

**Community benefit agreements and impact
assessment: Exploring methods and opportunities to
improve natural resource development outcomes**

**by
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Abstract

This thesis focuses on analyzing and evaluating two integral policy mechanisms related to natural resource governance in Canada: community benefit agreements (CBAs) and impact assessment (IA). The purpose of this thesis is to address critical research needs concerning these two mechanisms that include exploring their role in natural resource governance, identifying their deficiencies, and identifying opportunities and methods that can contribute to improving natural resource development outcomes for affected parties. In Chapter 2, I conduct a systematic literature review and a thematic content analysis to identify the strengths, weaknesses, and role of CBAs. The results of the literature review and coding analysis help identify two overarching characterizations of CBAs present within the literature, 1) CBAs as instruments that reinforce and legitimize the status quo of natural resource governance and 2) CBAs as instruments that facilitate sustainable community development, as well as themes within these characterizations that provide more specificity as to the role of CBAs. In Chapter 3, I evaluate the strengths and weaknesses of alternative methods for assessing whether proposed projects are in the public interest. I propose a new evaluative framework, referred to as the “Public Interest Multiple Account Evaluation Framework,” as a tool that can help inform decision making in IA. The framework is evaluated by IA experts using a survey, the results of which indicate that it has the potential to better inform public interest determinations in IA and overcome many of the limitations associated with the impact estimation methods that are currently used in IA. In Chapter 4, I conduct a case study to analyze the cost of a CBA for a project developer, focusing on the Mary River Inuit Impact and Benefit Agreement. The findings of this case study indicate that the CBA has a relatively low cost compared to the mine’s total cash costs and to a hypothetical cost of conflict. The research presented in this thesis represents a significant contribution to CBA and IA literature and has important practical implications that can help improve CBA and IA outcomes for Indigenous communities, project developers, senior levels of government, and society as a whole.

Keywords: Community benefit agreement; impact assessment; multiple account evaluation; Mary River Mine; natural resource governance

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List of Acronyms

BCA	Benefit-cost analysis
CAD	Canadian dollars
CBA	Community benefit agreement
CCSI	Columbia Centre for Sustainable Investment
CIRDI	Canadian International Resources and Development Institute
CIT	Corporate income tax
CSR	Corporate social responsibility
DCFA	Discounted cash flow analysis
EconIA	Economic impact analysis
ERP	Early revenue phase
FIFO	Fly-in fly-out
FPIC	Free, prior, and informed consent
FTE	Full-time equivalent
GBA Plus	Gender-based analysis plus
GDP	Gross domestic product
GHG	Greenhouse gas
IA	Impact assessment
IAAC	Impact Assessment Agency of Canada
IIBA	Inuit Impact and Benefit Agreement
IRR	Internal rate of return
MAE	Multiple account evaluation
MTA	Million tonnes per annum
NIRB	Nunavut Impact and Review Board
NLCA	Nunavut Land Claim Agreement
NPV	Net present value
PY	Person years of employment
QIA	Qikiqtani Inuit Association
SLO	Social license to operate
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples

Chapter 1. Introduction

Extraction of non-renewable natural resources makes a significant contribution to the Canadian economy. In 2022, non-renewable natural resource industries contributed approximately \$154 billion (2012 CAD) to Canada's GDP, accounting for approximately 7.5% of total GDP (Statistics Canada, 2023). New oil, natural gas, and mining projects are proposed every year, with private proponents and governments citing an abundance of benefits in the form of new employment opportunities and tax and royalty revenues (T. Gunton, 2017; Hayter & Patchell, 2016; Ryser et al., 2019). The colonial origins and modern manifestations of Canada's natural resource governance arrangements, however, have largely excluded meaningful Indigenous involvement in decision making and from the receipt of benefits from natural resource development (Bocoum et al., 2012; Cueva, 2017; Dupuy, 2017; Hira & Busumtwi-Sam, 2018; Shanks & Lopes, 2006). Additionally, policy mechanisms relied upon to assess the impacts of proposed projects in Canada suffer from deficiencies that hinder their ability to determine whether projects are designed to maximize benefits and minimize and mitigate adverse impacts (Fonseca & Gibson, 2021; Joseph, Gunton, & Hoffele, 2020; Joseph, Gunton, Knowler, et al., 2020; Retief et al., 2013; Williams, 2019). While extractive natural resource projects have the ability to generate significant benefits for private project developers, Indigenous groups, senior levels of government, and society as a whole, it can be challenging to accurately predict the consequences of these projects prior to development and ensure that benefits are equitably distributed.

