employment and contracts are short-term during the construction phase and highly specialized. If LNG companies commit their social investment funds to building up local content and helping businesses develop regional
linkages, it may be difficult for employees and contractors to transition into other jobs and contracts beyond construction. Conversely, the training, work experience and contracting jobs acquired during the construction phase can increase capacity for future work and business opportunities.

With reference to the mining sector, Esteves and Ivanova (2015) identified that one of the social risks and potential impacts arising from local small and medium enterprises servicing the sector is the exposure to a potential bust when commodity markets decline. It was also noted by the authors that resource-dependent communities should identify which industries are best suited to operate within the region.

Haddow (2014) describes the need for mining to act as a catalyst for economic diversification, as there is enormous potential for rapid socio-economic transformation through large resource development projects. Recognizing that mining companies should not be forced to pay for developmental costs within a country where a project is slated to go ahead, Haddow (2014) acknowledges that a relatively small investment can result in good value for both the local communities and mining companies. In comparison, a mining industry representative stated that financial input into a region due to mining development can be a positive catalyst for the initiation of other businesses, which will hopefully be able to transition upon mine closure.

Some mining companies hire business development managers specifically to help Indigenous Peoples in the region foster independent business initiatives. New Gold implemented the Enterprise Facilitation™ approach at its Peak Gold Mine in Cobar, Australia, where the program helped create 43 new businesses and assisted the expansion of ten (McFaul et al, 2013). In doing so, New Gold is now confident that these businesses will survive beyond mine closure.

Dr. Sirolli’s Enterprise Facilitation™ approach includes assisting individuals start up a business, while at the same time recognizing that marketing, financial management and hard work are essential in order to generate success (Sirolli, 2012). As it is extremely rare that any one person has talents in all of these three areas, Sirolli recommends
constructing a solid work team composed of committed individuals who can work well together and know how to delegate.

A mining industry representative stated that Aboriginal Peoples need to take advantage of increased economic activity while a mine is currently operating, in order to spur diversification and create new opportunities for both training and businesses. The example provided was to initiate a laundry service for a resource development, which would help to develop entrepreneurial skills. In time, the business could branch out to service other clients as well, resulting in diversification of their client base. According to the mining sector, if contracts are small and business development facilitators are available to help people start and maintain their own businesses, then small companies could begin servicing other developments, either as a joint venture or independently, while at the same time developing other markets. This way, when the service or product is no longer required, the company can transition into serving other markets.

Another important factor related to the development of new businesses to service the LNG industry is the implementation of necessary default insurance, which has to be in place in order to cover the cost of construction. To address this issue, some LNG companies are requesting their contractors to partner up with First Nations, although subcontractors often find ways to avoid this commitment. The lack of trust is certainly an issue, as expressed by an economic development representative, who felt that major industries need to stop simply “paying lip service” to First Nations and residents and commit to providing realistic and reasonable economic development opportunities.

Although 62% of Kitsumkalum respondents to Q1 expressed desire in opening their own business, access to capital was mentioned during the interviews as one of the major barriers to overcome. Similarly, Krupa (2012) noted this as a major barrier to renewable energy development by Aboriginals in Canada. One of the examples mentioned from the interviews was regarding a fisherman who wanted to start canning smoked fish, but didn’t have any access to start-up funds for a small business. If bands were able to borrow money at government rates, one First Nations representative commented that this would greatly facilitate economic development for Indigenous Peoples.
Currently, few programs exist in northwest B.C. to assist people in developing their own business ideas. In 2014, one of the proponents of a proposed LNG project in Prince Rupert (BG Canada) partnered with Futurpreneur Canada to implement ThriveNorth, a five-year program aimed at providing business opportunities for people 18 to 39 yrs. old in northwest B.C. (Futurpreneur, 2017). This program provides business training, short courses, mentoring and business planning to assist individuals with their business ideas and help in accessing start-up financing (Futurpreneur, 2017). Tricorp (Tribal Resources Investment Corp.), a non-profit corporation based in Prince Rupert, is owned collaboratively by the seven northwest B.C. Aboriginal Governments, which provides business loans and training to Aboriginal Peoples in northwest B.C. (Tricorp, 2017). While these types of services are valuable, it is also important to offer individualized business market coaching in order to help develop a sound, viable business plan when approaching a bank or another lender institution to ask for credit, or when a marketing strategy could be better devised to plan for the post-construction phase. McFaul et al (2014) describes the Universal Management Principals to help people succeed in business, which include: an initial passion for producing something of value to society; determining the costs associated with producing and selling; and studying the marketplace to understand how well it would fit in the marketplace.

Developing partnerships between established businesses and First Nations is an excellent way to work towards economic and social sustainability for local communities and the region. This kind of partnership is mutually beneficial, as it provides more opportunity for local and regional businesses to access contracting opportunities often available through First Nations/Industry Impact Benefit Agreements and increases the qualification aspect for contracts, as companies typically have the required expertise and experience. In Terrace B.C., The Terrace Economic Development Association (2012) has developed a toolkit to assist businesses who want to develop a working relationship with local First Nations, in order to provide goods and services to industrial developments anticipated to be moving into the area. Different types of agreements are presented, as well as templates and contact information for the various First Nations leaders within the Stikine-Kitimat and Skeena-Queen Charlotte Regional Districts.
The LNG industry requires businesses that do contract work for them to be very professional in their organization and dealings, even for small to medium-size enterprises. For a massive LNG construction project, all contractors and subcontractors would have to have ensured guarantees with their promised deliverables, in order to guarantee viability of the development. Meeting these high international standards, where small contracts are not available or accessible, creates a barrier for First Nations businesses, especially if there are no commitments regarding contracts in a signed IBA. One way to achieve First Nations participation in resource developments is through the contracting process, which would make it mandatory for contractors to establish joint ventures with First Nations, ensuring some employment opportunities for Indigenous members.

For example, the Diavik Diamond Mine in the Northwest Territories of Canada signed partnership agreements in 2003, committing to providing benefits in the form of training, employment and business opportunities to local Aboriginal groups, which resulted in approximately 35% of the workforce being Aboriginal and two-thirds of contracts being awarded to Aboriginal businesses (Zhang and Swanson, 2014). Conversely, in Iqaluit, Nunavut, Canada, where economic development after treaty resolution was left to market forces, new businesses were developed, owned and operated by non-Aboriginals, and the Inuit population either work in wage labour or are exercising traditional harvesting activities on the land and water (Zhang and Swanson, 2014).

Other positive examples can be seen from the Osoyoos Indian Band and the Westbank First Nation in the southern Okanagan region of B.C., who both took proactive approaches to business development. The Osoyoos Band, utilizing its 32,000 acres of reserve land as a resource base, started a corporation managed by Chief and Council and hired skilled and experienced people who were not necessarily band members to manage and operate the businesses (Zhang and Swanson, 2014). The Westbank First Nation, instead of creating and operating their own businesses, issued certificates of possession to on-reserve land holders for leasing the land to developers, which, in turn, created wealth for their members to develop their own businesses (Zhang and Swanson, 2014). Facilitating business development for bands and members through on and off-
reserve services is essential. Training and the facilitation of reasonable business loans, access to joint ventures and partnerships will also help in establishing new Aboriginal businesses.

It is clear that strategic planning and implementation could provide for improved transitioning between construction and operation phases, through the creation of shared value from local content opportunities and increasing business capacity for the Nations and its members, while at the same time diversifying the economy to become more economically sustainable.

In order to diversity the economy utilizing opportunities through local content initiatives, a firm commitment from large resource development companies, their contractors and subcontractors is necessary. In Norway, government legislation has forced foreign oil development companies to use local procurement in order to avoid what is known as the Dutch Disease; a condition common in resource-rich countries prior to 1970, where export sectors declined due to an increased influx of foreign currency and decreased competitiveness. Norway’s legal tools enabled the development of the industry for the benefit of Norway, while protecting the environment at the same time. Norway recognized the need to develop longer-term industrial developments and increase the knowledge and goods within the country, so that the economy could endure beyond the shorter-term revenues generated through petroleum taxation and jobs (Hunter, 2014).

Australia, during the same time that Norway was diversifying its economy, relied on market forces for diversification, with policies focussed on providing investor security and promoting the benefits of resource development for Australians (Dept. of Primary Industries, 1990, pg. 1 in Hunter, 2014). Australia, after its US $200 billion expenditure on several LNG developments, is currently contemplating how it can export its services internationally, citing Norway’s success in developing its oil service sector (Dediu et al, 2016).

Indigenous Peoples, as part of their governance role, could develop and implement resource development policies in agreement making with governments and industry, which would be applicable to their respective territories. Indigenous Governments should
not leave their economic development to market forces, as their rights and title to the land and water need to be respected and compensated accordingly. If the strength of claim is properly assessed in a transparent way, and the Nation has rights and title to the area, the Nation can negotiate fair CDAs and IBAs that ultimately foster long-term careers and businesses, inclusive of business development training and assistance.

Similarly, in order for LNG companies to gain their social license to operate, Indigenous Peoples and the public can request that a transitioning plan be developed and implemented to mitigate socio-economic impacts associated with the end of the construction phase. This type of plan would fit into the need for the extractives industry to move beyond their contributions to transformation sustainability, where social issues are only addressed during the active phase (mining operations or LNG construction), to transitional sustainability, where sustainability beyond these phases is considered (Onn and Woodley, 2014). In doing so, components of a transition plan could be developed using the ten elements identified by Xavier (2013) as being important for a socio-economic mine closure framework, which included: policy (corporate), presence, participation, planning, performance, promotion, perseverance, patience, passion and personality.

Besides efforts made to diversify the economy through local content and preparing for the bust phase of large resource developments, it is also important to promote place-based development, as identified by Halseth et al (2014), which would attract investment and qualified people to the area. Markey et al (2008) argue that the B.C. Government has historically extracted funds from resource development projects in the northern part of the province to help pay for infrastructure and services in southern B.C., with very little attention placed on the need for reinvestment regarding future economic opportunities in the north. Place-based development is now possible with the advent of technology and globalization, where investments can be made in almost any geographic location (Halseth et al, 2014). However, this type of development requires more investment in local infrastructure and services to attract people and new businesses.

As shown by the mobility data collected in Q1, most First Nations Peoples do not want to relocate permanently and are not even willing to leave home for several weeks at
a time for work opportunities. Therefore, in order to increase job opportunities closer to home, First Nations groups, in partnership with municipal governments, need to attract more investment to the area, which would also help to increase funding for infrastructure and services such as roads, swimming pools, hospitals, ice rinks, etc. These types of services would not only benefit the region but also attract investors and increase the potential for development projects, which would contribute to the long-term sustainability of First Nations communities through the provision of more career and business opportunities.

A positive example of potential place-based development occurring in the northwest region of B.C. involves the technological sector, whereby businesses in the Lower Mainland could soon be setting up branches in Terrace, as new fibre-optic wiring for internet is currently being installed (to be completed by the end of 2017). This will place Terrace on the same level as other large urban areas in the Province in terms of internet speed and capabilities, which will definitely help to attract new and enhance established businesses. The promise made by the B.C. Government in early 2017 to build a new hospital in Terrace will also help to develop the regional economy. However, in order to attract educated and skilled people to the region and increase local capacity-building, it is clear that more resources are required for improved education and healthcare services. Although Terrace, Prince Rupert and Kitimat are beginning to attract new businesses to the area through the promotion of available tourism and recreational opportunities, relatively affordable housing, as well as other amenities, assistance from the Provincial and Federal Governments is needed to address some of the deficiencies in local infrastructure and services. In order to attract people from the Lower Mainland or elsewhere or to build human capital locally, improvements to secondary and post-secondary education and health services must be implemented, as these are basic requirements for individuals and communities to prosper.

Through extensive consultation by the University of Northern British Columbia with northern B.C. residents from 2002 to 2004 and from 2009 to 2011, a new vision and strategy was identified to foster renewal of the economy over the long-term. While it was recognized that economic development initiatives need to be assessed in conjunction
with the community, together with discussion regarding socio-economic, environmental and cultural effects, people overall felt that more investment was needed in order to transition to a more robust and diversified economy. This would include improvements in various kinds of infrastructure, improved human capacity and support for local voluntary groups involved in community development and community economic development (Halseth et al, 2014). However, it can be challenging to access the necessary funds for these investments, as municipalities and regional districts are often unable to tax resource developments, due to the location of headquarter offices being outside the legal jurisdiction where the developments are taking place (Heisler and Markey, 2014).

In August 2015, 21 municipal governments in northwest B.C. joined together as the Northwest B.C. Resource Benefits Alliance to lobby the Provincial Government for a share of resource development revenues, in order to address community needs and impacts associated with these developments. However, no discussions have ever taken place between the Alliance and the Province, despite repeated requests from the Alliance to schedule meetings (NCLGA, 2017). In comparison, fund-sharing has already started among seven municipalities and one regional district in the Peace River region, after the signing of a 15-year agreement with the Provincial Government in 2005 to access tax revenues from developments outside municipal boundaries for help in financing infrastructure and service needs (Fort St. John, 2016). Access to revenues from resource developments outside municipal boundaries will be important for municipalities like Prince Rupert, where tax revenues are capped by the Provincial Government for port-sited industries and are assessed according to the Port Authority’s assessed value conducted by a third party, rather than by the normally higher value assessed by the B.C. government (KPMG, 2015).

4.2 Governance

Results from all 31 interviews (Table 7) showed Governance to be the second most mentioned Theme, behind ETE. While First Nations (50%) and the government (83%) sectors felt strongly that First Nations should lead the way to sustainable development in their communities, the subtheme of ‘working together and improved coordination’ was highly raised by the LNG (80%), government (67%), economic development (60%), and
mining (57%) sectors more often than the First Nations (25%), as shown in Table 11. These results show a strong division in views between government organizations and business organizations on how governance should be administered to move First Nations communities towards sustainable development and increased resilience.

Good governance is required by all levels of government, including First Nations and corporate entities, to facilitate the enhancement of benefits and minimize impacts from large resource developments and move communities towards sustainability. However, during the interviews, good governance was raised mainly in the context of First Nations leading the way to sustainable development within their communities. The Federal and Provincial Governments ranked governance as No. 1 tied with ETE, while First Nations ranked governance third. For industry representatives, governance was ranked fourth, while no one from the economic development sector felt it was important. These results may be attributable to the notion that large resource developments inherently come with opportunities for education, training, employment and contracting, which all contribute to long-term sustainability. However, it is clear that the onus is on First Nations to use these opportunities to help govern themselves better and improve their living conditions over the long-term. However, even with good governance, unless a Nation is fortunately endowed with significant natural resources and has good access to markets, which positions them well to negotiate a lucrative IBA with developers, it can be difficult to improve the socioeconomic conditions of their members without assistance from outside the Nation and through cooperation with others. For some Nations with low internal capacity, due to poorly-developed human capital to leverage from the benefits provided in an IBA, support from industry and government is absolutely essential to increase opportunities.
<table>
<thead>
<tr>
<th>Subthemes</th>
<th>Federal &amp; Provincial Gov. Combined (n=6) (%)</th>
<th>First Nations (n=8) (%)</th>
<th>LNG (n=5) (%)</th>
<th>Mining (n=7) (%)</th>
<th>Ec Dev (n=5) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Governance Theme. Rank = 2</td>
<td>83</td>
<td>50</td>
<td>80</td>
<td>57</td>
<td>60</td>
</tr>
<tr>
<td>1.First Nations need to lead the way</td>
<td>83</td>
<td>50</td>
<td>20</td>
<td>29</td>
<td>20</td>
</tr>
<tr>
<td>2.Working together with improved coordination</td>
<td>67</td>
<td>25</td>
<td>80</td>
<td>57</td>
<td>60</td>
</tr>
</tbody>
</table>

### 4.2.1 FNs Need to Lead the Way

B.C. First Nations leadership at the hereditary chief level is inherited through family lineages and the hierarchy is well respected in the tribes. Before European contact, the male in line to inherit title to a portion of the Nation’s territory was obligated to provide gifts to other title holders at a potlatch feast, where rejection of the gifts could occur if the other title holders felt that this individual was not an appropriate choice for hereditary chief (Trosper, 2003). Today, there is confusion within some Nations on the process associated with the assignment of hereditary chief status, as colonization effects have resulted in the loss of knowledge regarding the traditional governance system. However, some Nations have managed to maintain the knowledge and, as a result, their hereditary system is strong and effective, while others are working towards fully reinstating use of their traditional knowledge and governance systems.

The elected band system imposed by the Indian Act may be inferior to the hereditary chief system. For some nations, the elected chief and council are often members of the largest family in the Nation and for larger Nations, chief and councils can change from one family to another every two yrs.¹⁹ Therefore, smaller families do not have fair representation during elections. If each clan or house had equal voting power, then families would be better represented in the election process. This type of electoral

---

¹⁹ Most bands in B.C. are under the Indian Act for election of leadership, where elections are to take place every 2 yrs. however, some are under the First Nations Election Act, where elections would take place every 4 yrs.
system would be similar to the electoral process in B.C., where geographic regions elect a representative of government belonging to a particular political party. Then, the party representing the largest number of regions is elected to lead the province. For a First Nation, leadership of geographic areas within a territory are often divided by watershed basins, where the resources found within the territory are managed by the house leader or hereditary chief.

Regardless of the First Nations governance structure, it is imperative that every Nation have a solid administrative, social, economic, and environmental governance in place to lead their membership collectively towards sustainable development.

Since 1987, the Harvard Project on American Indian Economic Development has been researching “What Works, Where and Why?” (HPAIED, 2017). One of the key findings is that leadership is key, as Nation-building requires leaders to convince people to take action in their own lives based on new knowledge and experiences, while at the same time challenging assumptions and proposing change. The research conducted by HPAIED has shown leadership to be an essential element to good governance and that good governance is a pre-condition to long-term sustainability in First Nations communities (NCFNG, 2007).

Governance, as defined in the literature review, is the authority to manage political, economic and administrative affairs. Politically, First Nations leadership is obliged to continue to assert the rights and title within their claimed territory boundaries as a service to its membership. Administratively, the exercise of power through the asserted rights and title can be accomplished through agreement-making. A clearly defined process for agreement-making with governments and industry would benefit all parties, inclusive of capacity funding required to negotiate, who will be negotiating on behalf of the band, and steps to be taken during the negotiation process. Some bands in B.C., like the Tahltan Nation in northern B.C., have a written defined protocol as a component of their Resource Development Policy (Zimmerling, 2016).

Economic governance is key to building a sustainable future, as there must be a balance between funding social, cultural, economic and environmental initiatives to bring
people out of poverty and progress towards sustainable development. To avoid the resource curse phenomenon associated with large-scale resource development, governance or institutional capital are essential to expand the local and regional economy beyond resource extraction and export (Arezki et al, 2011). Governance policies favouring certain sectors are likely necessary for resource-dependent economies, as market forces often result in a continued dependence on non-renewable extractive industries (Arezki et al, 2011). The same is true for First Nations governments, where young people need to be encouraged to focus on training programs through government policies and management initiatives, such as post-secondary education and career-oriented jobs, rather than part-time construction or seasonal work, which typically requires very little education or training.

Similar to any government structure, First Nations governance requires strong legal and institutional frameworks for contract negotiations, together with transparency and accountability, in order to ensure that natural resource development projects are implemented in an environmentally and socially responsible way and resource revenues are utilized effectively. Important aspects of such a strategy include the need for transparent and productive use of revenues and managing the volatility of revenues, while investing in economic diversification, human resources, social services, and infrastructure.

In general, although resource-dependent countries are correlated with low economic growth, nations with strong human capital and quality institutions with good governance can create more diverse economies over time (Lederman and Maloney, 2007). Malaysia, Indonesia, Chile and Dubai are positive examples of developing countries with economies that have diversified and evolved, due to investments generated by the mineral sector (Arezki et al, 2011). Chile stabilized its financial position by saving during the copper-boom years, which allowed it to rely on its financial reserves when metal commodity prices declined in recent years. Chile also encouraged the development of the salmon and wine industries, through the establishment of private-public partnerships and the fostering of information-sharing to attract new foreign businesses (Arezki et al, 2011). Although B.C. First Nations governance is not equivocal
to the national governance level of countries, the concept of utilizing resource revenue funds to invest in sustainable business is the same. Several B.C. First Nations have utilized funds and entered into joint ventures to build businesses to diversify the economy and build sustainable businesses, such as the Osoyoos and Westbank Bands (Zhang and Swanson, 2014). For more remote communities, economic diversification can be challenging. However, with benefits derived from large resource developments, capital can be invested and existing transportation networks utilized to ship new products to Asia and the U.S.A. through the ports at Prince Rupert or Stewart (see Section 4.1.4).

Although some countries like Botswana have been able to effectively manage their resource development revenues, resulting in net GDP growth per capita, the overall disparity between rich and poor sectors of the population in terms of quality of life has increased over time. Furthermore, the IMF found that resource development projects in Botswana have made little progress in fostering economic diversification, thereby compromising long-term sustainability (International Monetary Fund, 2012 in NRGI 2015b). Conversely, Dougherty (2011) claims that Botswana’s fiscal policy has allowed for a fairly equitable distribution of benefits, which significantly increases access to education and health services. First Nations governments, with the use of periodic socio-economic surveys as utilized in this study, can effectively monitor their populations to address disparity within the band and provide programs specific to those in need.