This thesis focuses on analyzing and evaluating two policy mechanisms related to natural resource governance in Canada: community benefit agreements (CBAs), also referred to as impact and benefit agreements, and impact assessment (IA), also referred to as environmental impact assessment. CBAs exist outside of a regulatory framework and are primarily negotiated between private project developers and Indigenous communities. IA, on the other hand, is a relatively well established, though complex, process that is required for all major projects in Canada. These two mechanisms are integral components of the current natural resource governance framework in Canada, both in terms of informing decision making around major natural resource project approval and in terms of ensuring that the benefits and costs of projects are accurately estimated and equitably distributed.

1.1. Community Benefit Agreements

CBAs are legally binding bilateral agreements that communities negotiate with private project developers and senior levels of government. While CBAs can be negotiated by non-Indigenous communities and can also be negotiated with senior levels of government, the focus of this research is on CBAs negotiated between Indigenous communities and private project developers for major natural resource projects. CBAs are not obligatory for all provinces and territories in Canada, but it has become common practice for project developers, governments, and communities to pursue CBA negotiations. As of October 2023, over 430 CBAs have been negotiated in Canada in the mining sector alone (Natural Resources Canada, 2023).

Theoretically, CBAs have the ability to build mutually beneficial arrangements by making proposed projects incentive compatible for both Indigenous communities and project developers (Dorobantu & Odziemkowska, 2017; MacPhail et al., 2023). Indigenous communities often receive benefits from CBAs in the form of revenue (Adebayo & Werker, 2021; Agbaitoro, 2018; Alcantara & Morden, 2019; Bocoum et al., 2012), employment and training opportunities (Adebayo & Werker, 2021; Agbaitoro, 2018; Fidler & Hitch, 2007; V. Gibson, 2008; O’Faircheallaigh, 2006), contracting opportunities for local businesses (Adebayo & Werker, 2021; O’Faircheallaigh, 2010a; Shanks & Lopes, 2006; Wanvik, 2016), new community infrastructure (Agbaitoro, 2018; Cameron & Levitan, 2014; Glasson, 2017; O’Faircheallaigh, 2006), and impact mitigation measures (Craik et al., 2017; Fitzpatrick, 2007; Kielland, 2015; O’Faircheallaigh, 2010b, 2017). Project developers also stand to benefit from negotiating CBAs by reducing the risk of conflict and increasing the likelihood of project approval (Caine & Krogman, 2010; Cameron & Levitan, 2014; Grégoire, 2013). Negotiating a CBA, however, does not guarantee that all parties will benefit from a project. CBAs have been criticized for perpetuating unequal power dynamics surrounding natural resource governance (Agbaitoro, 2018; Alcantara & Morden, 2019; Caine & Krogman, 2010; Fidler & Hitch, 2007; Hira & Busumtwi-Sam, 2018; Howard-Wagner, 2010), enabling senior levels of government to abdicate their responsibilities to provide services to rural communities (Fidler, 2008; Heisler & Markey, 2013; Hummel, 2019; Levitan, 2013; Peterson St-Laurent & Le Billon, 2015; Scott, 2020), creating conflict within and between communities (G. Gibson & Klinck, 2005; Graben et al., 2019; Horowitz et al., 2018;

Keenan et al., 2016; Keenan & Kemp, 2014; Kuokkanen, 2011), and undermining the role of regulatory mechanisms (including IA) (Cameron & Levitan, 2014; Grégoire, 2013; Klein et al., 2004; Noble & Birk, 2011). Additionally, in practice, CBA outcomes for Indigenous communities can vary, and the extent to which they benefit communities depends on a community's bargaining power (Arenas et al., 2020; O'Faircheallaigh, 2016, 2021; Salmon, 2023).

1.2. Impact Assessment

The IA process is designed to identify the positive and adverse consequences of a proposed project, mitigate potential adverse impacts, and ultimately determine whether a proposed project is in the public interest and, consequently, whether it should be approved or rejected (Impact Assessment Agency of Canada, 2021; International Association for Impact Assessment, 2009; International Association for Impact Assessment and Institute of Environmental Assessment, 1999). All major proposed projects that meet a certain threshold are required to undergo an IA in Canada and proponents must obtain an IA certificate, along with various licenses and permits, in order to develop a project (Impact Assessment Agency of Canada, 2021). Depending on the size and sector of a proposed project, it may go through a provincial/territorial process, federal process, or both (Impact Assessment Agency of Canada, 2021). IA in Canada is proponent-led, meaning that project proponents, with guidance from the Impact Assessment Agency of Canada or the relevant provincial/territorial agency, are responsible for collecting much of the information that is used to assess the impacts of the proposed project (Impact Assessment Agency of Canada, 2021). This information is then reviewed and evaluated by the relevant IA agency and various groups including expert intervenors, government agencies, Indigenous groups, and the public (Impact Assessment Agency of Canada, 2021). Finally, a cabinet minister or Governor in Council must review all the information generated in the IA process and determine whether the proposed project is in the public interest and, consequently, whether to approve or reject the project (Impact Assessment Agency of Canada, 2021).