In Alberta, the Heritage Savings Trust Fund was established in 1976 to collect revenues from non-renewable resource developments in order to save for the future, diversify the economy and improve the quality of life for people living in the province. However, the fund resulted in less money accumulating over time when compared to a similar initiative set up in Alaska, as funds were withdrawn to invest in non-financial investment goals, which ended up reducing the long-term equity of the fund. Despite Alberta’s $31.3 billion income in 2011, its fund only held $14.2 billion, while Alaska’s had $41.6 billion (Murphy and Clemens, 2013). Since then, major declines in oil prices, rise in unemployment, combined with fires and floods in resource-important regions, have caused a serious dampening of Alberta’s economy, leading to financial difficulties, constraints in social spending, and a 30% increase in suicide incidents during the first six
months of 2015 (CBC, 2015a). As a countering measure, First Nations groups could offer financial literacy courses to its members to assist in deterring members from making poor financial decisions in times of economic difficulty, as financial strain can cause depression, which sometimes leads to suicide.

As stated in Section 2.3.1, there are governments throughout the world and in North America who govern and manage their resource revenues to moderate boom-bust dynamics. In contrast, some governments at the management level struggle with mitigation of the negative socio-economic impacts caused by the cyclical nature of the extractives industry (Arezki et al, 2011). For example, Ghana have enacted laws in 2011 to manage petroleum resource revenues. However, in the case of Ghana, these laws did not transfer effectively to improved management and the provision of long-term benefits for the country (Lwabukuna, 2016). Despite detailed regulations and a commitment to utilize petroleum revenues for improved socio-economic conditions among the country’s poor populations, Ghana ended up having to borrow and spend excessively, which led to severe economic decline when oil prices fell. Similarly, First Nations governments and leaders need to use resource revenues derived from forestry, oil, gas and mining resources in their territories to effectively manage their populations, implement effective programs and improve their standard of living. However, in many cases, the Chief and Band Council have the authority and discretion to spend those resource revenues freely. Therefore, in order not to compromise long-term economic sustainability of First Nations communities, it is essential that a good fiscal balance is achieved in relation to spending on socio-economic initiatives, including housing, job creation, ETE programs and business opportunities.

Another important government function is to develop sound environmental policies, which will assist with sustainable use of the land and provide guidance to resource developers. The Comprehensive Community Planning process, funded by the Federal Government, facilitates community input to the Nation for future governance, land and resource use, health services, infrastructure development, culture, and social and economic development, which is then endorsed by the leadership (AANDC, 2016a). The results from this process will contribute to land-use planning and the development of a
land code to facilitate the eventual governance of the bands Indian Reservation (IR) lands\textsuperscript{20}.

The Land Code development process for administration of IR lands is another step towards self-governance for First Nations. A land use plan is developed through engagement with the community and is ratified by the community before the Land Code is adopted. Once adopted, the band is able to enact laws pertaining to the land, whereby INAC no longer has any jurisdiction over land-use decisions pertaining to the band’s IRs. If, and when a treaty is signed with the Federal and Provincial Governments, the land code could then be applied to treaty lands. Alternatively, or additionally, the land code could be utilized to develop environmental policies for beyond treaty lands within the Nation’s territory.

Some First Nations have developed resource management policies for companies and government to adhere to while exploring and operating within their respective territories (Zimmerling, 2016). For example, due to the mine tailings dam failure at Mount Polley, B.C. in August 2014, the Northern Secwepemc te Qelmucw Leadership Council, representing four First Nations groups around the Mount Polley mine area, drafted a Mining Policy effective November 19, 2014. The policy is comprised of 13 sections and includes guiding principles, decision-making processes, agreements with proponents, environmental assessments, permitting and approvals, and all phases of mine development, including enforcement, security, crisis management planning and dispute resolution (Zimmerling, 2016).

In April 2016, various B.C. communities expressed their desire to enact a water policy using traditional laws (APTN, 2016). In turn, the elected leadership from Nadleh Whut’en and Stellat’en First Nations proclaimed the water management regime as law within their territory, which was enacted in opposition to the proposed Northern Gateway pipeline project (APTN, 2016).

With improved governance structures, First Nations communities will be well positioned to benefit from large resource developments while minimizing impacts.

\textsuperscript{20} Indian Reservation Lands are currently governed by Indian and Northern Affairs Canada
Furthermore, the development of resource management policies and a process for agreement making will provide more certainty to both industry and the Nation with respect to project approvals and the associated mitigation and compensation measures.

4.2.2 Working Together with Improved Coordination

While it is important for First Nations leaders and governments to find ways to empower their membership and move towards sustainable development through ETE, addressing social issues, providing supports, and developing policies, equally important is greater certainty regarding project approvals for large resource development projects for both industry and First Nations.

Without certainty, the likelihood of projects being constructed is reduced limiting opportunities for the region to sustainably develop. Uncertainty for industry is in the form of project approvals that may be overturned by the courts as the statutory decision maker attempts to determine if an infringement on Aboriginal rights and title is justified (Meech et al, 2014). For First Nations, although CDA and IBAs are sometimes signed, the uncertainty is not knowing if benefits will outweigh the negative impacts from large industrial developments.

Working together with improved coordination was a Subtheme identified indicating there is a need for improved governance by all parties involved. To reduce uncertainty in project approvals and their outcomes in terms of benefits and impacts to First Nations there must be shared decision making and partnerships developed between industry, First Nations and governments. Working together with improved coordination means creating a better understanding of the needs of each party to maximize benefits and minimize impacts and working together to achieve this through the identification of goals and objectives from project inception to beyond closure.

Good corporate and public governance is needed for industry and government respectively to ensure shared decision making and partnering with First Nations is occurring at all levels of the organization. Although working together with improved coordination was a Subtheme identified by 80% of LNG representatives, 67% of government, 60% from the economic development sector, 57% from mining, and only
25% from First Nations, it was mentioned in the context of all sectors working together to facilitate ETE opportunities and improve health outcomes for First Nations or as a need for First Nations to work with each other more often. Swain (2016) recommended specifically that Nations work together to sort out their traditional and shared territory boundaries. Only one mining representative mentioned shared decision making but qualified the statement: “as appropriate”.

Although a LNG representative stated their commitment to request contractors work together or partner with First Nations, while others interviewed discussed the need for companies to partner with First Nations, a mining representative noted their joint venture contracting arrangement was not successful in increasing ETE capacity as no members from the band worked at the company. The mine then hired a business development officer to assist Aboriginal Peoples with business development opportunities beyond the mine, which brought about more success.

As discussed in Section 2.3.1, many Aboriginal groups with a strong claim for title (owners of the land) in their respective territories continue to be left out of the decision-making process for project approvals. Although several consultation guides have been produced by the Federal and Provincial governments, beyond the consideration of significant environmental effects resulting from the proposed project, the approval decisions made by the Crown continues to rely on the Crown’s determination of the affected First Nations’ strength of claim, and the depth of consultation conducted for the project. If environmental impacts do infringe on an Aboriginal groups rights and title, then a determination must be made by the statutory decision makers whether the infringement is justified. Justification of an infringement must consider whether project benefits to society outweigh First Nations impacts to their rights and title inclusive of future generations (Rosenberg and Dickson, 2016). Clearly, the decision is subjective and open for interpretation by others. An economic development representative noted “We need meaningful province and federal policy post Tsilhqot'in decision. There is a lot of confusion and it is challenging for investor certainty”.

Additionally, policies and guidelines implemented at the local consultation level often fall short of what is required according to case law. As each case is decided, the
definition of Aboriginal rights and title in B.C. changes. Therefore, the Provincial and Federal governments are continually required to change the way they engage with Aboriginal Peoples. Meech et al (2014), discussed several B.C. mining projects, where First Nations concerns resulted in preventing several projects from moving ahead. These concerns are often related to the proposed location or proposed activity where predicted or perceived effects to important spiritual or harvesting areas are deemed by the Nation to be significant. Swain (2016) in his report to the Privy Council noted uncertainty related to mining project approvals as a deterrent to investment. While several First Nations in B.C. are interested in working with industry as they are cognizant of the benefits that can be realized for their people in the short and long-term, each Nation is different in terms of their vision for the future and their long-term sustainability objectives and goals.

Opposition to projects is not specific to mining in B.C. Currently, internationally, the oil and gas industry is receiving opposition by many different Indigenous communities for project proposals or violations of Indigenous rights, as demonstrated by a study of 330 extractive industry projects worldwide. In this study, one of the reasons for such opposition was the noted lack of commitment by industry to Free, Prior and Informed Consent through its industry association (First Peoples Worldwide, 2014). In some cases, B.C. appears to be more progressive with the new LNG industry demonstrated by the recent partnership agreement between Steelhead LNG and Huu-ay-aht First Nation where they will co-manage the Sarita LNG project from design through to closure (Steelhead LNG, 2017). The willingness for industry to work with First Nations from the assessment stage through to post-closure, in order to maximize benefits and minimize impacts and obtain/maintain a social license to operate, reduces the risk of delays or cancellation of the project through enhanced community support (Henisz et al, 2013). Industry would be at an advantage knowing that government policies regarding consultation and accommodation of affected First Nations is often outdated because of the frequent court challenges and the difficulty in creating new guidelines emanating from higher levels of government.

Court challenges are often a direct result of the interpretation of case law to date by the Provincial and Federal Governments. The consultation process is based on “ticking
boxes” as stated by many First Nations who participate in the process, rather than finding ways to accommodate infringement on Aboriginal rights and title as required by case law. While accommodation is sought through agreement making, not all Nations are interested in signing agreements, or are of the mind that the negotiations have resulted in fair accommodation. At the end of a lengthy engagement process, impacts will be deemed either significant or insignificant by government representatives, the government statutory decision makers will review reports and assess whether the depth of consultation has been adequate, and if he or she believes any potential infringement on Aboriginal rights and title is justified, the approval will be granted. If the Nation challenges the approval in court, the decision has the potential to be overturned.

Despite the usefulness of IBAs providing some certainty for both companies and First Nations about the projects, these agreements may not include shared decision making or partnering to move towards a sustainable future. Veiga et al (2001) suggests communities need to be partners in decisions that affect their lives before sustainability can be achieved. The authors further state that local capacity-building combined with local governance inclusive of other community members, not just politicians would move communities towards sustainability. However, shared decision making on project approvals is not possible if government is not willing to make this change. Industry is left with trying to negotiate agreements that will reduce opposition to their project, sometimes failing to do so as the affected Nation may have pointed issues with the development or have other side issues with the government preventing the finalization of such agreements.

Provincial and Federal, corporate and First Nations governance could be improved in various ways. As discussed in the IBA Toolkit (Gibson and Fairchellaigh, 2010), the “no option” must be considered by all parties to be a viable option at all stages of negotiation. First Nations potentially affected by a project need to understand fully what the benefits and impacts will be arising from a project before they decide if they are in support or not.

Governments and corporations should recognize that strength of claim or potential impacts on First Nations rights and title may change depending on how the strength of claim and impacts are assessed. Governments rely on such assessments to guide their
consultation process and provide advice to corporations on the depth of consultation required for each potentially affected First Nation. However, these assessments may be incorrect as the strength of claim is conducted by the government(s) and may not include all relevant traditional rights and title information. Potential impacts resulting from the project are identified by the corporation’s consultants, and may not account for the significance of a particular impact to a Nation. Providing the opportunity for all those who feel they will be affected by the project and to what extent would reduce the risk of unforeseen issues arising as the project approaches a decision for approval.

First Nations governance can be improved by providing government and industry with an established community derived and approved protocol of consultation, inclusive of the process of negotiating CDAs and IBAs. Additionally, improved First Nations governance for some communities would include an economic policy derived and approved by the community where revenues, business and job creation, in addition to prioritized spending is outlined. The policy would also include a communications plan ensuring transparency with members of the First Nation.

4.3 Social Issues and Barriers

While the ETE Theme was ranked collectively by all sectors as No. 1, individually all sectors ranked ETE as No. 1 except First Nations, who ranked Social Issues and Barrier as No. 1 (75%) followed by ETE (63%) (Table 7).

The Social Issues and Barriers Theme, was ranked as No. 3 by all sectors with three common Subthemes as shown in Table 12.

4.3.1 Cultural Issues and Racism

Mining (71%), LNG (60%) and economic development representatives (60%) spoke about cultural issues and racism as a potential barrier in the workplace. These three sectors felt cultural awareness training is important to implement in the workplace to minimize racial conflict. It appears Kitsumkalum members are affected by racism within their community somewhat as results from Q2 showed 36% Kitsumkalum disagreed (Likert-like scale of 0 to 4) they have not experienced racism in the workplace, while 34% were neutral (Likert-like scale = 5) and 30% agreed (Likert-like scale 6 to 10).
Table 12. Common Subthemes for Social Issues/Barriers Theme

<table>
<thead>
<tr>
<th>Social Issues and Barrier Theme</th>
<th>Federal &amp; Provincial Gov. Combined (n=6) (%)</th>
<th>First Nations (n=8) (%)</th>
<th>LNG (n=5) (%)</th>
<th>Mining (n=7) (%)</th>
<th>Ec Dev (n=5) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rank = 3.</td>
<td>33</td>
<td>75</td>
<td>60</td>
<td>71</td>
<td>60</td>
</tr>
<tr>
<td>Subthemes:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Cultural issues and racism are barriers</td>
<td>33</td>
<td>13</td>
<td>60</td>
<td>71</td>
<td>60</td>
</tr>
<tr>
<td>2. There are social/historical barriers: housing and access to healthcare</td>
<td>17</td>
<td>75</td>
<td>40</td>
<td>29</td>
<td>20</td>
</tr>
<tr>
<td>3. Addictions are a barrier</td>
<td>0</td>
<td>63</td>
<td>20</td>
<td>29</td>
<td>40</td>
</tr>
</tbody>
</table>

While Canadians are aware of racism in the workplace affecting many cultures and the B.C. Human Rights Code protects people in B.C. from discrimination because of their race, a search for scholarly papers could not locate any Aboriginal specific racism in the workplace journal articles for B.C. or Canada. One article was located for racism in the education system. Writing from the first-person narrative, Lindsay (2010), of Aboriginal descent experienced racism in the education system and notes several other Aboriginal students did as well. Some students felt such discomfort that they abandoned their education.

In terms of impacts to culture from colonization, as discussed in Section 2.3.1, for some First Nations, there are gaps in knowledge of their history prior to contact and confusion about who the hereditary chiefs should be according to the tribes' customary laws. A First Nations representative described why gaps in knowledge existing for his tribe as follows.

“When we look at the conditions of aboriginal people today, we can’t point at our own people. A lot of our older people don’t want to talk about these things. There is a sense of responsibility of following through. They don’t want to be seen as not being responsible. They hold back
what they had to deal with to protect the youth. The elders refuse to talk about what they dealt with."

Another First Nations representative spoke about the loss of culture due to the way people were raised.

“If we go back to when it was against the law for FNs to participate in the economy, you wonder what is holding people back regarding economic development today. Our people seem to be slow to get off the ground and do something, they lack the confidence to try something. Fear of something new, or a learning disability, is a result of absolute laziness. There is something that stops them from moving forward. When you have multiple generations of issues. We were raised to not learn our culture because they got in trouble for it. Is it so ingrained in our people - you can't do this, you can't do that. Parents are not encouraging children to get out and do something. Not encouraging children to get a job with a pension plan, etc. Years of being told you can't do something. Perhaps that is what is stopping us.”

An LNG representative felt that First Nations could “balance their culture, not loose their identify and flourish with the changes that are coming”. Conversely, another LNG representative viewed culture as a challenge in the workplace because of the lack of familiarity. “Younger workers can be vulnerable to dealing with people who are not from their culture. This is true of any young person in the workplace. It is even more difficult when the cultures are very different from one another. For example, maybe in a particular culture, you have a certain way of dealing with people, all of a sudden you don’t have the tools to deal with issues at work”.

4.3.2 Social and Historical Barriers: Housing and Access to Healthcare

Housing

Social and historical barriers affecting access to adequate housing and healthcare have been a reality for First Nations Peoples in B.C. as a result of colonization, residential schools and other historical events as described in Section 2.2.1. Poverty and access to
affordable housing are major issues facing Aboriginal Peoples in Canada today, which are often exacerbated by the indirect effects of large industrial developments. Instead of people being able to take advantage of the positive benefits of these developments, they often end up becoming poorer, increasingly marginalized, and homeless. For those who live on-reserve, protected from rents or residential tax hikes, overcrowding is prevalent during the boom phase as those who live off-reserve lose their homes and begin couch surfing as noted by a First Nations representative interviewed.

As identified by a First Nations representative interviewed, it is very difficult to take advantage of ETE opportunities without an affordable home and/or when outstanding healthcare necessities become an issue. While many municipalities and the B.C. Provincial Government are currently working on affordable housing options, this is still a significant concern for those who rent or own and have trouble paying their property taxes. It is also well-known that access to healthcare is currently challenging for Indigenous Peoples, with additional pressure on the healthcare system, access may become even more difficult.

Many Kitsumkalum members are already living in poverty and have difficulty finding housing, which is a similar situation to other Aboriginal peoples across Canada. Of the 65 respondents for Q2, 58% reported to be living in poverty as defined by the Low-Income Measure for Canadian Households (Table 2, Section 2), and 52% were living with adults on social assistance, while 32% had no salary, including those who were disabled, retired or elderly.

Housing prices have soared recently from a mini-boom period in the Terrace/Kitimat area between 2011 and 2015, whereby an influx of 4,000 construction workers and their families caused a large increase in the cost of housing. Many low-income people, including Aboriginal Peoples, were not able to cope financially. As average rent prices increased from $494 in 2005 to $845 in 2013 (CMHC, 2016), many landowners of apartment buildings forced old tenants out due to “renovictions” as discussed in the Introduction. At the same time, the increased population in the region and the demand for jobs caused a spike in real estate prices, whereby the listed value of an average residence in northern B.C. went from $180,000 in 2007 to $265,000 in 2015.
(B.C. Northern Real Estate Board, 2016). While Kitsumkalum members currently struggle with the affordability of housing, overcrowding and maintenance of homes, with the increased cost of housing likely to occur from the next boom, their socio-economic status will decline and the disparity between Aboriginal and non-Aboriginal Peoples will be enhanced. This impact can be minimized if the band and its members are positioned well to benefit during the boom and prepare for the bust.

Figure 20 shows socio-economic data collected in Q2 by youth, males, females, and disabled/elderly categories. Economically, youth appear to be worse off than adult females or males. Youth who live with adults on social assistance make up 60%, while 80% reported a salary of less than $30,000/a, with 20% reporting no fixed income. In total, 40% of youth stated that they cannot afford accommodation.

Although household income was higher for males than females (with 53% reporting a household income of less than $30,000/a, compared with 61% of females), more males live with others on social assistance (45%, compared to 25% of females) and find housing more unaffordable (58%) than females (24%) (Figure 20). This may be a result of males
having higher expenses than females, including supporting others in the household, paying child support, and paying all the rent or mortgage while sharing with their female spouse.

Youth results showed the highest percentage of barriers (67%), including no driver’s license, shortage of work/education, lack of confidence, and issues such as alcohol addiction, depression, and anxiety preventing them from having success with ETE goals (53%) (Figure 20). Females had the least percentage of respondents with barriers (36%) or issues (24%), while 68% of males had barriers and 29% had addiction, depression or anxiety issues. It is clear, there is a need for more youth programming to address ETE barriers, and that social barriers such as addictions, depression and anxiety need to be addressed.

Of the seven people in the disabled or retired category, three reported living with adults on social assistance, one reported a household income of < $30,000, while the remainder reported no salary whatsoever (Figure 20).

The data collected from Q2 show many members find it difficult to afford housing, which is due to high unemployment, supporting others who are unemployed and on social assistance, low pay, and unresolved barriers and issues to employment. Youth appear to be the most disadvantaged, although they are the group who could benefit the most from opportunities generated by large resource development projects, if managed well.

While a public perception exists, that Aboriginal Peoples do not pay for housing, in fact most Aboriginal Peoples in B.C. (78%) do not live on-reserve and either pay for housing themselves or qualify for low-income subsidized housing (Provincial Coordination Team, 2016). Although there are specific subsidized programs for Aboriginals, the system is the same as for non-Aboriginals, complete with long wait lists and insufficient housing.

For the remaining 22% of Aboriginals in Canada who live on-reserve, First Nations band councils manage the housing stock. As described by the Kitsumkalum Band Housing Manager, although bands are provided some grant funding by AANDC to
construct a house on the federally owned reserve land, most of the funding is provided as loans by the Canadian Mortgage and Housing Corporation (CMHC), which is to be paid back by the band via monies collected from the tenants on-reserve (N. Okabe, personal communication, December 4, 2016). Although, on-reserve housing is more affordable than off-reserve (currently approximately 50% of the cost of living off-reserve in Terrace, B.C.), overcrowding can be more prevalent as noted by a First Nations representative. Through this system, some members have paid the entire amount back over time and received a Certificate of Possession, which no longer requires them to pay rent. In turn, others may receive these houses as inheritances, which also carry the same benefits.

In Q2, of the 32% who reported that they do not pay any rent, 87% were living on-reserve. For some people, shelter may be affordable because they either live with someone who pays the rent or the house they live in has been fully paid for. For the 34% who own their residence on or off-reserve, 42% have a household income of less than $30,000, which complicates the ability to pay for maintenance or repairs to the home.

Although housing is more affordable on-reserve, there are only ten serviced lots available for new houses on the Kitsumkalum reserve and no land available for a new subdivision. While 32% of people on-reserve stay with family or friends, only 4% of people off-reserve do so. These results show that the majority of Kitsumkalum members both on and off-reserve cannot afford housing, with overcrowding more prevalent on-reserve than off. If people are unable to benefit from large resource developments like LNG, it is clear that the housing situation will worsen as the cost of housing will increase with increased demand from workers and their families.

An affordable housing project proposed by Ksan House Society in Terrace is targeted at those with household incomes ranging from $36,000 to $54,000/a For the Kitsumkalum, this type of target will exclude at least 80% of youth, 61% of woman, and 53% of men, in accordance with their reported household income of $30,000/a

Housing First is an approach adopted by the Federal Government, which is based on the United Nations declaration that housing is a basic human right. People are housed
first, pay a maximum of 30% of their income, and then are subsequently provided counselling and support services. Services are individualized, flexible and community-based to address alcohol abuse, addictions, mental health issues and/or employment challenges. This method has been shown to be successful since it was introduced in the USA in the early 1980’s for improving the quality of life for homeless people and reducing pressure on the judicial system and hospitals (Housing First, 2016). In Terrace, the Kermode Friendship Society is developing and piloting a Housing First program for all Aboriginal Peoples living off-reserve (D. Hansen, personal communication, December 20, 2016).

Although healthcare (basic health care, alcohol dependence, addictions and mental illnesses) issues are incorporated into the Housing First approach, some individuals who have housing may need assistance accessing adequate healthcare. Health services such as dental, eyeglasses, addictions treatment and access to specialists are essential to obtaining and maintaining employment. Aboriginal Peoples need advocates to access the healthcare system and be provided information on how to navigate the on-reserve system through employees hired by the band or off-reserve through Aboriginal organizations like the Friendship Society.

Based on data from this study and other studies on poverty and housing for Aboriginal Peoples in B.C. and Canada, it is apparent that housing affordability and availability are key aspects that need to be considered prior to and during LNG developments, in order to better prepare for the imminent boom and influx of people to the region. With the recent occurrence of a mini-boom in Terrace/Kitimat that resulted in increased housing costs, homelessness has become a much bigger problem over the past two years. Therefore, if no effective mitigation measures are put in place to minimize housing effects to residents in the region, it is anticipated that homelessness rates will continue to increase.

**Homelessness**

In a recent study of homeless Aboriginal Peoples in Alberta, 25% of the homeless population were Aboriginal, even though Aboriginal people make up only 4% of the total...
population (Shier et al, 2015). Similarly, in the Terrace area, 74% of the homeless population were deemed to be Aboriginal, from a representative total population of 35% (TDCSS, 2016).

Homelessness in Terrace increased from 50 individuals in 2014 (Terrace Standard, 2014) to 74 in 2015 (Terrace Standard, 2015a) to 113 in 2016, with the majority (35%) in 2016 in the 30 to 40 yrs. age group, followed by 21% in the 40 to 50 yrs. age group (City of Terrace and TDCSS, 2016). Of those who reported health problems in 2016 (57%), 46% were deemed to have addictions (City of Terrace and TDCSS, 2016). Shier et al (2015) suggested that the high incidence of addictions may be why Aboriginal Peoples are overrepresented in the homeless population from their Alberta study.

The 2016 homeless study in Terrace also analyzed the origins of these people prior to coming to the city, which showed that 28% came from the Nass Valley, 27% from northwest B.C., 3% from Vancouver Island, 12% from southern B.C., 6% from other provinces (City of Terrace and TDCSS, 2016). Residents believe these results suggest that many people are migrating to the area looking for work in response to the LNG opportunities presented in the media, with an additional large influx of people anticipated when construction begins.

**Access to Healthcare**

Aside from the poorer overall health status compared to non-Aboriginals (Reading and Wien, 2009), and other health issues arising from generational effects from colonization, access to adequate healthcare for Aboriginal peoples in northern B.C. is challenging as: 1) they are often provided substandard services compared to non-Aboriginal Peoples due to medical professional stereotyping (Brown et al, 2011; Reading and Wien, 2009), 2) rural areas in Canada are at greater risk for trauma as emergency services are not as responsive as urban areas (Fleet et al, 2013), and 3) there are currently inadequate addiction services treatment in northwest B.C. (Reading and Wien, 2009).

Access to healthcare for Aboriginals has historically been and continues to be difficult, due to jurisdictional ambiguities between the provincial and federal governments,
despite the effort to tailor services to the specific needs of Aboriginal Peoples (NCCAH, 2011). While the federal government is responsible for public health and prevention services for registered status Aboriginals living on-reserve, the provision of physicians and hospital care is the provincial and territorial government’s responsibility (NCCAH, 2011). For example, while prescriptions are theoretically covered by the federal government, a status Aboriginal living on-reserve but may also be covered provincially if they are employed off-reserve or if the federal government does not cover a specific medication or service. Although a pharmacist front-line worker is required to bill the appropriate funder for the medication, both the provincial and federal governments claim to be the last to pay for the necessary coverage defaulting to the other government to pay, as described in their respective ambiguous policies (Wale and Lavoi, 2015).

Moreover, if the federal government denies coverage for a specific medication, other avenues to find coverage can be found by the attending pharmacist. If Pharmacare (B.C.) or local First Nations health organizations or the client’s First Nation’s community won’t cover the medication, the client can either pay for it directly or choose to not fill the prescription (Wale and Lavoi, 2015).

The difficulty for First Nations to access healthcare due to the inability of governments to sort out its jurisdictional responsibilities has been formally demonstrated by the need for the Jordan’s Principle. This Principle came about as a result of a very sick Aboriginal child, who was unnecessarily hospitalized for two years during his short life, because a funding dispute did not offer the financial support for the family to keep the child at home. The Principle requires all Aboriginal children on and off-reserve to receive the same medical services as non-Aboriginal children. Despite the direction given to the federal government by the courts to apply the Jordan’s Principle in all cases since it was passed in the House of Commons in 2007, INAC (Indian and Northern Affairs Canada) was brought back to court and found to be in non-compliance of the order in November 2016 (First Nations Caring Society, 2016).

The difficulty in accessing healthcare services was noted by a First Nations representative interviewed during this study, who deemed that adequate access to good health care was indeed one of the barriers confronted by First Nations communities. For
example, it was mentioned that there is no coverage for eyeglasses for those who live on-reserve, unless they receive special permission from the B.C. First Nations Health Authority. Once approved, the requestor would be responsible to pay for a portion of the cost of the glasses. However, in most cases, the glasses would have to be paid for in-full up front, and then the requestor would be partially reimbursed afterwards. As one might assume, when someone needs glasses, it would be very difficult to secure employment without them. In contrast, a B.C. citizen with a CareCard or B.C. Services Card on social assistance is covered by the Province for routine eye exams, new eyeglasses, and new lenses if there is a prescription change. The client simply informs the eye clinic and coverage is verified with the blue cross (Province of B.C. 2017a).

Like coverage for eyeglasses, the same is true for dental services, whereby local dentists demand payment up front, which may be reimbursed to the patient upon submittal of the dental request to the healthcare authorities. Overall, it appears that fine-print ambiguities in federal and provincial policies often result in no decision being made to provide adequate healthcare services for Aboriginal Peoples, thereby reducing quality of life and the potential for these people to move forward with their lives. As with eyeglasses, B.C. citizens who are on social or disability assistance have access to emergency dental services and may also qualify for basic dental coverage (Province of B.C. 2017b).

In terms of general health services rather than extended health services as discussed above, when respondents were asked about access to healthcare in Q2, 40% said that the wait time to see a specialist was unreasonably long (Likert-like scale, 0-4), with only 27% reporting the wait time to be reasonable (Likert-like scale, 6-10). The inability to see a specialist in a timely manner can result in medical issues being unattended to and becoming more serious over time. If a large influx of people come into the area during a boom period, a lack of specialist doctors can result in increased pressure on medical services and further exacerbated wait times. Combined with the current difficulty in accessing medications, dental and eyeglasses, access to healthcare for Aboriginal Peoples could become more challenging if wait times to see a doctor are extended. As discussed in the Literature review, boom and bust dynamics has the
potential to negatively impact people’s health status (Shandro et al, 2011) and for Aboriginal Peoples, this impact could be accentuated due to their specific challenges in access to healthcare.

Access to emergency services was the most important concern for youth, with 33% dissatisfied with the availability, followed by adult males at 30%. Emergency response is a vital component of health care services, as boom-bust dynamics inherently come with increased crime, prostitution, violence and addictions. To minimize increased pressure on the healthcare system from these types of negative socio-economic effects, preventative programs and increased police presence are necessary management tools.

4.3.3 Addictions are a Barrier

Of the First Nations interviewed, 63% raised the Subtheme addictions as a barrier to sustainable development in First Nations communities, while 40% of the economic development sector, 29% of mining and 20% of the LNG sectors mentioned the Subtheme. The government sector did not mention addictions during the interviews.

Addictions are known to be one of the main barriers to self-sufficiency for First Nations Peoples, which also contribute to the risk of vulnerability. During a review of nineteen studies of residential treatment programs in the U.S.A. and Canada that incorporated 17 different types of culture-based initiatives into the Western-style treatment, Rowan et al (2014) showed that there was an overall reduction or elimination of 74% of substance use post-treatment. Efforts to address addictions in northwestern B.C. need to include local detoxification facilities, along with effectiveness monitoring of treatment programs. If successful, these efforts will inevitably help to reduce vulnerabilities for First Nations Peoples.

For those who have addictions and are not treated, the situation only becomes worse during a boom period of economic activity, when personal income increases and there is more money available to purchase alcohol and drugs. Consequently, this puts additional pressure on the healthcare system, due to the increased likelihood of overdoses or associated illnesses. In addition, the large influx of workers coming to the
area would likely increase the overall percentage of people with addictions or other health problems, further straining the capacity of the system to accommodate everyone.

While access to addiction healthcare services was not specifically surveyed in Q2, addictions was reported to be an issue to gaining and maintaining employment and also noted during the interviews as a barrier. In addition, the homeless studies showed a substantial percentage of homeless people in Terrace who have addictions requiring healthcare.

Through funding that the Federal Government provides to First Nations communities for addiction treatment programs, the Kitumkalum Band has hired a part-time addictions counsellor. However, detoxification (detox) centers are not available in northwest B.C. and there are only two treatment centres, in Kitamaat Village and Kitwanga. The closest Adult Withdrawal Management Unit (AWMU, aka Detox) is in Prince George, with 14 beds serving a total regional population of 300,000 (Northern Health, 2016), one bed per 21,429 people. In comparison, there are approximately 588 detox beds (CBC, 2016) for the remaining southern portion of B.C. with a population of 4,451,600 (Statistics Canada, 2016), one bed per 7,571 people. Prince George is an eight-hour car ride or ten-hour bus ride from Prince Rupert, and a six-hour car ride or eight-hour bus from Terrace, which are long distances to travel for someone who is addicted and seeking help.

Prior to being accepted into a detox program, a doctor referral must be obtained, which is another arduous process for someone who is feeling desperate and is not highly functional. Compounding the problem is that both the detox centres and treatment centers have a waiting list of several weeks. Furthermore, an Indigenous person is required to abstain from alcohol and drugs for two weeks before being accepted into a treatment centre, whereas this period for non-Indigenous is only 3 to 10 days. The Indigenous treatment centres also accept non-Indigenous people on a case by case basis (Canada Alcohol and Drug Rehab Programs, 2016). Clearly, the level of service for addicted Aboriginal Peoples is inadequate in northern B.C. and remains a barrier to ETE for individuals.
4.4 Supports Needed

The need for supports was identified during the interviews as No. 4 of the five Themes (Table 7), and from both Q1 and Q2, it is clear supports are needed to assist people in achieving their personal ETE goals.

Table 13 shows five Subthemes associated with the Supports Needed Theme. All Subthemes are related to ETE supports except community capacity, a support needed that is more general in its required application.

Overall, LNG mentioned the Supports Needed Theme more often (60%) than the governments (50%), or First Nations (50%). Only 40% of the economic development sector felt supports were important, while 29% of mining representatives mentioned the Theme during interviews.

History has shown that Indigenous Peoples in B.C., prior to colonization, were able to buffer disturbance, self-organize, and practice resilience through social learning (Trosper, 2003). Disturbances were buffered through the potlatch system internally and externally. Internally, title holders (hereditary chiefs), who managed and controlled the land for their respective house, would be expected to host feasts and distribute wealth to other title holders. Externally, if resource abundance, such as salmon stocks, was low within a village’s territory, the chief would ask for assistance from the neighbouring village, which would be repaid in a comparable way when the other village needed it. Social learning was accomplished through the oral histories passed down from generation to generation (Trosper, 2003). These three aspects of resilience previously present within B.C. First Nations communities were interrupted by European colonization. One way to restore resilience today for First Nations communities is by providing supports for ETE success and increasing the capacity for governance and other initiatives to facilitate a members’ success towards a better future. Supports needed were identified during the interviews and data was acquired from Q2.
4.4.1 Supports for ETE

Obtaining and maintaining a job requires education, training, adequate clothing, transportation, daycare services (if necessary), and other miscellaneous items, in addition to the basic need of permanent shelter.

Table 13. Common Subthemes for Supports Needed Theme

<table>
<thead>
<tr>
<th>Supports Needed Theme. Rank = 4.</th>
<th>Federal &amp; Provincial Gov. Combined (n=6) (%)</th>
<th>First Nations (n=8) (%)</th>
<th>LNG (n=5) (%)</th>
<th>Mining (n=7) (%)</th>
<th>Ec Dev (n=5) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subthemes:</td>
<td>67</td>
<td>50</td>
<td>60</td>
<td>29</td>
<td>40</td>
</tr>
<tr>
<td>1. ETE supports are needed (travel; daycare; living allowance, etc.)</td>
<td>50</td>
<td>38</td>
<td>60</td>
<td>14</td>
<td>20</td>
</tr>
<tr>
<td>2. Social Issues arise from boom-bust dynamics</td>
<td>0</td>
<td>25</td>
<td>0</td>
<td>29</td>
<td>20</td>
</tr>
<tr>
<td>3. On vs off-reserve services are different</td>
<td>50</td>
<td>25</td>
<td>20</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4. There is a need for community capacity</td>
<td>67</td>
<td>50</td>
<td>60</td>
<td>14</td>
<td>40</td>
</tr>
<tr>
<td>5. There is a need for mentoring</td>
<td>0</td>
<td>38</td>
<td>40</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

For some people, their personal barriers and issues are preventing them from taking the necessary steps to get out of poverty. Based on the responses to the surveys and from interviews with other sectors, it appears that few Kitumkalum people are ready for LNG jobs or LNG-related contracts. The reasons for this lack of job-readiness are the overall disparity in education levels between Aboriginal and non-Aboriginal peoples, the industry’s requirement for trades people with a minimum three years of experience\textsuperscript{21}, and the requirement by LNG for businesses to be well-established and experienced. However, this doesn’t mean that many Kitumkalum members do not have the desire to have a career or a business. It is only a reflection of the apparent barriers that many respondents recognize, which impede Aboriginal Peoples from obtaining the necessary education or

\textsuperscript{21} This requirement was identified during a Tsimshian workshop with government and LNG representatives
training required to qualify for LNG-related jobs and contracts. These results are similar to other studies where Aboriginal Peoples did not qualify for jobs in the extractives industry (Gibson and Klinck, 2005; Langton and Mazel, 2008; Haley and Fisher, 2012; Dylan et al, 2013).

Conversely, other studies point to situational barriers to education and training which include: financial difficulties; poor academic preparation; moving from a small community to a large city; backgrounds of abuse and poverty; conflicting demands of studying and family; as well as racism and sexism in the school setting (Sloane-Seale et al, 2001). A 2012 survey investigated why Aboriginal students in Canada completed or left high school, noting that 14% of First Nations living off-reserve left but returned later to complete and receive their diploma (Statistics Canada, 2013). These latter positive results were also correlated with higher grades, peers and parent(s) who valued education, and feelings of confidence, security and well-being at school. The most cited reasons for not completing high school were: access to employment; desire to start earning money; lack of interest or motivation; pregnancy; caring for children or other family responsibilities; difficulty with coursework; financial hardship; and moving to a new house (Statistics Canada, 2013). Richards (2014) noted three factors important for educational outcomes: cultural differences between Aboriginals and non-Aboriginals and discrimination; quality of the education within schools; and socio-economic status of the student’s family.

While the LNG industry (60%) and the government sector (67%) recognize supports are needed for ETE to be successful, only 38% of First Nations mentioned the need for supports during the interviews, 20% of economic development, and 14% from mining. For Q2, the top three socio-economic barriers to participating in and completing ETE for both on and off-reserve Kitsumkalum members were the need for more training/education (35%), insufficient available employment (22%) and lack of a driver’s license (21%). These results were compared with 2011 statistics of Canadian Aboriginal Peoples living off-reserve, where the top three reasons for unemployment were shortage of work, work inexperience and lack of education/training, with a smaller percentage citing
barriers as lack of transportation, not knowing where to look for work and not knowing what type of job they wanted (Statistics Canada, 2011b).

Despite the relatively low percentage of First Nations identifying the need for supports, and also considering the opportunity to be “first on the bus” as discussed in Section 4.1, a First Nations representative provided their perspective on how the opportunity will likely unfold for a Tsimshian person.

“Initially, they feel wow, I’m going to have an opportunity to earn a living. I’m going to be receiving a lot of money. And it makes them feel good. Because they are being told all these things. The barriers of course, they don’t have the education to participate in any of the training. So, the issue is when LNG says Indians are going to be first in the line up, it doesn’t happen because there are so many barriers to being first in the line up. Driver’s licenses, training, affording rent when they move into town to get the training, not being able to leave their remote villages to where the training is provided. But it still makes them feel hopeful because they would like to be able to have the dollars to do what the rest of society does, enjoy life. But it doesn’t always work out that way, because they fall into social barriers. Not being able to manage their money is one.”

Currently, the LNG industry is funding trades training such as welders and pipefitters to work in the industry, and the B.C. government is providing funding for supports such as driver’s licensing, daycare, and transportation to assist northwest B.C. First Nations in obtaining LNG related training. These two sectors, because they are putting resources into supports, likely feel these supports are needed while other sectors may feel the existing resources are adequate, and other factors are more important. In order for these supports to result in positive outcomes will depend on whether there are LNG related employment opportunities available post education and training.

For Kitsumkalum members, specific support initiatives and programs can be tailored from socio-economic data collected during this study to address individual goals and aspirations for long-term careers provided there are sufficient resources to allocate
to such programs. In addition, a recruitment database could be created to facilitate job-matching and track individual needs, in terms of necessities for travel related to work, daycare, living allowances, work clothes, mentoring, career and financial counselling. Although there are currently various kinds of assistance offered both on and off-reserve, mentoring and career counselling are normally not part of these services, which can jeopardize career development success. For example, as identified by an economic development representative, when a heavy equipment operator course was offered in the region, members who obtained funding and completed the course were told post training that the course was not union-approved and therefore they were not eligible for union jobs, or they did not qualify due to insufficient seat time\textsuperscript{22}.

Individuals and communities have varying degrees of resilience and vulnerabilities that are dependent on several factors. Increasing individual and community resilience through cultural teachings and increased community connections, as well as improving educational/training outcomes, will inevitably decrease vulnerabilities, leading to higher self esteem, self-worth and financial independence. Gibson (2008) discusses the restored self-esteem of Dene men working for the Diamond Mines in Canada’s Northwest Territories which was correlated with reduced family violence.

One way to address self-esteem issues is to increase resilience by revitalizing culture, language, and connection to the environment, as discussed by Kirmayer et al, (2011). Resilience is defined as having the ability to cope effectively, especially when facing adversity. Story-telling and sharing historical identities can contribute to resilience through emotional regulation, problem solving, guidance and healing (Kirmayer et al, 2011). Aboriginal mentors could support students and new workers in this way which would contribute to an individual’s success in ETE.

4.4.2 Social Issues arising out of Boom-Bust Dynamics

During the boom period, increased violence, exacerbated drug and alcohol addictions (Cameron et al, 2014) and crime rates are expected to occur, along with the potential for prostitution of young girls. During the last mini-boom (2012-2014) in the

\textsuperscript{22} Seat hours refers to how many hours of experience one has operating a piece of heavy equipment
Terrace area, a First Nations representative noted that Indigenous girls as young as 13 yrs. old were found in local hotels with temporary construction workers. The Australian Government recently published a guidance note for the extractives industry recognizing that one of the risks children face is sexual abuse and exploitation by in-migration of workers (Australian Government, 2017). It is clear that these types of impacts need to be mitigated through a collaborative approach between industry, government, First Nations and other relevant organizations, with monitoring and additional policing, if required. Although it is impossible to completely eliminate these kinds of negative impacts, increased attention must be given in order to minimize the extent of this illegal activity, through mechanisms such as reporting and action taken by authorities.