IA has a number of deficiencies that affect its ability to inform decision makers on the impacts of a proposed major project. One of these is that the methods relied upon to estimate the positive and adverse consequences of a project are often inadequate and make it challenging to accurately and transparently assess whether a project is in the

public interest (Fonseca & Gibson, 2021; Retief et al., 2013; Williams, 2019). Determining whether a proposed project is in the public interest¹ is a fundamental step in Canada's IA process and public interest determinations often directly influence whether a proposed project is approved or rejected (Impact Assessment Agency of Canada, 2020a; Joseph, Gunton, & Hoffele, 2020; Joseph, Gunton, Knowler, et al., 2020). IA often uses qualitative impact characterizations to indicate the severity of impacts (e.g., low, medium, or high) and the characteristics of impacts (e.g., magnitude, geographic extent, timing, frequency, and duration) that make it challenging to compare the trade-offs of a proposed project (Fonseca & Gibson, 2021; Joseph, Gunton, & Hoffele, 2020; Joseph, Gunton, Knowler, et al., 2020; Retief et al., 2013; Williams, 2019). Also, IA often uses a method known as economic impact analysis to estimate the economic consequences of a project, but this method is prone to overestimating benefits and has a limited ability to analyze the distribution of impacts, both in spatial terms and amongst the various parties affected by a project (Crompton, 2006; Joseph, Gunton, Knowler, et al., 2020; Williams, 2016, 2019). IA's limited ability to compare trade-offs and to assess the distribution of benefits and costs has considerable implications for the communities located near proposed projects, especially Indigenous communities, as these communities often experience a relatively high share of the adverse impacts and a relatively low share of the benefits as compared to project developers, senior levels of government, and other stakeholders (Fidler & Hitch, 2007; Howlett et al., 2011; Söderholm & Svahn, 2015). Consequently, due to the deficiencies of IA, accurately assessing the potential impacts imposed on these local communities is challenging.

1.3. Gaps in CBA and IA literature

CBAs and IA have received considerable academic attention, but there are still critical research gaps that need to be addressed. First, there is a lack of consensus in the literature as to how successful CBAs are in addressing the issues of natural resource development. Given the prevalence of CBAs, it is clear that they help facilitate the

¹ The term "public interest" is not explicitly defined in Canadian IA policy. The Impact Assessment Act, however, outlines five factors that decision makers must consider when making a public interest determination including the extent to which the project contributes to sustainability, the extent to which the impacts of the project are significant, the implementation of mitigation measures, the impacts that the project may have on Indigenous groups and the rights and title of Indigenous peoples, and the extent to which the project contributes to environmental obligations and climate change commitments (Impact Assessment Agency of Canada, 2020a).

development of new resource projects, but it is unclear whether they are ultimately generating benefits for the Indigenous communities that negotiate them. Second, there are few CBA-focused literature reviews and no study to date has conducted a comprehensive literature review that focuses on the role of CBAs in natural resource governance. Third, there is a need for research that focuses on project developers and how they are affected by CBAs. In order to gain a broader understanding of CBAs, it is important to identify and analyze the factors that influence project developers' decisions when negotiating CBAs, as these factors have clear implications for the potential benefits received by Indigenous communities. The cost of a CBA for a project developer and the impact of a CBA on the economic viability of a project are significant factors that inevitably influence CBA negotiations, but no study to date has attempted to estimate a project developer's costs associated with negotiating a CBA. Fourth, concerning IA, there is a need for studies that evaluate alternative methods for analyzing proposed projects to help inform decision makers determine whether projects are in the public interest. Various methods are capable of estimating the impacts of a proposed project and contributing to determining whether projects are in the public interest, and consequently whether they should be approved or rejected, including qualitative impact characterization, economic impact analysis, benefit-cost analysis, sustainability assessment, and multiple account evaluation (T. Gunton et al., 2020). There is a need for studies that compare these alternative methods and evaluate them based on their ability to inform public interest determinations in IA. Fifth, there is a need for studies that develop and propose comprehensive, pragmatic solutions to overcome the deficiencies of the methods currently used to inform decision making in IA. While IA has improved over time to better assess and mitigate adverse impacts of major projects, it still suffers from deficiencies that hinder its ability to accurately and transparently inform decision makers on the consequences of a proposed project. The purpose of this thesis is to address these key research gaps relating to CBAs and IA and contribute to the improvement of CBA and IA outcomes for Indigenous communities, private project developers, senior levels of government, and society as a whole.