In comparison, the impacts of the bust period include potential massive layoffs, the out-migration of workers and their families and increases in the incidence of depression and other illnesses (Shandro et al, 2011). Although planning for employment beyond the construction phase will help mitigate these effects for both Aboriginals and non-Aboriginals, career and other counselling services are needed to address depression, substance abuse and related illnesses.

For those companies who have already received their environmental assessment approvals, social management plans still need to be further developed in terms of mitigation, management and monitoring of socio-economic effects resulting from the project. They also do not address cumulative effects, which are likely to occur if other developments proceed at the same time. Unfortunately, due to the uncertainties of whether the projects will go ahead and when, management planning and collaborative measures are usually not fully mapped out. Therefore, once an investment decision is made and the proponent moves quickly towards construction, often the detailed planning regarding mitigation, monitoring and management of potential environmental and socio-economic impacts needs to be quickly schematized, resulting in little meaningful input of Aboriginal Peoples and other interested parties.

If and when socio-economic cumulative effects are assessed and monitored, transparency and collaboration among varying interest groups (industry, government and First Nations) are important to ensure data is collected and reported without bias.
Unfortunately, in some cases, the existence of apparent socio-economic effects is not deemed the responsibility of a company approved for operating within the area. At a Northwest Territories Diamond Mine, causes of crowding in houses was identified through monitoring, however this was not attributed to impacts from the mine, even though company personnel had acknowledged that this was indeed an issue. Instead, the impact was attributed to unemployment, where an unfounded causal relationship between violence and unemployment was documented (Bell, 2013). Without transparency and collaboration, it is very difficult to manage for socio-economic impacts affecting Aboriginal People’s ability to benefit from large resource developments.

4.4.3 On vs off-reserve services

Results from this study and other similar studies show that each individual within a community has specific challenges and opportunities that will need to be managed during boom-bust periods. However, on-reserve needs can differ from off-reserve needs.

The Ministry of Aboriginal Relations and Reconciliation (MARR) and Friendship Centers in B.C. are implementing the Off-Reserve Aboriginal Action Plan (B.C. ORAAP, 2015) to achieve better education, job training, healthier family life and help strengthen culture and traditions. Several key themes and guiding principles will be used to guide this initiative that will be overseen by MARR, Ministry of Child and Family Development, Ministry of Social Development and Innovation, B.C. Association of Aboriginal Friendship Centres, Metis Nation British Columbia, Union of B.C. Municipalities, and Aboriginal and Northern Development Canada (Provincial Coordination Team, 2016). As these friendship centres already know many off-reserve members within their respective communities through other programs previously offered, they are well-suited to help off-reserve Aboriginal Peoples move forward with their lives. However, some services not offered by ORAAP continue to be administered by the band on-reserve such as funding for post-secondary. If there is little to no connection between off-reserve and on-reserve band members, there may be barriers to accessing specific services or supports offered.

A major challenge for many B.C. First Nations is how to re-establish the cultural and family ties between on and off-reserve members. Relocating to reserves is not a practical solution as many reserves do not have the space or housing available and some
reserves are remote with little opportunity for employment. INAC is the key federal department working and funding Indigenous Peoples programs in Canada, however the Provincial Government funds programs and services for off-reserve Indigenous Peoples in B.C. as noted above. Therefore, there is little connection between on and off-reserve Peoples who belong to the same ancestral group and an improved system of funding is needed to reunite people with their original clans, houses, and tribes. Many believe and some studies show, self esteem and self worth can be elevated through reconnecting with culture and identity, increasing resilience and reducing vulnerabilities and facilitating healing from the effects of colonialism and residential schools (Kirmayer et al, 2011). A government representative noted that “communities are struggling with their on and off-reserve members and how to serve them both”.

The government appears to recognize problems associated with on vs. off-reserve services as an issue (50%), with First Nations (25%) and LNG (20%) mentioning the Theme to a lesser extent. One government representative noted that communities are struggling with trying to service their off-reserve members partly because their needs are different, while a First Nations representative believes the same services should be accessible for all members regardless of where he or she lives.

4.4.4 Community Capacity

The need for increased resources to increase community capacity was mentioned in several interviews with respect to various issues such as having adequate capacity to engage on projects, skills training, financial and negotiation training, capacity to plan for the future, increase governance capacity, and capacity to work in and service industry through contracting. The government sector mentioned capacity building most often (67%), followed by the LNG sector (60%). First Nations and economic development sector Subthemes were mentioned by 50% and 40% of those interviewed respectively, with only 14% of the mining sector interviewees mentioning the Subtheme.

4.4.5 Mentoring

In a study of Aboriginals from Manitoba taking post-secondary education away from home, a lack of self-esteem, child care and other social services, combined with racism and sexism were cited as barriers to success by the individuals who were
interviewed (Sloane-Seale et al., 2001). In that situation, people felt alienated, experienced culture shock and found it hard to leave behind family and friends. Although a lack of role models within their home community was noted by participants of the study, support from family and school counselors made a difference in being successful in their studies.

The Kitsumkalum membership also recognized the importance of supports in the form of mentorship; 86% of parents who responded to Q1 (Likert-like scale, 6 to 10) felt that tutoring is important to children’s success in Kindergarten to Grade 12, while those who responded to Q2, 45% of adults on-reserve and 50% off-reserve stated that they would take more education if mentoring were available to help them (Likert-like scale 6 to 10). Conversely, it was surprising to find that only LNG (48%) and First Nations (38%) representatives mentioned the importance of this activity during the interviews.

Unless formally included in career counselling services, mentoring is often only a volunteer activity practiced by church leaders or school liaisons. However, if properly administered, Aboriginal mentors could be utilized as a support mechanism to help others move forward with their lives. In addition, there is an urgent need for trained career counsellors to assist Aboriginal members with their individual career paths. Until a formal system of mentorship is established, recruiting informal mentors within the community to assist others in completing their training, education or a new employment position will likely result in improved outcomes for individuals.

In order to ensure a greater chance of success, an integrated multifaceted approach could address social issues such as anxiety, alcohol addiction and depression, prior to initiating or in association with ETE programs. Studies have shown increased success when using a holistic approach incorporating mentorship and other support initiatives for people who have mental health issues (Schindler and Sauerwald, 2013).

A First Nations representative interviewed noted the need to empower individuals to look after themselves. This can be achieved by characterizing the population and tailoring programs to meet individual needs, such as addressing common socio-economic barriers and assisting people to receive the necessary education and training to qualify
for long-term employment. In addition, life skills to help manage money, family commitments, and work issues such as how to deal with racism in the workplace may also need to be taught to encourage self-sufficiency. When specific issues are addressed, individuals then hopefully have the tools to be able to move forward with their lives (First Nations representative), increase their resiliency and reduce vulnerabilities.

4.5 Environmental

The environmental theme was ranked No. 5 of the five themes as shown in Table 7. The lack of mention during this study of environmental issues for sustainable development, as discussed within this subsection, is likely not a reflection of its importance overall, but a result of the structure of the study, and the overall subject matter. Questions asked during the study were tailored to the socio-economic aspects of sustainable development and were not specific to environmental management topics. Additionally, environmental issues are addressed as discussed in Section 1.3, in much more detail than the socio-economic issues during both the Canadian and B.C. Environmental Assessment process.

There are potential negative environmental impacts associated with specific LNG developments, which are amplified when combined cumulatively with other LNG and any other industrial projects and in the context of background conditions as discussed in Section 2.1.5. For the projects currently proposed for implementation in the Prince Rupert and Kitimat areas, potential environmental impacts could harm coastal ecosystems, where the Tsimshian and Haisla Peoples have lived and harvested traditional foods for several thousand years. Continued access to these resources for Indigenous people is important from many perspectives, including: 1) benefits for health, as many marine foods are rich in omega-3 fatty acids, vitamins and minerals; 2) socially, due to communities coming together to harvest in groups; 3) culturally and spiritually, based on age-old practices of collecting, fishing and hunting and passing on the knowledge to the youth; and 4) economically, as it reduces the need to buy more processed foods from the grocery stores. Furthermore, it is important to recognize that the harvesting of traditional foods can provide a type of healing for some and be part of a holistic program to build self-esteem and help people move forward with their lives.
As discussed in Section 2.1.3, the Skeena estuary is unique, as it is comprised of mudflats and intertidal areas, which provide key habitat for several rare aquatic species and is shared with the Nass River estuary (Ocean Ecology, 2014). Determining the right site for a LNG terminal is very important, considering that coastal waters provide food, contribute to the natural biodiversity and ecosystem health of the area, and are highly valued within the culture, traditions and spirituality of Indigenous cultures. Furthermore, some coastal areas are highly productive, with kelp and eelgrass habitats being important for many marine species and migrating fish.

Common environmental concerns about LNG developments, which have already been voiced by the Tsimshian peoples, include: impacts to air quality and greenhouse gases; impacts to freshwater ecosystems, including detriment to salmon habitat and migration through the Skeena estuary; access limitations to traditional use of marine areas; reduced food security and quality; increased marine navigation issues; potential for contamination of marine foods; and reduced access to hunting and trapping areas (R. Gemeinhardt, personal communication, March 21, 2017). Other concerns include noise impacts caused by more ships operating in the region, which also increases the potential for accidents and spills, preservation of archaeological values, protection of culturally modified trees, and concerns about the potential for wildlife to avoid key habitat as a result of the project (PNW, 2014). Although some of these impacts are small-scale and can be mitigated accordingly, especially with the implementation of adequate safeguards, others remain a concern either alone or when combined with the cumulative effects of other projects.

Table 14 shows only one Subtheme, Conflicting Values, raised by those interviewed. Conflicting values, as described by those interviewed, refers to Aboriginal Peoples who feel they must chose between protecting the environment and their cultural practices on the land, and working for industry. Despite the historical and current participation of Kitsumkalum members in industry (logging, fishing, etc. as described in Section 3.1), results from Q2 showed Kitsumkalum members continue to access traditional foods and use areas significantly. For this reason, environmental effects from
LNG developments are important to the discussion on sustainable development in First Nations communities.

Table 14. Common Subthemes for Environmental Theme

<table>
<thead>
<tr>
<th>Subtheme</th>
<th>Federal &amp; Provincial Gov. Combined (n=6) (%)</th>
<th>First Nations (n=8) (%)</th>
<th>LNG (n=5) (%)</th>
<th>Mining (n=7) (%)</th>
<th>Ec Dev (n=5) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Theme. Rank = 5.</td>
<td>0</td>
<td>13</td>
<td>60</td>
<td>29</td>
<td>0</td>
</tr>
<tr>
<td>Conflicting Values</td>
<td>0</td>
<td>13</td>
<td>60</td>
<td>29</td>
<td>0</td>
</tr>
</tbody>
</table>

While LNG representatives mentioned the different value system Aboriginal Peoples have when compared to non-Aboriginal Peoples with respect to preservation of the environment and the traditional use of the land, the mining industry described the conflicting values in terms of working with individuals who may need the hunting season scheduled off or require time to attend family functions. With the large number of IBAs signed in the Province of B.C. between proponents and First Nations and the Province and First Nations for forestry, mining, and oil and gas, in general it can be assumed that environmental impacts to traditional use areas are considered when signing many of these agreements. Furthermore, many First Nations understand how important resource development benefits emanating from these agreements are for their youth and future generations for an improved standard of living and future. The challenge is conserving the ability to continue with traditional use within each First Nations respective territory, while benefiting from resource developments through appropriate mitigation for both benefits and impacts. Conflicting values, because rights and title are held communally, could be defined as the polarization of support that can occur within a community as a result of some people valuing the preservation of the environment more than the potential benefits from a development as revenues, employment and contract work.

4.5.1 Conflicting Values

The Conflicting Values Subtheme was raised by 60% of LNG representatives during the interviews, with only 29% of mining, and 13% of First Nations mentioning the
Subtheme. While environmental issues were considered in the context of traditional foods and harvest areas, interview and survey questions did not include direct environmental related questions, with the exception of harvesting questions in Q2. The heightened concerns of environmental issues related to LNG development by the LNG sector compared with other interviewed sectors may be a result of the recent extensive media coverage of the PNW LNG project and the relatively small number of First Nations groups who oppose the Project. These concerns could be viewed as conflicting values, or alternatively, from an Aboriginal groups viewpoint, risks versus benefits analyses, where the risks for them outweigh the benefits in terms of food security, physical access to traditional foods and use areas, the potential reduction of traditional foods, marine vessel traffic and increased risk of accidents, the potential for overexploitation of resources, and the challenge in maintaining social, cultural and ceremonial activities.

It is important to point out that none of the elected chiefs, mayors and councillors of the six Tsimshian Nations have voiced public opposition to the PNW LNG Project. This may be due to the intensive project review they have conducted with funding provided by the proponent. However, the Lax Kw’alaams Nation have waivered on their support. In May 2015, 180 of the 3,826 Lax Kw’alaams members (AANDC, 2016c) voted against the $1.14 billion benefit offer from PNW over the 40-year life of the project (CBC, 2015b). In March 2016, after a leadership election, Mayor Helin of the Lax Kw’alaams sent a letter to the federal government pledging support for the project, as long as their recommended legally-binding conditions formed part of the EA Decision Statement (Helin, 2016). In August 2016, 532 out of 812 Lax Kw’alaams members voted in favour of continuing discussions about the project with PNW LNG (Northern View, 2016a). The change in support by the Lax Kw’alaams Band members may have been due to a larger voter turnout and/or more dissemination of information regarding the potential benefits and impacts of LNG developments in the region.

In contrast, Hereditary Chief Wesley of the Gitwilgyoots Tribe, one of the Nine Allied Tribes of the Lax Kw’alaams Nation, has claimed title to Lelu Island, which resulted in occupation of the island in August 2015. In addition, Chief Wesley and the Gitwilgyoots Tribe have voiced opposition to the Lax Kw’alaams’ letter to PNW pledging support
(CFTKTV, 2016). However, several Lax Kw’alaams hereditary leaders signed a document in May 2016 withdrawing their support for Chief Donald Wesley’s occupation of Lelu Island and challenging his claim as Chief of the Gitwilgyoots Tribe. In rebuttal, Chief Wesley’s lawyers contacted the Northern View newspaper and dismissed the validity of the challenge (Northern View, 2016b).

It is important to mention that the federal and provincial governments recognize the leadership of aboriginal group leaders relative to the support provided by the respective memberships. For example, the Gitxsan govern themselves based on the traditional Hereditary Chief system, where more than 50 hereditary chiefs represent houses (Wilps) of the Nation, which are recognized by the federal and provincial governments. Another example is the Gitanyow Hereditary Chiefs, who are recognized by the governments and their membership to manage the land, water and resources for the Gitanyow Nation. In comparison, the federal and provincial governments do not currently recognize the Gitwilgyoots Tribe as the communal rights holder for the Lax Kw’alaams people, as it is the Lax Kw’alaams Band who legally have the right to speak for the Nine Allied Tribes. The Lax Kw’alaams Band have not shown support of this particular Tribe formally to represent their communally held rights and title.

**Food Security**

LNG developments may cause a potential reduction in access to traditional use areas and reduce the ability for members to continue to access the resources which, in turn, would impact their food security. This would not only reduce their ability to access traditional foods and practice their culture, but would also incur higher costs for feeding themselves and their families, which becomes especially challenging for low-income members. Reduction in access may occur as project sites are developed or as money becomes scarcer as the cost of living increases. A reduction in disposable income would compromise the financial means for Kitsumkalum members to fish or hunt. Increased pressure on fish and wildlife stocks, due to more people coming to the region to work in the resource development sector, could also end up reducing the access and availability of these traditional foods.
Physical Access

Implementation of past resource development projects and the construction of transportation networks have already reduced access to many areas along the B.C. North Coast for Tsimshian Nation peoples as described in Section 3.1. As each new proposed development moves closer towards implementation, the Kitsumkalum and other B.C. First Nations in the region (Chan et al, 2011) are becoming increasingly concerned about temporary and permanent loss of access to traditional use areas.

An example of temporary loss of physical access to traditional use areas is likely to occur during the construction phase of the proposed PNW LNG project. The Porpoise Harbour Marina Complex in Port Edward, B.C. has moorage for 350 vessels with power, potable water, storage, forklift service, washrooms/showers/laundry and off-site parking (Port Edward Port Authority, 2017). Currently, many Kitsumkalum members tie up their boats at this harbour. The 15-month construction phase is likely to hinder the ability for boats to leave the harbour while the material offloading facility (MOF) is being used (Figure 21). Although there is an alternative launch option for small boats in the Prince Rupert area, according to the Kitsumkalum Band Manager, this would increase travel time by an additional 10 nautical miles to access traditional harvesting locations (S. Roberts, personal communication, March 27, 2017). For larger boats moored at Porpoise Harbour, relocating to moore at another location may not be practical, requiring another solution to be found. Currently, there is insufficient information provided by the proponent to understand how often the MOF is slated to be utilized during construction and how access to traditional use areas will be potentially impacted. Additionally, the Prince Rupert Port Authority\textsuperscript{23} regulations and creation of possible “no access zones” has not been clarified with the affected First Nations (R. Gemeinhardt, personal communication, March 21, 2017).

In addition to potential temporary reduction of access to traditional use areas, there is also the risk of permanent loss of access over the 25-40 year-life of some of the

\textsuperscript{23} The Prince Rupert Port Authority has legal jurisdiction over the lands to be occupied by the LNG developments.
proposed projects. These effects will be exacerbated if all of the 13 proposed projects in the Prince Rupert area and three in the Kitimat area move ahead to construction.

It is important to remember that each facility is different and the potential total loss of access if one or all projects were to proceed is difficult to estimate. For example, the proposed and not yet approved Aurora LNG will require 773 ha of land and 12 ha of marine habitat (Aurora LNG, 2017), while PNW LNG will need 160 ha of land and less than 100 ha of marine habitat (PNW LNG, 2014b). In comparison, LNG Canada in Kitimat requires 430 ha of land and will utilize an existing jetty for its terminal (LNG Canada, 2014). Other smaller projects are either under construction or in the planning stages, such as the propane export facility AltaGas, which began construction this year (Figure 21). The loss of access could be classified as temporary, because at closure these sites would be reclaimed and the original land and water use restored. Similarly, impacts to displaced boaters who might experience difficulty navigating, due to large LNG tankers, could also be considered temporary. However, the cumulative effects may have a serious impact over the long-term, which could be difficult to restore as the loss of access could impact a generation or more resulting in the potential loss of traditional knowledge being passed down to the younger generation.

**Potential Reduction in Traditional Foods**

The potential reduction and degradation in the quality of foods impacted by LNG development is a concern for many First Nations peoples, as the area has already been affected historically by the presence of industry in both Prince Rupert and Kitimat, principally due to untreated effluents being discharged into both marine and freshwater environments. A First Nations individual interviewed explained how the elders talked about a time when Porpoise Harbour was a popular harvesting location for many kinds of marine species, until the pulp mill at Watson Island (Figure 21) began to discharge its effluent into the harbour in 1955.

Eulachon is another example of an endemic fish species that has been severely impacted by contact with contaminated effluent discharged from the Eurocan Pulp Mill,
starting in 1969 through to 2009\textsuperscript{24}. This was a very important food source for the Haisla Nation from the Kitimat River, which saw its populations and the quality of the fish plummet, due to rampant aquatic pollution. The fish absorbed waterborne contaminants, rendering them unpalatable, as well as drastically reducing the size of the spawning migratory runs up the Kitimat River.

The abundance and quality of foods in terrestrial, freshwater and marine environments can also be directly affected temporarily and/or permanently by LNG developments, including: emissions to the airshed, which can influence global warming from increased greenhouse gas emissions; and dredging, due to construction of facility infrastructure, resulting in resuspension of sediment in the water column, affecting both species and habitats.

Although individual large-scale LNG developments are not predicted to exceed CCME Management Level Thresholds for NO\textsubscript{x} or SO\textsubscript{2}, projected cumulative effects from the operational phase of several LNG developments, as modelled in both Prince Rupert (MOE, 2016) and Kitimat (ESSA, 2014) do exceed critical loading levels, which could cause nearby lakes and some land areas to become more acidic and eutrophic (see Section 2).

When a multitude of large-scale extraction projects reach the operational phase in Prince Rupert and Kitimat, projected eutrophication and acidification effects to terrestrial ecosystems are expected to impact the abundance of some sensitive lichen species (MOE, 2016). However, long-term impacts on species composition and diversity within an ecosystem are difficult to predict, as changes can be slow or a sudden shift can occur (Scheffer et al, 2001). Restoration of an ecosystem, once it has undergone transformation, may require significant effort and can be expensive to return it to its desired state (Scheffer et al, 2001).

\textsuperscript{24} This site continues to leach contaminates into the Kitimat River. Kitimat LNG has acquired the site and plans to remediate prior to construction; however, no investment decision has been made as of the writing of this dissertation.
Figure 21. Location of eelgrass habitats and B.C.MCA ECO conservation areas. Project areas in relation to boat launch and moorage points and the material offloading facility of PNW LNG in the Prince Rupert area (PNW LNG; AltaGas; and Aurora LNG).

Moreover, air quality impacts altering ecosystems and the availability of traditional foods, can be exacerbated by global warming effects. Although GHGs emissions were quantified for each proposed LNG development in the Prince Rupert and Kitimat regions,
they were not modelled for cumulative effects in either of the air shed studies. Researchers are only beginning to understand the combined effects of GHG and eutrophication and acidification of marine ecosystems. A laboratory study by Burnell et al. (2013) has shown that although nutrient enrichment decreased grazing, overall grazing increased due to higher temperatures and acidification. Sea urchin grazing effects can significantly alter ecosystems, as demonstrated by studies related to the loss of sea otters in the north-east Pacific Ocean, where overgrazing of kelp forests by sea urchins occurred. This study by Steneck et al. (2002) showed that the kelp forests only returned when otters were reintroduced to feed on the urchins. The natural environment is much more complex than the laboratory, making it very difficult to predict what will happen at the ecosystem level as species are lost.

In Kitimat, the permitted concentrations of SO2 currently exceed critical loading thresholds for terrestrial and aquatic ecosystems in some locations (Section 2) and any additional SO2 will further degrade ecosystems, albeit by small increments. With the installation of a scrubber at the RTA aluminum smelter in Kitimat, SO2 emissions could be reduced significantly. However, solid waste generated from treating the SO2 as an alternative to emitting it to the atmosphere would still need to be managed.

Although air quality impacts to marine ecosystems, including the Skeena estuary, have not been studied specifically for the Prince Rupert or Kitimat areas, it is important to note that ocean productivity is limited by nitrogen inputs and can be more sensitive to eutrophication than freshwater aquatic ecosystems (Krzyzanowski, 2010). Therefore, increases in nitrogen levels could theoretically increase the number of algal “red tide” blooms (Krzyzanowski, 2010) found in shallow off-shore areas. While mosses, lichens and vascular plants are known in general to benefit from the increased availability of nitrogen, damage or mortality can occur at very high concentrations (Cunha et al, 2002) and some species will outcompete others (Krzyzanowski, 2010). It has also been shown that nutrient inputs from anthropogenic sources have resulted in reduction in Eelgrass (Zostera marina) biomass in different parts of the world (Short and Wyllie-Echeverria, 1996). Although marine benthic invertebrates are also sensitive to high concentrations of
nitrite (CCME, 2003), these potential impacts have not been investigated in the studies of either Prince Rupert or Kitimat.

Cumulative nitrogen inputs to estuaries can come from air shed emissions as well as forest runoff, agricultural runoff, urban runoff and sewage (Hameedi et al, 2007). If several LNG facilities are constructed and put into operation at the same time, nitrogen inputs to the Skeena River estuary will continue from forest, agricultural and urban runoff, will increase from LNG-related emissions, and will increase from the associated construction camp sewage discharge. The sewage system in Prince Rupert is approximately 80 yrs. old and involves only primary treatment, being discharged from ten separate locations into Prince Rupert Harbour (City of Prince Rupert, 2013). In comparison, the neighboring community of Port Edward, which reported a population of 544 in 2011, has a sewage system capable of supporting up to 1500 people with secondary treatment, including screening, oxidation, digesters and clarification, before being discharged into Porpoise Harbour (City of Prince Rupert, 2013). However, even if only one of the proposed LNG projects gets approval for construction, Port Edward will need to expand its sewage treatment plan to accommodate several thousand workers, as this area is planned for a large construction camp serving different LNG projects and other proponents (PNW LNG (2014b).

In order to develop appropriate mitigate measures, the cumulative air quality effects as each additional industrial project is proposed, it is necessary to quantify and characterize the potential impacts to all marine vegetation (e.g. seaweed, seagrasses) and benthic invertebrates (e.g. crabs, clams, sea urchins), that are of interest to First Nations as traditional foods. Furthermore, to reduce overall atmospheric emissions, it is also important to consider design changes to the energy systems, such as using electric drive power rather than gas power for all or some of the future LNG developments.

As discussed in Section 2.1.3, dredging of the sea floor during construction of the off-shore installations causes sediments to be temporarily suspended in the water column, which can affect marine life. Moreover, if the sediments are contaminated due to previous industrial activity, as is the case in the vicinity of the PNW LNG project in Prince Rupert and the LNG Canada project in Kitimat, there is the potential for contaminants to
become bioavailable during dredging, which can cause acute and chronic impacts to marine life in the vicinity. Considering that dredged sediments are usually deposited in deeper waters at sea\textsuperscript{25}, adequate verification of their contaminant potential is conducted beforehand, in order to avoid dispersal of the contaminants to neighbouring habitats. Therefore, it is essential that possible degradation of plants and other aquatic organisms be carefully managed and monitored during and post-dredging at the dredging site to determine if contaminants have been taken up by aquatic organisms and are further consumed by humans or by others in the food chain.

Apart from affecting water quality, dredging also disrupts the substrate in the affected areas and modifies water flow patterns, which can reduce the survivability of certain plant species such as eelgrass. Factors affecting eelgrass abundance include turbidity, salinity, current velocity, wave exposure, sedimentation, cumulative sewage impact, average substrate particle size and bottom slope (Ocean Ecology, 2013). The PNW LNG project estimates the need to excavate 200,000 cu m of marine sediment once to facilitate the use of the Material Offloading Facility (PNW LNG, 2014b), while LNG Canada will dredge between 2.5 and 3.5 million cu m of material initially during construction with dredging at the marine terminal every 10 yrs (LNG Canada, 2014).

The Federal Environmental Assessment (CEAA) process has resulted in two types of studies assessing the potential for changes in sediment movement around Flora Bank, which could impact the eelgrass beds (see Section 2.1.3). However, the conflicting results of these studies has resulted in uncertainty regarding the extent to which these beds will be affected by the project infrastructure. This uncertainty has led to some regional opposition to the PNW LNG project, as migrating salmon rely on these eelgrass beds.

Other temporary impacts on marine life will be caused by blasting and pile-driving to construct the coastal terminal, due to the noise disturbances and general site disruption, which could potentially affect the migration patterns and reproductive cycles of different aquatic organisms. However, PNW LNG has stated that it is committed to implement mitigation measures if necessary in order to protect aquatic life. For example,\textsuperscript{25} The preferred option of disposing of dredged material is at a disposal site at sea as it is the most economic viable option.
if marine mammals are spotted within a 1 km radius during blasting and piling, all work activity will be stopped until all animals have left the area (Pacific Northwest, 2016).

Any impacts to eelgrass (Figure 21) and kelp abundance (Figure 22) along the B.C. North Coast can indirectly affect several other marine species and anadromous fish like salmon and eulachon, which rely on eelgrass and kelp during various life stages. Moreover, other species associated with kelp, like the green algae *Ulva* spps. and the red algae, *Porphyra* spps (nori), which are harvested by Kitsumkalum members, are likely sensitive to impacts such as acidification and eutrophication. Although it is known that kelp has high resilience and is able to re-colonize quickly after disturbances, increased turbidity and/or increased predation can affect its long-term viability (Steneck et al, 2002).

As predicted by other LNG projects, it is also predicted that the proposed Aurora LNG project will end up directly destroying populations of eelgrass, kelp and other marine life, due to dredging operations for a Materials Offloading Facility (MOF), pioneer facility and two berthing stations in Casey Cove and the southern tip of Digby Island (Aurora LNG, 2017). Specifically, it has been estimated that the proposed installations will cause the loss of up to 78,675 m² of marine substrate, 6,180 m² of eelgrass and 3,537 m² of marine riparian vegetation. In compensation, the company is planning to reconstruct up to 70,780 m² of marine habitat at Casey Cove, including 6,180 m² of eelgrass biotope (Aurora LNG, 2016).

**Marine Vessel Traffic and Increased Risk of Accidents**

Projected significant increases in marine vessel traffic during the construction and operation phases of proposed LNG projects has prompted urgent discussion by the Kitsumkalum regarding potential safety concerns as noted by the Kitsumkalum Referrals Coordinator, R. Gemeinhardt (R. Gemeinhardt, personal communication, March 21, 2017). Other than the USA, which requires state-legislated safety and security zones for their hydrocarbon terminals and shipping activity within harbours, Western Europe, Britain and Australia utilize traffic control and separation systems with local safety zones and operation rules, based on risk analyses specific to a particular harbour (Transport Canada, 2005). Similarly, the Prince Rupert Port Authority oversees all operations within
the Port of Prince Rupert in coordination with the Canadian Coast Guard’s Marine Communications and Traffic Services, Pacific Pilotage Authority, B.C. Coast Pilots, SMIT Marine\textsuperscript{26}, Western Canada Marine Response Corporation and the Canada Border Services Agency (Port of Prince Rupert, 2017). As the Port grows, additional measures will be implemented to manage the growth (Port of Prince Rupert, 2017).

A cumulative impacts study of marine vessel traffic in the Salish Sea, including spills and potential accidents and shoreline impacts related to six existing and proposed projects, was conducted utilizing 50 biological receptors, which were chosen for their economic or spiritual/cultural value (Gaydos et al, 2015). Possible species interactions under various scenarios were considered through a review of published data and it was found that 23 to 28\% of these impacts are likely to occur, with a further 15 to 28\% being possible. It was recognized that management of these potential impacts needs to be conducted in a collaborative manner, including First Nations, different stakeholders, organizations and multi-national agencies (Canadian and American agencies) to effectively minimize potential effects from these developments (Gaydos et al, 2015). As with all socio-economic and environmental effects of large-scale resource developments, the collaborative approach is key to successful management.

\textbf{Overexploitation of Resources}

Over the last ten years, 39\% and 59\% of Kitsumkalum members reported in Survey Q2 they have noticed an increase in other First Nations and non-First Nations respectively occupying their fishing grounds. With a large influx of people coming from outside the region to work on even only one large LNG development, the increased pressure on fishing and hunting will inevitably be considerable. Although the Federal and Provincial Governments can restrict fishing and hunting through closed areas and implementing additional catch limits, enforcement of these measures is very difficult to manage on a long-term basis.

Situation in the past have shown that financial compensation cannot replace lost access to traditional use areas, as demonstrated by the results of a study conducted by

\textsuperscript{26} A harbor towing and salvage company based in Prince Rupert
Angell and Parkins (2011), which investigated resource development projects in Canada from the 1970s to 2010. These authors found that when communities either lost access to certain areas of land or were relocated due to flooding for hydroelectric dams, the financial payouts and/or royalties only ended up causing or exacerbating social problems such as suicides, drug addiction and alcoholism. However, the same study also found that those who are employed by resource developments have more disposable income to purchase gear and equipment, which can help to increase their level of traditional harvesting.

Loss of access to traditional use areas can result from an increased cost of living, which results in less financial means needed to access these areas and practice harvesting. People who are on low fixed incomes and not in subsidized housing will suffer disproportionately, having less money to pay for a boat or truck, maintenance, insurance and other related expenses. Consequently, this limits their ability to harvest traditional foods personally, which not only help to offset ever-rising grocery costs, but are also a good source of nutrition. Additionally, this loss of access to the land can also be devastating in a spiritual and cultural context for Aboriginal Peoples, especially for those who are still trying to heal from the effects of colonization, such as the damage caused by the residential schools.

*Maintaining Social, Cultural and Ceremonial Activities*

Maintenance of social, cultural and ceremonial activities on the land and the water is essential because it not only provides important sustenance to families, but also facilitates the preservation of the unique culture of each Nation. As mentioned previously, the key aspects associated with benefits and impacts from LNG developments must be assessed not only independently, but also in relation to other factors. For example, employment, income and housing conditions will affect whether a person has the time and wherewithal to fish, hunt or pick berries. In other words, these factors influence whether someone has the capacity to exercise traditional harvesting rights, which, in turn, can impact the ability to obtain enough food and maintain indigenous customs.
Figure 22. Kelp distribution in the PNW and Aurora LNG proposed project areas
Results of the Q2 survey showed the relationship and connection of all respondents to ocean foods was 75% (6 to 10 on the Likert-like Scale), with 66% expressing that they are strongly connected\textsuperscript{27} (8 to 10 on the Likert-like scale). Similar to these results, another study found that most First Nations members within a community still consume traditional foods (Chan et al, 2011). Most Kitsumkalum respondents stated they prefer to regularly consume salmon, herring eggs, crabs, seaweed, halibut, and cod.

Although there is limited data for each age group from Q2 and results are not statistically significant using the Likert-like scale data, the results of the 41 to 50 yrs. age group showed the least direct access to traditional ocean foods, while people 31 to 40 yrs. had the least access to foods provided by other Kitsumkalum members. In comparison, the younger age groups, 18 to 25 and 26 to 30 yrs., receive most of their traditional foods from others rather than getting it themselves, which is different from the over 50 age groups, where most respondents strongly agree they have direct access (average >8.2 on the Likert-like scale).

The 41 to 50 yrs. age group appear to have less direct access to ocean foods, and the 31 to 40 yrs. age group appear to have less indirect access when compared with other age groups. This may be a result of a lack of knowledge, disconnection with their heritage or inability to access traditional resources, due to the expenses associated with harvesting, while younger people may be learning and accessing foods and materials with their grandparents.

Similar results from Q2 for direct and indirect access to food were found for the freshwater/land environment, where 72% of respondents agreed they have the means to access inland foods directly and 71% access inland food resources from others (Likert-like scale 6 to 10). It was found that 62% of members strongly agreed (Likert-like scale 8 to 10) to accessing food themselves or have others provide foods for them and recognizing their rights. Access to food either directly or provided by others was similar.

\textsuperscript{27} Connected for the purposes of this study refers to either directly or indirectly accessing foods or having the knowledge of where the member’s rights are to access food.
to the results for ocean foods, although there appeared to be more variation between age groups.

Increased pressure from other First Nations and non-First Nations on Kitsumkalum fishing grounds over the past 10 yrs. was reported as 39% and 59% (Likert-like scale 6 to 10), respectively. Other First Nations likely remain within their respective territories and continue to fish at their traditional fishing locations, whereas new residents or mainly non-First Nations visitors often occupy any open area, as allowed by the B.C. Fishing Regulations.

Food insecurity and decreased nutrition in the diets of Aboriginal Peoples due to reduced access to traditional foods has already been well documented (Chan et al, 2011; Schuster et al, 2011; Kuhnlein et al, 2013; Willows and Farmer, 2013; Wieland et al, 2016).

Reduced access is partly a consequence of being traditionally forced onto federal Indian Reserves during colonization, where either traditional use areas were usurped by authorities for other purposes, or travel to harvest foods became difficult, due to the logistics involved and resources required for such an endeavour (Wieland et al, 2016). Other reasons for reduced access include the declining abundance of some resources, lack of time to harvest, and government regulations such as “no go” zones (Chan et al, 2011).

Chan et al (2011) showed that First Nations who live on the coast of B.C. consume more traditional ocean foods than other First Nations in the Province and less terrestrial resources such as mammals, wild bird, wild plant roots, shoots and greens and tree foods. For example, the seaweed species, Laver, is consumed by 57% of Zone 6 First Nations (the Pacific Maritime/Subarctic Northwest Coast Ecozone, which includes Kitsumkalum), compared to 34% in all of B.C., while wild berries and mushroom consumption is similar across the entire Province.

Of those who directly accessed foods from Zone 6, 31% fished, 28% collected seafood and 23% collected wild plant food (Chan et al, 2011). Although the study results include five others on-reserve communities, four of which are located on the coast and
one inland on the Bulkley River, they show much smaller percentages of people accessing seafood directly compared with the results found in this study, where 75% of Kitumkalum members both on and off-reserve, accessed ocean foods directly, while 81% were provided ocean foods by others. The high percentages from Kitumkalum study corroborate well with the results of Chan et al.'s (2011) study, which showed that 91% of First Nations households in B.C. would like to increase their consumption of traditional foods.

Impacts to Aboriginal rights caused by resource developments, such as the loss of harvesting traditional foods from a certain area, reduced access to tribal lands or fishing areas and impacts to title can be compensated through Impact Benefit Agreements (IBAs) or Community Development Agreements (CDAs). The challenge is to identify the predicted impacts, ascertain ways to mitigate, quantifying in monetary terms for the impacts that cannot be mitigated, and then negotiating fair compensation. For the PNW LNG project, impacts to Aboriginal rights were determined to be at a moderate level for all six of the potentially-affected Tsimshian Nations. However, these impacts have not yet been specified, especially for the cumulative effects scenario. Although effects to Aboriginal title were deemed by PNW to be impossible to determine, the company has committed to continue to seek direction from the Crown on the Aboriginal title question and to work with Aboriginal groups to negotiate IBAs (Stantec, 2014).

As demonstrated by the results of this study regarding access to traditional foods and the results from other relevant studies, it is clear that resource developments affect access to traditional foods and use areas in two ways: 1) direct loss from industry’s presence, and 2) indirect loss of access due to potential affects from physical and chemical changes in the environment that could affect the availability of food. These aspects are extremely important to consider when developing mitigation measures and compensation offerings. However, if reduced or lost access to traditional harvesting areas cannot be mitigated, then adequate financial compensation may provide the affected Indigenous group with the option of mitigating the effects in other ways appropriate for their people, including greater capacity for accessing traditional resources in other geographic areas within their respective territories.
A PROPOSED FRAMEWORK FOR INDIGENOUS PEOPLES

5.1 Why Do We Need Another Framework?

With the availability of several sustainable development frameworks, why is it important to develop another one? As discussed in this thesis, deficiencies exist in the current methodology (the environmental assessment process) associated with the assessment of benefits and impacts from resource developments, the agreement making process and linkages to social and environmental impact assessments, and the management of cumulative effects. Additionally, while significant efforts have been made to address environmental issues arising from large resource developments, economic security and social equity require more investigation in order to develop mitigation measures to further the sustainable development objective. Furthermore, there is currently no framework available to effectively manage for boom-bust dynamics that will inevitably occur with the implementation of large resource developments like those proposed in northwest B.C.

While three of the frameworks discussed in Section 2.4 are most relevant to the new proposed framework, one of the mentioned frameworks is only relevant to Step 1. The Seven Questions to Sustainability (MMSD, 2002) incorporates important engagement aspects with Indigenous Peoples and includes environmental considerations, as well as long-term monitoring and management through synthesis and learning. The Organization for Economic Co-operation and Development (OECD, 2016) Framework also addresses long-term viability, especially when assessing projects and the need for shared value.

The Seven Questions to Sustainability (MMSD, 2002) was developed for the Tahltan and their partnerships with the mining industry, which was already well-established. Due to the long history of mining in their territory, their participation in benefits from projects was not of the same concern, as it is for LNG in northwest B.C. Conversely, the OECD Framework (2016) for the Extractives Industry does not address Aboriginal issues at all and focuses only on shared value benefits. Due to ETE disparity between Aboriginal and non-Aboriginal Peoples in B.C. and the fact that LNG developments are a
new phenomenon in this region, a framework was needed that adequately considers these challenges.

Additionally, this proposed framework is specific to boom-bust economies often experienced in northwest B.C., as described in Sections 2.1.4 and 2.1.5, which neither the Seven Questions to Sustainability (MMSD, 2002) or the OECD Frameworks appear to consider.

Social Impact Assessments (SIA) in Canada conducted by proponents often only examine the environmental impacts affecting continued access to traditional use areas, without also assessing how Indigenous Peoples may benefit from the development or how socio-economic impacts are experienced disproportionately as a vulnerable sector of society. This method of SIA is contrary to international best practice as identified by the International Association for Impact Assessment (IAIA) guidance document (Vanclay et al, 2015), which notes that benefits can be enhanced by sharing infrastructure, providing social investment for the development of community strategic sustainability plans, facilitating the maximization of local content (contracts and jobs) and developing strategies to remove ETE barriers.

Community Development Agreements (CDAs) and Impact Benefit Agreements (IBAs) are often considered to be the mechanism that will provide benefits to Indigenous Peoples through payments, revenue sharing, contracting commitments, and training and employment opportunities, while at the same time facilitating engagement and monitoring of environmental concerns, leading to sustainable communities (Fidler, 2010). In contrast, a mining industry representative noted that while agreements negotiated with affected Nations were comprehensive, it was unclear whether socio-economic issues such as housing, access to healthcare or ETE barriers were being addressed by the band. Furthermore, one industry representative noted the frustration of negotiating with advisors to the Nations, who appeared to have little interest in coming to an agreement as part of the process.

Another deficiency in the existing frameworks is the management of cumulative effects by governments using an integrative approach. Governments are segregated by
departments and often operate in silos. The Federal, Provincial and First Nations Governments need to integrate their departments in order to function more cohesively and manage natural resources from a cumulative effects perspective.