1.4. Research Overview

This research seeks to explore the role of IA and CBAs in resource governance, identify research gaps and practical deficiencies of these two mechanisms, and identify

opportunities and methods that can contribute to improving resource development outcomes for all affected parties. The research also seeks to inform and advance the broader literature related to resource governance. The objectives of this research are to examine the strengths, weaknesses, and role of CBAs based on a review of the literature, to develop a new comprehensive multiple account evaluation framework designed to better inform decision making in IA, and to estimate the cost of a CBA for a private project developer. These three overarching objectives are explored in separate chapters presented below.

1.5. Research Products and Contributions

The chapters in this thesis share overlapping themes but were produced as individual articles. In Chapter 2, I conduct a systematic literature review and a thematic content analysis using NVivo 12 to identify the strengths, weaknesses, and role of CBAs.² I examine how CBAs are characterized in academic literature to identify whether they reinforce and legitimize the status quo of natural resource governance, or whether they facilitate sustainable community development. This chapter fills an important research gap in that it is the first study to date to undertake this type of literature review and content analysis with a focus on the positive and negative aspects of CBAs. Additionally, I present a CBA analytical framework based on the results of the systematic literature review and thematic content analysis that fills a research gap by comprehensively outlining the strengths, weaknesses, and role of CBAs as described in the literature. The contribution of this CBA analytical framework is that it can be used to help identify opportunities to improve future CBAs and CBA outcomes.

In Chapter 3, I evaluate the strengths and weaknesses of alternative methods for assessing whether proposed projects are in the public interest.³ I then present a new multiple account evaluation (MAE) framework that is intended to help better inform decision making and public interest determinations in IA. In this chapter, I propose the “Public Interest MAE Framework” as a tool that overcomes numerous limitations associated with the impact estimation methods currently used in IA. I apply the Public

² A version of Chapter 2 was co-authored with Sean Markey and was published in *Resources Policy* in 2021.

³ A version of Chapter 3 was co-authored with Sean Markey and is currently under review.

Interest MAE Framework to a single demonstrative case study, the Mary River Iron Mine located on Baffin Island, Nunavut, Canada. I use a discounted cash flow model to estimate the impacts of the mine and the distribution of benefits and costs amongst the various parties affected by the mine. This analysis was conducted in 2021 when a proposed expansion was under consideration and the assumptions of the analysis reflect the information available at the time. Additionally, I conduct a survey with IA experts and practitioners to evaluate the Public Interest MAE Framework and identify opportunities to improve the framework. MAE is already an established method for assessing the potential impacts of proposed projects, but this is the first study to date to adapt MAE methodology directly to Canadian IA policy and thus a significant contribution to IA literature. In addition to informing decision makers, the Public Interest MAE Framework can be used as a standalone tool by communities participating in IA to assess how they will be affected by proposed projects and determine whether projects are in their interest. The framework can also be used to support the negotiation of CBAs.

In Chapter 4, I conduct a case study to analyze the cost of a CBA for a project developer.⁴ This study builds on the methodology used in the study presented in Chapter 3 in that I use a discounted cash flow model and use the same case study topic (the Mary River Iron Mine). The two studies, however, have different objectives. In the study presented in Chapter 4, I estimate the cost of the Mary River Inuit Impact and Benefit Agreement (IIBA) for the developer, Baffinland Iron Mines Corporation, and compare this cost relative to the economic viability of the project and to the cost of conflict. The case study analysis presented in Chapter 4 estimates the incremental cost of the IIBA by comparing scenarios with and without the IIBA whereas the case study analysis presented in Chapter 3 estimates the incremental impacts of the mine by comparing scenarios with and without the mine. Additionally, as part of this study I explore how alternative theories related to resource development influence a project developer's decision when offering a CBA to a community. Since the analysis presented in Chapter 4 was conducted in 2023, after the proposed expansion of the mine was rejected, this analysis relies on more recent price and production assumptions compared to the case study analysis presented in Chapter 3 and therefore the estimates presented in the two chapters do not completely align. The study presented in Chapter 4 fills a critical

⁴ A version of Chapter 4 was co-authored with Eric Werker, Mark Moore, and Sean Markey.

research gap in that it is one of a limited number of studies that focuses on how CBAs affect project developers and, notably, it is the first study to date to estimate the cost of a CBA for a private project developer.