Although challenging, the establishment of multi-stakeholder groups to monitor key indicators is considered to be essential by some researchers to manage cumulative effects (Franks et al, 2010; Uhlmann et al, 2014; Boutilier and Black, 2013). This can only occur with training, good governance and consensus among parties.

Porter et al (2013), through a review of 30 case studies of collaborative work, recognized that the most prevalent challenge was a lack of accountability from the participants regarding any negative impacts or failures. In addition, the sharing of information to better monitor impacts requires power-sharing among stakeholders, which often results one or more stakeholders not wanting to collaborate. Therefore, when setting up information sharing to facilitate transparency and trust among different stakeholders and First Nations, it is important to research other experiences and implement lessons learned in the process. Regardless of the challenges, the success of such an endeavor results in better resource utilization and enhanced innovation and creativity through a multi-disciplinary group, where long-term solutions to problems can be achieved (Porter et al, 2013).

Although employment opportunities offered by resource development companies and efforts made to diversify the local and regional economy during the boom are very important, it is still essential that social issues such as access to housing and healthcare be addressed at the same time. If people cannot afford to live in the region, the availability of jobs or opportunities to start businesses becomes a moot point. In addition, if economic diversity only becomes viable during the LNG construction phase, reduction of impacts related to the bust period becomes difficult to mitigate. The development of a collaborative regional economic development plan (Esteves and Ivanova, 2015), followed by the development of a social and economic impact management plan that includes committed governance arrangements (Esteves and Ivanova, 2015), would provide the tools necessary to promote economic diversification, while at the same time addressing effectively the pertinent social issues.
A new framework is required to incorporate the above deficiencies in the planning, governance and management of potential benefits and impacts arising from large resource developments. This proposed framework is specific to Indigenous Peoples as their vulnerabilities and resilience levels are different than non-Indigenous Peoples, due to the disparities in education and income levels and their reliance on the land and water for sustenance and cultural uses. However, some aspects of this new framework could be used to address potential benefits and impacts for non-Indigenous vulnerable Peoples as well. Similarly, although the framework was developed for the LNG industry, other extractive companies could use the framework in order to better moderate boom-bust dynamics that could potentially affect Indigenous Peoples.

5.2 A Proposed Framework specific to Indigenous Peoples

This proposed framework as shown in Figure 23 builds upon the Seven Questions to Sustainability Framework (MMSD, 2002) and the most recent OECD (2016) framework by incorporating challenges and opportunities specific to Indigenous Peoples, while also addressing boom and bust dynamics typical of large resource developments in resource-dependent communities. Furthermore, this framework provides a guide on how to enhance benefits and minimize impacts to Indigenous Peoples from large resource developments in a sustainable development context, within a region historically dependent on natural resources that continues to be subjected to the volatility of global markets.

All steps proposed would be initiated and preferably conducted by the Indigenous group who has an interest in planning for large resource developments such as LNG and leveraging from these types of developments to contribute to sustainability in their communities. However, for some groups, various levels of assistance may be required depending on the internal capacity to follow through with each step. Additionally, funding would likely need to be secured to initially implement the proposed framework, with the intention of processes being integrated into the existing governance, leadership and management framework over time. Regardless, of who implements each step of the proposed framework, engagement with the community will be important as strategies, plans and policies are developed that will provide guidance over time.
Step 1: Characterize the community, document vision and values

Step 1 involves surveying the community to characterize the socio-economic status of the membership and collect information that will provide for a good understanding of the challenges people face economically, as well as the specific needs and desires of individual members within the Nation. Whether the community hires a consultant or conducts the surveys themselves, engagement with members of the Nation, as was conducted for this research (Section 3.2), is essential to ensure surveys are tailored to the information needs of the community and are culturally appropriate.

Each Indigenous group is unique in terms of their culture, socio-economic status, needs, aspirations, and environmental conservation requirements. It is important to collect relevant data and information in order to provide a detailed and representative understanding of the community, which the Nation’s leadership and management teams can then use to develop appropriate programs for catering to specific needs and aspirations. Moreover, baseline data can be used for future monitoring to determine whether needs are being met and standard of living is improving.

The importance of this step is demonstrated by Banks (1994), who surveyed people living near a mining area of Papua New Guinea, as described by O’Faircheallaigh (1998). The survey showed that the top 10% of income earners were receiving 54.8% of cash income, while the bottom 50% earned only 2.6%. Without surveys, it is very difficult to know whether social equity is occurring within a community, or only a select group of individuals are benefiting from opportunities generated by the extractives industry. While O’Faircheallaigh’s (1998) paper described a framework for social equity, rather than sustainable development, Step 1 of O’Faircheallaigh’s framework was to investigate the factors that create inequity among people in a population, which also is one of the reasons behind Step 1 of this framework.

Furthermore, surveys on ETE, housing, healthcare and other social, economic and cultural issues the Indigenous group has identified as important to their culture, need to be comprehensive in order to characterize the members’ socio-economic status and plan

28 Banks (1994) paper could not be located
for a better future. While this additional survey requires anonymity, due to the sensitivity of the questions, this information is important to correlate social barriers with ETE by gender and age groups.

**Figure 23.** Proposed Sustainable Development Framework
Step 3 is proposed to occur concurrently with all other steps in the Framework

Randomly selected participants with mail-outs and paid return postage with the promise of a reward for filling in the surveys will provide more accurate and abundant results than an on-line survey, as people who are vulnerable may not have access to a computer and prefer to receive payment for participating in the survey. In order to include
valuable perception-based questions as part of the survey, such as those inquiring about access to health care services, it is necessary to use a Likert-like scale.

The need for ETE was identified as the No. 1 Theme for developing sustainable communities. ETE information can be used by both industry and the community as a baseline template for the development of specific training programs tailored to identified or anticipated opportunities. Similarly, the survey results could also potentially identify what types of local Indigenous businesses might be successful in providing services and goods to proposed developments within the region, as well as the type of assistance needed to enhance procurement opportunities.

In order to prepare for subsequent steps in this framework, a vision for the future must be documented through engagement with community members based on community values for culture, economy, education, governance, health, infrastructure and housing, lands and resource and social issues. The B.C. First Nations Comprehensive Community Planning (CCP) process, as described in Section 2.3.1, has facilitated engagement and documentation of a high-level plan outlining what the band’s membership would like their community to be in the future, based on their values.

While the Seven Questions to Sustainability Framework (MMSD, 2002) considers people’s wellbeing from a social, cultural, economic and environmental when evaluating a project, characterization of an individual’s status in terms of ETE, social and economic barriers, and aspirations is not specifically recommended for long-term monitoring purposes. This proposed framework considers the same aspects as the MMSD Framework for people’s wellbeing, includes characterization of the community, and addresses potential benefits and impacts for several projects within a particular geographic area such as a First Nation’s Territory.

The OECD Framework for the extractives industry (2016) includes the development of an effective and transparent monitoring and evaluation system to identify whether common goals and objectives identified by the stakeholders are being met, as proposed in this study through the collection of baseline information. However, there is no distinction in the OECD framework between civil society and Indigenous Peoples.
Monitoring programs, if not appropriately designed, may end up not being able to effectively characterize challenges specific to Indigenous People to take advantage of benefits from large resource developments.

**Step 2: Examine internal governance structure and identify challenges and opportunities for participation in the LNG industry**

Although not collected for this thesis, information regarding governance, leadership and management structure, existing band policies and procedures, and land rights and title is necessary to collect in Step 2 and utilize in Step 3. Governance was identified as the No. 2 Theme during this study (Section 4.2), and the Harvard Project has cited good governance as a pre-condition to long-term sustainability (NCFNG, 2007).

Currently, B.C. First Nations practice varying degrees of self-governance, where decision-making authority can rest with the elected Chief and Council or Hereditary Chiefs. Despite the chosen governance structure by the Indigenous group, in order for a community to sustainably develop, it must have good governance and a well-defined decision-making process. Also, clear policies are needed to inform government and industry on what the expectation is for engagement regarding the use of natural resources within their respective territories. Policies need to be developed similar to those developed by the Northern Secwepemc te Qelmucw Leadership Council, and the water law created by the Nadleh Whut’en and Stellat’en First Nations in response to the Northern Gateway proposed pipeline (APTN, 2016).

Step 2 would also include documenting the band’s strength of claim to rights and title within their respective territory, which would facilitate an understanding where gaps in traditional use information may exist. A remnant of colonization, as described in Section 4.3.1, is the loss of culture caused by an interruption in cultural teachings, which is exacerbated with the passing of elders who possess significant traditional knowledge. This presents challenges for indigenous individuals to establish a re-connection with their own culture, which can be important for healing and dealing with social historic barriers, a Theme that was ranked No.1 by First Nations and No. 3 by all sectors.
Although there are many different programs available for Indigenous Peoples, one First Nations interviewee stated that there is a lack of provincially and federally-funded measures to lift people out of poverty. In response, Indigenous groups look to resource extraction companies for support to help fund off-reserve anti-poverty solutions through employment, contracts and revenue-sharing, which often offer some kind of assistance.

The last component of Step 2 is to identify the challenges and opportunities that can come with large-scale LNG projects, including ways to enhance benefits and minimize impacts. Challenges for the band membership can be identified from the questionnaire surveys, as was conducted for this research. The Q1 information was collected with contact information that was also used as the basis for an ETE tracking and recruitment database for LNG and non-LNG related jobs. The Q2 information, although surveys were anonymous, provided socio-economic and cultural use information important for designing socio-cultural programs that can target specific age groups or gender.

Opportunities for employment and economic development must be identified to facilitate the enhancement of these benefits. Once identified, it is important to assess if the employment opportunity or the proposed business venture could last beyond the construction phase, as discussed in Section 4.1.4. If resources are allocated to programs that do not account for longevity in careers and businesses, the opportunity to leverage from the LNG industry and benefit in the long-term will be lost. However, IBAs and CDAs may provide sufficient funds to invest in other non-LNG opportunities to assist the band in sustainable development. An economic policy outlining the needs and spending priorities will be important to balance investments with other expenditures like social programs.

Finally, any challenges or opportunities pertaining to predicted environmental impacts should be investigated and documented.
Step 3: Work with government and industry to negotiate agreements, incorporate shared decision making, participatory environmental monitoring and partnerships.

During a boom at the Alberta oil sands, the difference between the ability of some Aboriginal communities to benefit more than others was dependent upon their access to natural, human, financial and social capital (Parlee, 2015). Natural capital, defined as the natural resources that can facilitate economic development (Parlee, 2015), is the most challenging aspect for a Nation, due to variations in the size and geographical nature of territories among First Nations in B.C. Some Nations are fortunate to be located in an area of resource wealth that has not been over-exploited and which already has access to markets. However, if a Nation endowed with natural capital does not have sufficient human or financial capital, it can be very difficult to benefit from resource development agreements, especially if the management and planning associated with the agreements has not considered measures to promote sustainable development. The negotiation and implementation of an agreement itself requires qualified human capital to ensure that benefits are acquired and impacts are adequately mitigated.

Step 3, is an iterative and on-going initiative, where there is a need to develop partnerships and collaborative working relationships with industry and government to facilitate shared decision making and avoid, mitigate or compensate for impacts to Aboriginal rights and title. This requires timely updates on Aboriginal case law by the governments, with an understanding by companies that if they want to increase certainty regarding project approvals, it is best to foster good relations with those who claim rights and title to the land, rather than rely on the governments’ strength of claim assessment to determine the level of engagement (see 4.2.2).

One of the Governance subthemes was identified as ‘Working Together with Improved Coordination’. Although First Nations can encourage companies and governments to work together, they must have governance structures that will support working collaboratively.

Although FPIC is likely to be interpreted by the courts to mean that Aboriginal Peoples in Canada do not have the legal right to veto a project (Section 2.3.1), there are
several examples of court cases where Aboriginal Peoples have succeeded in preventing a project from proceeding (Meech et al, 2014). Interestingly, the Tahltan incorporated the requirement for voluntary consent as part of the Seven Questions to Sustainability Framework (MMSD, 2002).

Many projects have proceeded with consent from the Tahltan within Tahltan Territory, with the exception of a few that were located in high valued cultural and spiritual areas. For example, although the Mount Klappen project was slated to become a metallurgical coal mine, the Tahltan protested this development for ten years. Finally, after the Tsilhqo'tin decision in 2014, the B.C. government purchased the coal licenses from tenure holder Fortune Minerals for $18.3 million in 2015, putting an end to the controversy. It was noted that the government and the Tahltan First Nation would need to develop a “shared vision” for how mining should proceed in their territory before the company could buy back the leases (Business Vancouver, 2015). Therefore, it is prudent for governments and industry to engage early with potentially affected First Nations to determine whether the resource development conflicts with cultural values.

Prior to negotiating IBAs, a Nation should have a good understanding of the specific needs of the community regarding environmental conservation of important cultural use areas, economic security and social equity. A good understanding of how the Project will affect individual members is essential and can be derived from information collected in Step 1. With this information, negotiators will be better positioned to request benefits that will contribute to sustainable development within their respective territories, as well as request how particular environmental concerns are to be addressed.

Another aspect for a Nation to consider is the potential for partnerships as a mechanism to contribute to sustainable development. Several bands throughout B.C. have developed successful partnerships or joint ventures with established businesses. For example, the Osoyoos Indian Band has developed partnerships with government and industry and created several businesses, wineries, resorts, a golf course and heritage centre, where each business is assessed for a predetermined minimum internal rate of return (Zhang and Swanson, 2014).
For socio-economic and environmental cumulative effects to be managed effectively, there needs to be much more integration between the relevant departments in Indigenous, Federal and Provincial governments. In comparison, the industrial and economic development sectors are normally more connected within the organization as a necessity in order to achieve the objective of becoming economically sustainable, as defined in Section 2.2.

**Step 4: Develop a strategic sustainable development plan inclusive of department specific strategies and action plans. Ensure boom and bust LNG phases are considered for both strategic development and action plans.**

“Having a plan is very important to all communities and also for individuals on how they are going to move forward. There are various communities taking responsibility for themselves. Being responsible for themselves was taken away from First Nations through the laws of Canada, with separation of families and communities (First Nations representative).”

The Seven Questions to Sustainability Framework (MMSD, 2002) addresses several aspects of sustainability for First Nations Peoples in B.C. However, instead of developing a plan to achieve sustainability at the community level, the Framework is designed to assess each project as it is proposed.

Long-term visioning and implementation strategies are recommended as Step 1 of the OECD Framework (2016) in terms of economic development and creating shared value with host communities. As with other elements of the framework, recommendations are made on what host communities and the extractives industry can do individually and cooperatively with civil society. However, there is no discussion on Indigenous-specific issues such as traditional and cultural use of the land where projects are proposed or the difficulty in participating in the benefits derived from the industry.

With high-level direction from the community on the vision and values as identified in Step 1 and from information collected in Steps 2 and 3, strategic sustainable development plans can be developed by leadership and the band administration to be screened through the community as a draft document for input prior to finalization. This
strategy will guide the Indigenous groups towards a more sustainable future. If compartmentalized, specific sections could be shared with governments and industry to inform others of customary Indigenous laws, important cultural or spiritual sites, and any other relevant information the Nation wishes to share.

The sustainable development strategy would include: existing and future governance, leadership and management structure, as envisioned by the membership, accompanied by an organizational chart outlining each position and the associated duties; a set of policies and procedures for the functions of the government, including how the band will negotiate with government and industry on resource agreements; a system of record and document control; and department specific strategic plans with action plans.

The development and implementation of economic management policies and procedures are important to include in a sustainable development strategy. As discussed in the literature review, financial benefits acquired through CDAs and IBAs are similar to resource revenues collected both provincially and federally. If these funds are managed well, these benefits could provide for the stimulation required to build human capacity, diversify the economy and contribute to sustainable development in communities.

Similarly, environmental management and resource management policies are essential to include in the strategy to protect and conserve important traditional use areas. Although potential environmental effects specific to LNG have been assessed, especially in terms of continued access to traditional foods and use areas, a more thorough analysis of which species and geographic areas are of importance to an Indigenous group is needed. Such a policy could inform others on what type of industry the Nation is in favour of and whether there are specific sacred and spiritual places to avoid. The policy could also outline environmental management and monitoring expectations within the Nation's territory.

Documentation of the vision from the CCP for economic development, socio-cultural teachings and environmental priorities are useful to provide the necessary direction for strategic and action planning. Economic development initiatives can include a training and employment component and could be based on data and information
collected in Step 1. If economic develop plans are strategic and consider the potential to leverage from LNG developments for sustaining beyond the end of the construction phase, funding could be accessed from the Federal Government, as described by a government representative.

“The Strategic Partnerships Initiative (between ourselves and Natural Resources Canada) has a West Coast energy focus, in order to position First Nation communities to take advantage of opportunities by increasing their capacity as investment partners or to invest themselves. They could also partner with other organizations that provide skills training.”

Additionally, as part of the strategic plan, the economic development department of an Indigenous group will need its own strategy to leverage from large resource developments and prepare businesses for the end of the construction phase, similar to what the mining industry is now including in their corporate social responsibility efforts regarding mine closure (Xavier, 2013). If an Indigenous group is successful at starting a new business venture or enhancing an existing enterprise when LNG construction begins and markets can be developed to diversify the client base of the business, then local economic diversification can exist beyond the end of construction, when employment is drastically reduced and many contracts come to an end, with relatively few jobs remaining to maintain the pipeline and operations at the LNG plant(s).

Socio-cultural teachings would likely originate from the CCP and be very connected to environmental priorities. These strategic and action plans would need to consider internal plans and external larger plans developed with other First Nations and government entities, such as the land and resource management plans and marine use planning initiatives in B.C. The socio-cultural strategy could also provide some guidance on how to integrate with off-reserve organizations and reintroduce members to the culture and traditional use and knowledge of the Nation, as discussed in Section 4.3.

Detailed operational planning (action plans) for each department would identify priorities, needs, budget, timeline, anticipated outcomes, and monitoring tools for the phases of project development within the Territory. Action plans are needed to address
economic development initiatives, required educational and training skills, and ETE supports. The implementation of these action plans would enhance benefits and mitigate the negative impacts from boom and bust dynamics that inherently come from large resource developments, as discussed in Sections 2.1.4 and 2.1.5.

Tailored programs should complement one another and be delivered on a prioritized basis. Although Social Barriers were ranked by all sectors as No. 3, First Nations ranked Social Barriers as the No. 1 issue to be addressed for long-term sustainability. In comparison, the Supports Needed theme was ranked as No. 4. Therefore, it is imperative that programs be developed to assist individuals in achieving independence, so that they can take control of their lives. ETE initiatives must be planned and implemented with consideration of other supports required for local and regional demands for both the existing and future employment opportunities. Historically, education and training initiatives have been implemented without supports, career counselling, or economic development initiatives required to foster long-term careers for individuals.

Social historical barriers, such as access to affordable housing and adequate healthcare, could be addressed through action plans, such as those discussed for affordable housing projects and Housing First programs. Without these basic needs being met for some people, participating in ETE will be impossible. Funding is limited to address these issues, and as a component of Step 3, it will be important to collaborate with governments on developing programs to provide these types of supports, so people are able to become educated or take employment.

**Step 5: Utilize action plans to monitor and adaptively manage for economic security, social equity and environmental conservation initiatives**

Social, economic and environmental benefits and impacts must be managed and monitored, both at the project level and the cumulative effects level. As discussed in Section 2.1.3, the Auditor General (2015a) recommended that the provincial government provide clear direction and the mandate for the Ministry of Forest, Lands and Resource Operations to manage cumulative effects. Without the leadership delegating this
responsibility internally, effective mitigation and management will not occur at the local level.

While the Seven Questions to Sustainability framework contains seven goals (questions), ideal answers, example indicators and metrics that are applicable to any type of development, considers Indigenous Peoples values, covers all phases of development and considers impacts in the long-term, an assessment of cumulative social, economic and environmental effects spatially does not appear to be addressed (MMSD, 2002). It is clear that cumulative effects must be monitored and measured in order to confirm that sustainable development objectives are being met.

The OECD Framework (2016) Step 5 incorporates the need to monitor and evaluate regularly. However, because the focus is on shared-value, environmental impacts and monitoring are likely not to be included. Without considering all aspects of sustainable development, it is difficult to measure against identified goals and objectives documented in a sustainable strategic development plan.

Although the Environmental theme was ranked No. 5 and only 13% of First Nations interviewed mentioned it, environmental issues are clearly a concern to the Kitsumkalum members interviewed, as observed by the researcher during community meetings and as commented on during the LNG environmental review process. The Likert-like scale data (6 to 10) showed that 75% of Kitsumkalum have the means to directly access food from the ocean, while 81% access ocean foods from others. A slightly smaller percentage have means to access foods from land and freshwater ecosystems (72%, Likert-like scale 6 to 10) and 71% are provided foods by others (Likert-like scale 6 to 10). These data indicate protection of these traditional use areas is extremely important to members of the Nation. Additionally, detailed environmental studies have been conducted for proposed LNG facilities projects in the region with the participation of most of the potentially affected First Nations. Conversely, the level of effort to address socio-economic issues has been minimal.

Although there have been many studies in the Prince Rupert area related to proposed project developments, it appears some data collection is still needed. For
example, although mapping of seaweed and seagrass, which is critical habitat for many marine species, has been conducted in the affected areas of the proposed projects no studies have investigated how specific harvesting sites could be affected by increased levels of air shed contaminants (R. Gemeinhardt, personal communication, March 21, 2017).

One idea being suggested by LNG proponents is transplanting seagrass to new areas or restoring impacted zones, in order to maintain this very important habitat for salmon and other marine species. Although seagrass has been successfully transplanted in the United States, southwest B.C. and China, only one initiative has been successful at higher latitudes in Sweden, where low-light conditions, a short growing season, ice-scouring and variations in substrate all proved challenging for the sea-grass to take hold (Eriander et al, 2016). Likewise, conditions along the north coast of B.C. may also prove to be difficult for eelgrass transplantation to restore impacted areas, requiring the need for other methods to be investigated.

In a review of 1786 trials of seagrass transplantations, including 26 species in 17 countries, of which 50% were eelgrass (Zostera marina), it was found that eelgrass transplants with appropriate planting techniques were successful in areas of good site selection, and the planted area was large (>100,000 shoots/seeds planted) to minimize the risk of die-off (Katwijk et al, 2016).

Baseline data collection, monitoring and adaptive management are crucial in order to ensure access to traditional foods and use areas can be maintained over time. Similarly, any mitigation measures conducted by the proponent to compensate for loss of marine habitat requires monitoring and adaptive management over the long-term.

As industrial activity increases in the region with the approval of a number of LNG projects, the projected cumulative air shed impacts determined by modelling require more on-the-ground measurements, validation and frequent updating. An air quality monitoring network with stations located near important receptors is essential to confirm air quality predictions made in the model and to update the model with more accurate data. For example, up-to-date, site-specific meteorological data would be an important input to the
air shed model, including variations in wind speed and direction, temperature, humidity, and precipitation, which can differ dramatically from year to year.

Despite the numerous studies, Pickard et al (2015) identified key risks to salmon habitat in the Skeena River estuary and critical gaps in understanding, including: the impacts caused by sea disposal of dredged material; the extent of dredging and characterization of sediment contaminants in projected areas; associated reduction in water quality (turbidity/TSS, phosphorous, nitrogen, sea surface temperature, dissolved oxygen) due to dredging; eelgrass distribution; zooplankton density and diversity; and adult salmon abundance, smolt survival, density, growth and residence time.

It is essential to develop monitoring programs to ensure environmental impacts and mitigation measures are balancing out adequately over time. The location, frequency, species in question and methods employed are all very important components of a monitoring program. For example, surveying eelgrass distribution using a towed video system in Chatham Sound, where the Prince Rupert LNG projects are proposed, should be conducted in July, when the eelgrass is at its maximum yearly biomass. In addition, care should be taken to perform the survey at the same tidal height every time in order to assess correctly any changes to the eelgrass beds (Ocean Ecology, 2013).

For the baseline data collected at Flora Bank, there has been considerable controversy over the seasons and methods used to characterize the aerial extent of eelgrass beds in the area. Consequently, these discrepancies can result in potential impacts being underestimated among different reviewers of the projects, with restoration measures being inadequately implemented. In turn, this can end up affecting the long-term viability of the First Nations food fishery.

Five of the six potentially affected Tsimshian Nations have formed a partnership to monitor the effects of LNG developments on the B.C. North Coast through the Tsimshian Environmental Stewardship Society (TESA). The group meets regularly to discuss the type of research and monitoring programs needed to verify the predictions made in the environmental assessments for these projects. In addition, the Lax Kw’alaams and Metlakatla Nations have signed an agreement with the Federal and Provincial
governments to participate in the implementation of the environmental commitments, as identified in the EA process for the PNW LNG project (An Agreement on Environmental Monitoring of the PNW LNG Project, 2017). The Environmental Monitoring Committee will include one representative from each of the two First Nations’ governments and one from each of the Federal and Provincial Governments, while a Technical Committee will be comprised of representatives from the two Nations, and one each from the Canadian Environmental Assessment Agency, Department of Fisheries and Oceans, Environment and Climate Change Canada, Transport Canada, and the Prince Rupert Port Authority, B.C. Environmental Assessment Office, Ministry of Natural Gas Development and the Oil and Gas Commission (An Agreement on Environmental Monitoring of the PNW LNG Project, 2017).

The inclusive participation of First Nations in the monitoring and oversight of environment compliance of PNW LNG, which is likely to be the first project constructed in northwest B.C., is a progressive step towards co-management of natural resources. However, several other Aboriginal groups are likely to be negatively affected by the project and do not have any legal rights regarding participation in discussions about the project’s environmental impacts. While the Agreement on Environmental Monitoring of the PNW LNG Project (2017) states that one of the intentions of the agreement is to disseminate results of the environmental monitoring activities to all interested First Nations and the public, only certain information, interpreted data and decided-upon monitoring programs are available for viewing. In other words, other First Nations who live in the Prince Rupert area or live upstream and depend on migrating fish for sustenance and commercial income will not participate in the discussions or be able to access raw data and information. In addition, the project’s contribution to cumulative impacts remains a concern, as the Lax Kw’alaams and Metlakatla/Government Agreement mentions cumulative impacts management only in terms of encouraging consistent data collection with other environmental monitoring activities.
6 CONCLUSION

In pursuit of answering the research questions for this dissertation, the following are the key findings found in the study. These key findings are also listed in Table 15 along with the academic and applied contributions of the research.

1) The barriers that need to be overcome in relation to LNG developments in northwest B.C. in order to enable First Nations to participate in benefits are: education, training and employment (ETE) (Theme ranked as No. 1); supports needed (Theme ranked as No. 4) for ETE, such as childcare and mentoring; and social issues and barriers (Theme ranked as No. 3), including addictions, lack of housing and adequate healthcare. Currently, funding is available for ETE and some supports. However, addiction treatment for northern B.C. is severely underfunded compared to southern B.C. and many B.C. First Nations continue to struggle with accessing affordable housing and adequate healthcare. In terms of long term benefits for First Nations derived from LNG developments, only half of the government representatives (50%), 40% of the economic development sector, and 15% of each of the mining sector and First Nations mentioned the ETE subtheme ‘Long-term Employment and Careers’, with no mention by LNG. Although ETE is considered by all sectors to be the most important barrier for First Nations to sustainably develop, these results indicate that many people are focussed on the short-term opportunities from the LNG construction phase.

2) Commonalities and differences in views among industry, government, economic development and First Nations were observed in terms of what is needed to move First Nations towards sustainable development. ETE was identified as the most important by all four sectors, except First Nations, who ranked it No. 2. First Nations ranked social issues and barriers as No. 1, while all other sectors ranked this theme as No.2, except the government sector who ranked it No. 3 (33%).

Governance was ranked No. 2 out of five Themes by all of the different sectors. Results of the study show that while government (83%) and First Nations (50%) see the need for First Nations ‘to lead the way to a sustainable future’, LNG (80%), mining (57%) and economic development (60%) sectors mentioned governance in terms of ‘working together and improving coordination efforts’. These differences in views may be due to
the current focus on self-government by the government sector and First Nations, while industry and economic development sectors are focused on the approval and implementation of projects, which requires cooperation and coordination.

3) Traditional cultural activities on the land and water can continue despite the loss of access and use of some areas due to LNG developments, through increased revenues to facilitate accessibility and on-going participation in environmental management and monitoring programs. Environmental impacts are of concern to First Nations, despite the low percentage of individuals who mentioned the Theme (13%) in the interviews, when compared with LNG representatives (60%). The difference is likely a result of each sector’s perspective. From the First Nations perspective, their involvement in the extensive environmental assessment processes for LNG projects and their participation in environmental management and monitoring activities, has addressed most of their environmental concerns, while socio-economic cumulative effects were not given the same attention. Conversely, the LNG industry in northwest B.C. has experienced a lot of media attention regarding the PNW LNG project, where a few First Nations groups are opposed to the project, as they believe critical fish habitat will be impacted.

4) Recommendations to ensure that LNG developments can serve as a catalyst for long-term sustainable planning in First Nations communities are provided in the proposed framework. While several sustainable development frameworks exist to address different challenges and opportunities faced by First Nations in B.C. in relation to large resource developments like LNG, the proposed framework incorporates the need for community characterization, a strategic sustainable development plan based on the vision of the community, good governance, and improved shared decision making and partnerships, in order to better facilitate sustainable development. Additionally, participatory and on-going monitoring is necessary to adaptively manage for the implementation of action plans. Although similar to other frameworks, this framework aims to monitor the community to ensure social equity and economic stability, maintaining access to cultural use areas and environmental protection of traditional foods, and the development of specific plans to address boom-bust dynamics, which inevitably will be generated by large LNG developments in northwest B.C.
Large LNG resource projects can serve as a catalyst for long-term sustainable development, provided governance by the Band includes the careful management of resource revenues and other benefits to facilitate independence. Through improved shared decision-making and partnerships with industry and governments, greater certainty in project approvals will improve investor confidence, while increased participation of First Nations will provide certainty in enhancing benefits and conserving important traditional use areas. With the implementation of this multifaceted approach, benefits can outweigh impacts and projects can contribute to sustainable development in First Nations communities.
### Table 15. Key Academic and Applied Contributions from Research

<table>
<thead>
<tr>
<th>Chapters</th>
<th>Research Question</th>
<th>Contribution (Academic)</th>
<th>Contribution (Applied)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sections 4.1 ETE Theme, 4.3 Social Historic Barriers Theme and 4.4 Supports Needed Theme</td>
<td>1) What are the barriers that need to be overcome in relation to LNG developments in northwest B.C. so that First Nations can participate in the benefits?</td>
<td>Barriers that need to be overcome in relation to LNG developments in northwest B.C. in order to enable First Nations to participate in benefits are: education, training and employment (ETE) (Theme ranked as No. 1), supports needed (Theme ranked as No. 4) for ETE such as childcare and mentoring, and social issues and barriers (Theme ranked as No. 3) such as addictions, lack of housing and adequate healthcare. Regarding long term benefits for First Nations from LNG, only half of the government representatives (50%), 40% of the economic development sector, 15% of each of the mining sector and First Nations, mentioned the subtheme to ETE, long term employment and careers, with no mention by LNG. These results indicate that most people are focussed on short term benefits from the LNG construction phase.</td>
<td>A socioeconomic baseline report was produced for the Kitsumkalum Indian Band with recommendations to address socioeconomic issues. Two of the recommendations have been implemented; a career counsellor, has been hired, and a recruitment database using data acquired during this study is currently being created.</td>
</tr>
<tr>
<td>Section 4 Theme Tables and Section 5, Proposed Framework</td>
<td>2) What are the commonalities and differences in views between industry, government and First Nations in terms of what is needed to move First Nations communities towards sustainable development?</td>
<td>Commonalities and differences in views among industry, government, economic development, and First Nations was observed in terms of what is needed to move First Nations towards sustainable development. ETE was identified as the most important by all four sectors, except First Nations, who ranked it No. 2. First Nations ranked social issues and barriers as No. 1, while all other sectors ranked this theme as No.2 except the government sector who ranked it No. 3 (33%). Governance was ranked No. 2 by all sectors of five Themes identified. Results of the study show that while government (83%) and First Nations (50%) see the need for First Nations to lead the way to a sustainable future, LNG (80%), mining (57%) and economic development (60%) sectors mentioned governance in terms of the need to work together and improve coordination efforts. These differences in views may be due to the current focus on self government by the government sector and First Nations, while industry and economic development sectors are focused on the approval and implementation of projects requiring cooperation and coordination.</td>
<td>Research findings have been presented at a public forum at the University of Northern B.C. campus in Terrace, B.C. and at the Minerals North Conference in Prince George in 2017. The difference in views by various sectors was emphasized during these presentations creating increased awareness.</td>
</tr>
<tr>
<td>Section 4.5 Environment Theme, and Steps 4 and 5 of the Proposed Framework in Section 5</td>
<td>3) How can traditional cultural activities on the land and water continue despite the loss of access and use of some areas due to LNG developments?</td>
<td>Traditional cultural activities on the land and water can continue despite the loss of access and use of some areas due to LNG developments through increased revenues to facilitate accessibility and on-going participation in environmental management and monitoring programs. Environmental impacts are of concern to First Nations despite the low percentage of individuals interviewed who mentioned the Theme (13%) when compared with LNG (60%) representatives. The difference is likely a result of each sector’s perspective. From the First Nations perspective for those interviewed, their involvement in the LNG project environmental assessment processes where environmental impacts have been studied extensively and their participation in environmental management and monitoring activities has addressed most of their environmental concerns, while socio-economic cumulative effects were not given the same attention. Conversely, the LNG industry in northwest B.C. have experienced a lot of media attention regarding the PNW LNG project where a few First Nations groups are opposed to the project as they believe critical fish habitat will be impacted.</td>
<td>This research has identified environmental issues that could affect traditional use areas. Using this information, funding will be applied for by the researcher so the Band can monitor environmental conditions at important traditional use areas.</td>
</tr>
<tr>
<td>Chapter 5, Proposed Framework</td>
<td>4) What recommendations could be made to ensure that LNG developments can serve as a catalyst for long-term sustainable planning in First Nations communities?</td>
<td>Recommendations to ensure that LNG developments can serve as a catalyst for long-term sustainable planning in First Nations communities are provided in the proposed framework. LNG can serve as a catalyst for long-term sustainable development provided governance by the band includes the careful management of resource revenues and other benefits to facilitate independence and an overall contribution to sustainable development. Through improved shared decision making and partnerships with industry and governments, greater certainty in project approvals will improve investor confidence while First Nations increased participation will provide certainty in enhancing benefits and conserving important traditional use areas. With the implementation of this multifaceted approach, benefits can outweigh impacts and projects can contribute to sustainable development in First Nations communities.</td>
<td>From the findings of this research, a framework is proposed to be implemented to address Indigenous Peoples specific barriers to ETE, and manage boom-bust dynamics anticipated to occur when one or more LNG facilities is constructed. Currently some aspects of this framework are being implemented, such as strategic planning for all of the departments within the Kitsumkalum Band.</td>
</tr>
</tbody>
</table>
7 Contributions and Claim to Originality

The originality of this dissertation stems from the multi-faceted interdisciplinary assessment of the potential for large extractive sector projects to contribute to sustainable development of Indigenous communities in British Columbia. Previous studies as discussed in the Literature review have focused on the resource development curse, social impacts from boom and bust dynamics, and poverty reduction in relation to the extractives industries. However, key socio-economic aspects related to large resource developments specific to B.C. First Nations and finding ways to moderate the boom-bust dynamics while planning for a sustainable future have never before been studied at the local First Nations community level.

Additionally, the research provided some insight into the different views among industry, government, economic development organizations and First Nations in regards to large resource developments in northwest B.C., governance and sustainable development.

Finally, the study examines some of the barriers that prevent northwest B.C. First Nations communities from benefiting socially, environmentally and economically from resource development projects within their respective territories, including the challenges of economic diversification for historically resource-dependent communities.
8 Recommendations for Future Research

Although the gap in education and employment is narrowing for the Kitsumkalum First Nation, barriers to ETE are still present. While significant efforts are being made to prepare First Nations to participate in large resource developments by providing education and training opportunities, many people are not ready for ETE, as they have other social barriers to resolve first. In order to effectively remove these barriers, each community must be surveyed to understand where resources can be allocated effectively to allow people to move forward with their lives and contribute to the sustainability of their community. At the municipal and provincial level, a strategy urgently needs to be developed to address addictions, as the levels of service in northern B.C. are currently not on par with the rest of the Province.

Good governance, as described in this thesis, is important for moving communities towards sustainability. While First Nations governance is important to ensure resources are effectively allocated to address individual barriers and invest in future economic development opportunities, while also protecting the Nation’s ability to continue to use the land and water for traditional use, good governance practiced by corporations and the public sector, the Provincial and Federal governments in B.C. is equally important. Shared decision-making and partnership-building requires all parties to participate and delegate management level staff to follow through on policies to achieve these objectives. Shared decision-making and partnership building not only provide for more certainty for both industry and First Nations, but also provide results for participatory management of implemented mitigation measures to maximize benefits and minimize impacts from boom-bust dynamics.

It is clear that large resource developments can contribute to sustainable First Nation communities by providing benefits that outweigh impacts. With the implementation of steps as provided in the proposed framework, the vulnerabilities of First Nations peoples to boom-bust dynamics can be reduced and resilience increased, as well as effectively utilizing resource revenues to promote greater economic security through the development of new businesses or the enhancement of existing ones.
Many First Nations Bands in B.C. are making progress in their economic development through collaborations, partnerships and agreements established with the extractives industry. Future research could focus on determining the key factors that contribute to the success of these Bands. In turn, this information could then be considered in the context of Steps 4 and 5, where strategies and action plans need to be continuously examined and modified to accommodate the evolving needs and vision of the community.

Another potential research study could focus on utilizing the same approach in this study in Australia and Africa to determine similarities and differences. Although it is anticipated that the Framework could be directly applicable to Indigenous Peoples around the world, Indigenous rights and title and the political regime in other jurisdictions may affect the implementation.
References


Halseth, G., Manson, D., Ryser, L., Markey, S., Morris, M. (2014). Constructing rural places in a globalised world: Place-based rural development as seen from northern British Columbia, Canada. DOI: http://dx.doi.org/10.7557/5.3218


Krzyzanowski, J. (2010). Review and identification of research needs to address key issues related to reactive nitrogen (RN) deposition and eutrophication in a Canadian context. Final Report. For: Acid Rain Task Group, Canadian Council of Ministers of the Environment. PN 1450


Onn, A.H., Woodley, A. (2014). A discourse analysis on how the sustainability agenda is defined within the mining industry. *Journal of Cleaner Production*. Doi: 10.1016/j.jclepro.2014.03.086


Province Newspaper. (2013). Western Australia's experience shows B.C. LNG boom may come with a hefty price. David Carrigg/The Province, November 25, 2013 0:740am.


GENERAL QUESTIONS

Please circle ONLY ONE answer that BEST describe your current situation.

1. Are you a Kitsumkalum Band Member?
   a. Yes
   b. No

2. How old are you?
   a. 18 to 25
   b. 26 to 30
   c. 31 to 40
   d. 41 to 50
   e. 51 to 60
   f. Over 60

3. Are you male or female?
   a. Male
   b. Female

4. What is your marital status?
   a. Single
   b. Divorced or separated
   c. Divorced or separated with dependants outside of the home
   d. Married or Common-Law

5. How many dependent children do you have living with you (18 or under)?
   a. None
   b. 1
   c. 2
   d. 3
   e. 4 or more

6. How old are your children now? Please list:
   ________________________________
7. How many adults (over 18) live in your household?
   a. None
   b. 1
   c. 2
   d. 3
   e. 4 or more

8. How many adults living with you are not employed and are on social assistance?
   a. None
   b. 1
   c. 2
   d. 3 or more

EDUCATION YRS PRE-SCHOOL TO GRADE 12 (18 YRS AND UNDER)

9. Do you have children 18 yrs or younger that attend school?
   a. Yes
   b. No

   If No, go to question 21.

10. If Yes, please list, age, how many children you have and what school they attend below.

    Number of Children: ____, Ages: ______
    School:______________________________

    Number of Children: ____, Ages: ______
    School:______________________________

    Number of Children: ____, Ages: ______
    School:______________________________

    Number of Children: ____, Ages: ______
    School:______________________________

    Number of Children: ____, Ages: ______
    School:______________________________

    Number of Children: ____, Ages: ______
11. If your child or children attend Kitsumkalum Na Aska Gyilak’yoo School, you are satisfied with the education/program? (please mark whether you disagree, are neutral or agree on the scale below).

12. In your opinion, are there specifics about the school that need improvement?

13. If your child or children do not attend Kitsumkalum Na Aska Gyilak’yoo School, what is the reason?
   a. Too far away
   b. Prefer my child (children) to go to public school
   c. Prefer my child (children) to go to private school
   d. No space
   e. Don’t offer all the grades
   f. Other reason:

14. If you prefer your child or children go to public school or private school, what is the reason?
   a. curriculum
   b. social reasons (more kids in public school)
   c. confidence in teachers
   d. extra-curricular activities
   e. all of the above
15. Tutoring (mentoring) is important to the success of my child (children) succeeding in Grades K to Grade 12

<table>
<thead>
<tr>
<th>Completely Disagree</th>
<th>Neutral</th>
<th>Completely Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

16. Has your child, or children dropped out of school?
   a. Yes
   b. No

If yes, answer question 17.

17. My child, or children dropped out because __________________________.

Please circle one of the below if your child or children returned to school after dropping out.

18. My child, or children dropped out, but returned to complete their dogwood certificate (Grade 12).

19. My child, or children have dropped out, but returned to complete their up-grading education in order to enter a trades program (carpentry, welding, plumbing, etc) or diploma/degree.

If no, answer question 20.

20. My child, or children have not dropped out because ________________________.

EDUCATION AND TRAINING - ADULTS

Please circle what BEST describes you.

21. What is the highest level of education completed or the highest degree you have received?
   a. Elementary school, year completed:__________
   b. High school diploma(Dogwood) or equivalent, year completed:
       __________
   c. Evergreen Completion Certificate: __________
   d. College Certificate/Diploma type: ___________ year completed:
      __________
e. Trades training, type:_______________________ year completed:
   ______________
f. Trades Apprentice, type:____________________ year completed:___
   __________
g. Trades Certificate (Red Seal), type:___________ year completed:
   __________
h. Bachelor degree, type:______________________ year completed:
   __________
i. Masters or PhD degree, type:_______________ year completed:
   __________
j. Other __________________, type: _____________ year completed:
   __________

22. If in retirement age, go to question 26.

What type of training/education would you like to take?

a. Employment readiness (resume writing; foodsafe; First Aid; etc.)
b. Adult Dogwood
c. College Certificate/Diploma (eg. Professional Cook, Early Childhood Educator, Social Service Worker, Business Administration, etc.)
d. Trades Training (eg. Plumbing, Electrical, Pipefitting, Carpentry, etc.)
e. Trades Apprentice (Red Seal Program)
f. Bachelor’s Degree
g. Master’s Degree
h. Doctorate Degree
i. Other_______________
j. I’m not interested

23. What type of industry would you like to work in?

a. Natural resource consulting (forestry; fisheries; environmental)
b. Industry (Oil and Gas; Mining)
c. Government
d. Health Services
e. Business
f. Teaching/Education
g. Retail
h. Food/Hospitality
i. Technology
j. Other _______________
24. Some jobs are expected to be in high demand. If you are interested in these jobs, please circle up to 5 that interest you.
   a. Construction Trades Helpers and Labourers
   b. Steamfitters and Pipefitters
   c. Welders
   d. Concrete Finishers
   e. Truck Drivers
   f. Carpenters
   g. Heavy Equipment Operators
   h. Scaffolding
   i. Gasfitters
   j. Purchasing Agents and Officers
   k. Crane Operators
   l. Health Care Assistant
   m. Office Administration
   n. Teachers
   o. Education Assistant
   p. Physicians
   q. Registered Nurse
   r. Dental Hygienists
   s. Law Enforcement
   t. Computer Applications Software Engineer
   u. Civil Engineer
   v. Power Engineer
   w. Early Childhood Educators
   x. Accountants
   y. Environmental Monitors
   z. Biologist
   aa. Fish & Wildlife
   bb. Mariner Training (captain on boats)
   cc. Shipper/Receiver
   dd. Other
   ee. None of the above

25. If there was training/education available outside your community, you would be willing to take the training/education if,
   a. The training/education was less than one month
b. The training/education was less than six months and I came home once or twice during this time

c. The training/education was more than six months, but less than 2 years, and I came home a few times during this time

d. The training/education was more than 2 years and I came home on holidays during this time

e. I would take training/education anyway if is going to help me to get a better job

f. I would not take training/education if it were away from my community.

g. I would not take any further training

26. Do you have a Valid Driver’s License?
   a. Yes
   b. No

   Please choose your level of agreement with the following statements:

27. You are satisfied with the level of education and training you have

<table>
<thead>
<tr>
<th>Completely Disagree</th>
<th>Neutral</th>
<th>Completely Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

28. The education and training is available if you wish to take it

<table>
<thead>
<tr>
<th>Completely Disagree</th>
<th>Neutral</th>
<th>Completely Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

29. If training is unavailable locally, and the training you wish to take is available in another community, you would be willing to travel if ONLY your travel and accommodation expenses are covered.

<table>
<thead>
<tr>
<th>Completely Disagree</th>
<th>Neutral</th>
<th>Completely Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>
EMPLOYMENT/BUSINESS STATUS AND OPPORTUNITIES

Please circle ONLY ONE answer that BEST describe your current situation

30. Which of the following categories best describes your employment status?
   a. Full time permanent
   b. Part time permanent
   c. Full time temporary
   d. Part time temporary
   e. Seasonal (fall, winters or summers only)
   f. Casual (Occasionally)
   g. Not employed, looking for work
   h. Not employed, NOT looking for work
   i. Not employed, in school part time
   j. Not employed, in school full time
   k. Retired
   l. Disabled, not able to work

31. If you work, what is your position at work?
   a. Manager/Assistant Manager/Senior staff
   b. Intermediate staff
   c. Junior staff
   d. Independent contractor/consultant
   e. Commercial fisher
   f. Tradesperson
   g. Other __________________________
   h. Not currently employed out of the home

32. If you work, does the position you have match with what you were trained/educated for?
   a. Yes
   b. No
   c. Not currently employed out of the home

33. How long have you worked there?
   a. 1 year or less
   b. More than 1 year and less than 5 years
   c. More than 5 year and less than 10 years
   d. More than 10 years and less than 20 years
   e. 20 years or more
f. Not currently employed out of the home

34. Have you, or how many times have you changed careers?
   a. 0
   b. 1
   c. 2
   d. 3
   e. 4 or more

Please choose your level of agreement with the following statements:

35. I would like to start my own business.

36. You would start your own business if you had financial assistance.

37. You would start your own business if you had access to training on how to successfully start and operate a business.

38. You feel you have the skills to start and operate your own business.

39. If you were able to set up your own business, what would it be?

MOBILITY QUESTIONS
40. You would be willing to move from your community for permanent work if it was within the Region you are currently living (Northern BC., Lower Mainland; Alberta; etc.)

[Scale: Completely Disagree (0) to Completely Agree (10)]

41. You would be willing to move from your community for permanent work if it was within Northern BC

[Scale: Completely Disagree (0) to Completely Agree (10)]

42. You would be willing to move from your community for permanent work if it was within Canada

[Scale: Completely Disagree (0) to Completely Agree (10)]

43. I want to stay in this community for the rest of my life.

[Scale: Completely Disagree (0) to Completely Agree (10)]

44. I would like to see my kids (or if I was to have kids) grow up in this community

[Scale: Completely Disagree (0) to Completely Agree (10)]

45. I would take employment that requires me to be away from home for several weeks at a time

[Scale: Completely Disagree (0) to Completely Agree (10)]
46. If a Company offered me and my spouse/children an affordable new house and job in another community 1000 km from here, you would not accept the offer.
Appendix A2: Survey Questionnaire No. 2. Kitsumkalum Indian Band

GENERAL QUESTIONS

Please circle ONLY ONE answer that BEST describe your current situation.

1. Do you have formal First Nations status in British Columbia?
   a. Yes
   b. No

2. How old are you?
   a. 18 to 25
   b. 26 to 30
   c. 31 to 40
   d. 41 to 50
   e. 51 to 60
   f. Over 60

3. Are you male or female?
   a. Male
   b. Female

4. What is your marital status?
   a. Single
   b. Divorced or separated
   c. Divorced or separated with dependants outside of the home
   d. Married or Common-Law

5. How many dependent children live in your household (18 or under)?
   a. None
   b. 1
   c. 2
   d. 3
   e. 4 or more

6. How many adults (over 18) live with you?
   a. None
   b. 1
   c. 2
d. 3
  e. 4 or more

7. How many adults living with you are not employed and are on social assistance?
   a. None
   b. 1
   c. 2
   d. 3 or more

HOUSING

Please circle ONLY ONE answer that BEST describe your current situation.

8. Where do you currently live?
   a. Kitsumkalum Village
   b. City of Terrace
   c. Prince Rupert
   d. Other _____________

9. How long have you lived within the above noted community?
   a. Less than 1 year
   b. More than 1 year and less than 5 years
   c. More than 5 years and less than 10 years
   d. Over 10 years

10. Do you
    a. Rent an apartment/house from a landlord
    b. Rent an apartment/house from the Band Council
    c. Rent to own from a landlord
    d. Rent to own from the Band Council
    e. Own an apartment/house
    f. Stay with a family member/friend
    g. Other__________________

11. If you rent, how much is your total rent per month? (Include the total amount, not the amount you pay if you share the rent)
    a. Less than $500
    b. $500 - $1000
    c. $1001 - $1500
    d. $1501 - $2000
e. $2001 or more
f. I don’t pay rent

12. If you own an apartment or house, how much do you owe on your mortgage?
   a. Under $50,000
   b. Between $50,001 and $100,000
   c. Between $100,001 and $150,000
   d. Between $150,001 and $200,000
   e. Between $200,001 and $250,000
   f. Between $250,001 and $300,000
   g. Over $300,000
   h. I have a Certificate of Possession
   i. I don’t own an apartment or house

Please choose your level of agreement with the following statements:

13. You can afford your current living accommodation with no financial problems.

14. You are currently living in your desired location (e.g. No transportation problems)

15. Your home has adequate space for your family/everyone living there.

16. The home you live in is in good condition; there is no mould and no major repairs needed.
HEALTH

Please choose your level of agreement with the following statements.

17. You and the people you live with have no problem in accessing primary health care (non-emergency services).

18. The time for you or someone in your household to wait to see a family doctor for non-emergency issues is reasonable.

19. The time for you or someone in your household to wait to see a specialist doctor is reasonable.

20. If you or someone in your household needs to go to Town to see a Doctor for a non-emergency, there is no problem with transportation.

21. You feel access to emergency services in your community is adequate.
EDUCATION/TRAINING

Please circle ONLY ONE answer that BEST describes your current situation.

22. What is the highest level of education completed or the highest degree you have received?
   a. Elementary school, year completed: __________
   b. High school Diploma or equivalent (Dogwood), year completed: __________
   c. Evergreen Completion Certificate: year completed: __________
   d. College Certificate/Diploma type: ___________ year completed: __________
   e. Trades training, type: __________________ year completed: __________
   f. Trades Apprentice, type: __________________ year completed: __________
   g. Trades Certificate (Red Seal), type: __________ year completed: __________
   h. Bachelor degree, type: __________________ year completed: __________
   i. Masters or PhD degree, type: ___________ year completed: __________
   j. Other __________________, type: ___________ year completed: __________

23. What type of further training/education would you like to take?
   a. Employment readiness (resume writing; foodsafe; First Aid; etc.)
   b. High school
   c. College Certificate/Diploma (eg. Professional Cook, Early Childhood Educator, Social Service Worker, Business Administration, etc.)
   d. Trades Training (eg. Plumbing, Electrical, Pipefitting, Carpentry, etc.)
   e. Trades Apprentice (Red Seal Program)
   f. Bachelor’s Degree
   g. Master’s Degree
   h. Doctorate Degree
   i. Other _______________
   j. I’m not interested
24. What type of industry would you like to work in?
   a. Natural resource consulting (forestry; fisheries; environmental)
   b. Industry (Oil and Gas; Mining)
   c. Government
   d. Health Services
   e. Business
   f. Teaching
   g. Retail
   h. Food/Hospitality
   i. Technology
   j. Other _______________
   k. None of the above

25. Some jobs are expected to be in high demand. If you are interested in these jobs, please circle ONLY THE ONE THAT YOU ARE MOST INTERESTED IN.
   a. Construction Trades Helpers and Labourers
   b. Steamfitters and Pipefitters
   c. Welders
   d. Concrete Finishers
   e. Truck Drivers
   f. Carpenters
   g. Heavy Equipment Operators
   h. Scaffolding
   i. Gasfitters
   j. Office Administration
   k. Purchasing Agents and Officers
   l. Crane Operators
   m. Health Care Assistant
   n. Teachers
   o. Education Assistant
   p. Physicians
   q. Registered Nurse
   r. Dental Hygienists
   s. Law Enforcement
   t. Computer Applications Software Engineer
   u. Civil Engineer
   v. Power Engineer
   w. Early Childhood Educators
   x. Accountants
y. Mariner (captain on boats)
z. Environmental Monitors
aa. Biologist
bb. Fish & Wildlife
cc. Shipper/Receiver
dd. Other ______________
e. None of the above

26. If there was training/education available outside your community, you would be willing to take the training/education if,
   a. The training/education was less than one month
   b. The training/education was less than six months and I came home once or twice during this time
   c. The training/education was more than six months, but less than 2 years, and I came home a few times during this time
   d. The training/education was more than 2 years and I came home on holidays during this time
   e. I would take training/education anyway if is going to help me to get a better job
   f. I would not take training/education if it were away from my community.
   g. I would not take further training.

Please choose your level of agreement with the following statements:

27. You are satisfied with the level of education and training you currently have

<table>
<thead>
<tr>
<th>Completely Disagree</th>
<th>Neutral</th>
<th>Completely Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>10</td>
</tr>
</tbody>
</table>

28. The education and training is currently available in the local region if you wish to take it.

<table>
<thead>
<tr>
<th>Completely Disagree</th>
<th>Neutral</th>
<th>Completely Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>10</td>
</tr>
</tbody>
</table>

29. If training is unavailable locally, and the training you wish to take is available in another community, you would be willing to travel if ONLY your travel and accommodation expenses are covered.
EMPLOYMENT/BUSINESS

Please circle ONLY ONE answer that BEST describe your current situation

30. Which of the following categories best describes your employment status?
   a. Full time permanent
   b. Part time permanent
   c. Full time temporary
   d. Part time temporary
   e. Seasonal (fall, winters or summers only)
   f. Casual (Occasionally)
   g. Not employed, looking for work
   h. Not employed, NOT looking for work
   i. Retired
   j. Disabled, not able to work

31. If you work, what is your position at work?
   a. Manager/Assistant Manager/Senior staff
   b. Intermediate staff
   c. Junior staff
   d. Independent contractor/consultant
   e. Commercial fisher
   f. Tradesperson
   g. Other __________________________
   h. Not currently employed out of the home

32. If you work, does the position you have match with what you were trained/educated for?
   a. Yes
   b. No
   c. Not currently employed out of the home

33. How long have you worked there?
   a. 1 year or less
   b. More than 1 year and less than 5 years
   c. More than 5 year and less than 10 years
d. More than 10 years and less than 20 years

e. 20 years or more

f. Not currently employed out of the home

34. How many times have you changed careers?
   a. 0
   b. 1
   c. 2
   d. 3
   e. 4 or more

35. What is your current gross salary before taxes per year? (If you are Married or Common-Law, please refer to the sum of both salaries)
   a. Under $10,000
   b. Between $10,001 and $20,000
   c. Between $20,001 and $30,000
   d. Between $30,001 and $40,000
   e. Between $40,001 and $50,000
   f. Between $50,001 and $60,000
   g. Between $60,001 and $70,000
   h. Over $70,001
   i. No current salary

Please choose your level of agreement with the following statements:

36. You would like to start your own business.

37. You would start your own business if you had financial assistance.
38. You would start your own business if you had access to training on how to successfully start and operate a business.

39. You believe you currently have the skills to start and operate your own business.

40. If you were able to set up your own business, what would it be?

POTENTIAL BARRIERS TO TRAINING, EDUCATION, EMPLOYMENT AND BUSINESS DEVELOPMENT

Please circle the answer that BEST describes your current situation.

41. Do you feel you have a barrier(s) to obtaining full time permanent work, and if so, what is it or are they? If more than one, please rank them (1, 2, 3..) based on importance by placing a number beside the option.
   a. Not enough jobs available
   b. Illness or disability (physical and mental health)
   c. Difficulty with reading and writing
   d. Need more training/education
   e. Lack of confidence/self esteem
   f. No driver’s license
   g. Other transportation issue________________
   h. No one to care of children while I am at work
   i. No one to care of elders while I am at work
   j. Other:___________________________
   k. I don’t feel any barriers

42. Do you have any mental health/addiction issues? Please rank them in importance by placing a number beside each one, if more than one is chosen.
   a. Anxiety
   b. Depression
   c. Schizophrenia; bi-polar
d. Drug addiction
e. Alcohol addiction
f. Gambling addiction
g. Other ___________
h. None of the above

Please choose your level of agreement with the following statements:

43. You would take more education and training if you had a tutor or mentor to help with assignments/understanding.

44. You have NOT experienced racism while undergoing training, education, or in the workplace

Mobility Questions

45. You would be willing to move from your community for permanent work if it was within your current region

46. You would be willing to move from your community for permanent work if it was within Northern BC
47. You would be willing to move from your community for permanent work if it was within Canada

48. I do not want to move outside of my community for permanent work.

49. I would like to see my kids (or if I was to have kids) grow up in this community

50. I would take employment that requires me to be away from home for several weeks at a time

51. If a Company offered me and my spouse/children an affordable new house and job in another community 1000 km from here, I would not accept the offer

CURRENT USE OF TRADITIONAL FOODS AND MATERIALS

Please circle the answer that BEST describes your current situation.

From the Ocean

52. I am able to access traditional foods and traditional use materials from the ocean because I know what areas Kitsumkalum Members have rights to harvest (both common areas and specific Kitsumkalum rights areas)
53. I am able to access traditional foods from the ocean, such as salmon, halibut, and seaweed because I have the means (boat, friends who have a boat, and gear) to do so.

54. I am able to access traditional foods from the ocean because someone (relative or friend) provides them to me.

55. I am able to access traditional foods from the ocean because the community commercial by provides them to me.

56. I am able to access traditional use materials for making traditional use items (baskets, tools, etc.) from the ocean because I have the means (boat, gear, etc.) to do so.

57. I am able to access traditional use materials from the ocean because someone (relative or friend) provides them to me.
Land and Streams/rivers/Lakes (hunting/fishing/trapping/berries)

58. I am able to access traditional foods from the land and streams/rivers/lakes (not the ocean) because I have the means (vehicle, hunting gear, etc.) to do so

59. I am able to access traditional foods from the land and streams/rivers/lakes because someone (relative or friend) provides them to me

60. I am able to access traditional use materials from the land and streams/rivers/lakes (not the ocean) because I have the means (vehicle, hunting gear, etc.) to do so

61. I am able to access traditional use materials from the land and streams/rivers/lakes (not the ocean) because someone (relative or friend) provides them to me

62. I am able to access traditional foods and traditional use materials from the land and streams/rivers/lakes because I know what areas Kitsumkalum Members have rights to harvest (both common areas and specific Kitsumkalum rights areas)

63. Over the past 10 years, I have had no problems with other First Nations occupying my family’s fishing grounds.
Over the past 10 years, I have had no problems with Non First Nations occupying my family’s fishing grounds.
Appendix B: Key Informant Interview Questions.

THESIS STUDY INFORMATION AND QUESTIONS PROVIDED IN ADVANCE OF INTERVIEWS

AUGUST 20, 2015

Introduction:

Interviews have been scheduled to help answer the Thesis Question: Can Liquid Natural Gas and Pipeline projects in Northwestern British Columbia contribute to local social and economic sustainability in First Nations Communities? You have been provided with this brief description of the study along with the questions to be asked during the interview because you have been contacted by telephone and are considering participating in the study. If you agree to participate, please sign the consent form and return to debra.m.stokes@gmail.com.

The purpose of the interviews is to gain an understanding of what government, industry and First Nation (FN) Band employees know, do and think about current issues facing Northwestern British Columbia (NWBC) aboriginal peoples in terms of: training/education, employment and contracting opportunities; access to healthcare and affordable housing; whether people are mobile; and if racism is present in the workplace, all in the context of the Liquid Natural Gas (LNG) industry coming to the Northwest and contributing to more sustainable resilient FN communities. Mining companies will also be interviewed from outside the Kitimat/Prince Rupert area to obtain a perspective on their approach to the contribution they make to sustainable communities. The interview will be between 30 and 45 minutes long. Written notes will be taken by the interviewer, and if consent is given, the interview will also be audio recorded.

The study will investigate what is currently being planned and implemented by government and the LNG/pipeline and mining industries to contribute to financial and economic sustainable FN communities, specifically beyond the construction phase of the LNG developments and closure phase of mines. The study focusses on FNs as vulnerable populations to boom and bust dynamics. Effects to vulnerable people, if managed well, I believe, can be mitigated, and benefits from developments can be maximized. As an environmental consultant/manager for several years, one of my personal professional goals has been to develop plans to be or contribute to sustainability. The environmental aspect of sustainability has been challenging, but there are now many ways to address environmental issues associated with the extractives industries. Contributing to financial and economic sustainable communities however, is more challenging to address. In an effort to learn more about how to contribute to the sustainability of FN communities, I am currently conducting a Thesis study through the Mining Department at UBC. I thought you would be a good person to interview to gain some insight into what planning initiatives and programs are taking place in the area where you work, what initiatives you are involved in, and if you have some ideas of additional work that could be done to help FN communities be more sustainable in the long-term. If your consent is given to conduct the interview, the following questions will be asked.
Questions:

What do you know about current issues aboriginal people are facing in NWBC, with respect to training/education and long term employment/contracting opportunities? Do you know what kinds of barriers exist for aboriginal people and how these barriers can impact their ability to move forward with their lives?

What are you involved in or know about in your work regarding FNs planning and programs to improve the overall standard of living for FNs and create more sustainable resilient First Nation communities?

What more do you think could be done to address issues facing aboriginal people in NWBC to improve individual FNs overall standard of living and move communities to become more sustainable and resilient?

Thank you very much for your attention. As described in the enclosed Consent Form, the source of information provided during the interview process will be kept confidential. However, please note the views of each sector (LNG/Pipeline; mining; governments; and First Nations) will be provided in the final study.