1.6. Statement of Interdisciplinarity

For the purpose of fulfilling the Doctor of Philosophy requirements in the School of Resource and Environmental Management, this research must explore and integrate at least two of three interdisciplinary elements which include public policy and planning, environmental and ecological economics, and environmental science. My research integrates aspects of all three elements, but primarily focuses on public policy and planning and environmental and ecological economics. CBAs have a strong connection to public policy and planning as well as environmental and ecological economics. There appears to be a policy gap in that governments are not directly engaging communities in natural resource decision-making processes in a meaningful or equitable manner. CBAs negotiated between communities and project developers appear to contribute to filling this policy gap. Additionally, CBAs often contain provisions that have economic and environmental consequences. CBA provisions with financial implications—such as project revenues, fixed payments, and jobs for community members—directly affect community and regional economies. Environmental provisions—such as relocating certain components of the project or committing to implementing environmental offsetting programs—directly affect local environmental and ecological health. It is evident that the topic of CBAs is highly interdisciplinary, bridging environmental and ecological economics with public policy and planning.

IA is inherently connected to public policy and planning as well as environmental and ecological economics. As discussed, the IA process is designed to estimate the positive and adverse consequences of a proposed project, identify and mitigate adverse impacts, and ultimately decide whether to approve or reject the proposed project. This decision is directly influenced by a determination of whether the project is deemed to be in the public interest, a process which has clear connections to public policy and planning. Additionally, estimating the positive and adverse consequences includes estimating the economic impacts of the proposed project, which has a clear connection to environmental and ecological economics.

Chapter 2. The role of community benefit agreements in natural resource governance and community development: A systematic review of the literature

Abstract

Community benefit agreements (CBAs) negotiated between natural resource project developers and local communities have become common resource governance instruments that have significant economic, environmental, social, and cultural implications. Natural resource projects and associated processes are contentious and often result in conflict due to the adverse impacts, inequitable benefit distributions, and inequitable decision-making authority associated with resource development. Despite their prevalence, questions remain regarding their role and whether they are instruments that reinforce and legitimize the status quo of natural resource governance (i.e., which prioritize corporate and senior government control and economic interests) or whether they are instruments that facilitate sustainable community development (i.e., which are inclusive of a broader set of interests and values). In this study, we undertake a systematic review of CBA literature with the purpose of determining how successful CBAs are in addressing the issues associated with natural resource development projects. Additionally, we develop a CBA analytical framework that provides a synopsis of how CBAs are framed in the literature and insights into how CBAs can be improved to ensure that they meet the objectives of communities, senior levels of government, and project developers. The findings of the systematic review indicate that there is a lack of consensus regarding the role of CBAs. It is our hope that this synthesis will advance understanding of CBAs at the international level and help frame future research endeavors leading to improved CBA outcomes for all parties.

2.1. Introduction

Natural resource development is both common and controversial. New oil, natural gas, and mining projects are proposed every year, with proponents citing an abundance of benefits including job creation and revenue generation, while others point to potential adverse social and environmental impacts and inequities in the distribution of project

benefits (T. Gunton, 2017; Hayter & Patchell, 2016; Ryser et al., 2019). In theory, it is possible to ensure that affected populations are adequately compensated with economic benefits that offset adverse impacts (O’Faircheallaigh, 2016). In practice, however, there are significant issues associated with the development of natural resource projects that generate considerable conflict between project proponents, senior levels of government, and affected Indigenous and non-Indigenous communities (Galbraith et al., 2007; Gillingham et al., 2016; Söderholm & Svahn, 2015). Managing this conflict and ensuring that resource development projects are designed to mitigate adverse impacts and maximize community benefits are important priorities affecting the national economies and economic sustainability of Indigenous and non-Indigenous populations in resource regions.

Community benefit agreements (CBAs), which are sometimes referred to as impact and benefit agreements, have emerged as an increasingly common instrument to mitigate adverse project impacts, distribute project benefits, and help fulfill project developers’ and governments’ duties to meet requirements for free, prior, and informed consent (FPIC) by consulting and accommodating communities (Fidler & Hitch, 2007; Gogal et al., 2005; Nwapi, 2017; O’Faircheallaigh, 2016; Papillon & Rodon, 2017; Prno et al., 2010; Sosa & Keenan, 2001; World Bank, 2012). Provisions negotiated as part of a CBA generally cover a combination of the following: revenue sharing mechanisms, training and employment opportunities, local business contracts, local infrastructure development, adverse impact mitigation measures, decision-making authority, implementation measures, and impact monitoring programs (M. Browne & Robertson, 2009; G. Gibson & O’Faircheallaigh, 2010; Legislative Assembly of the Northwest Territories, 2019; O’Faircheallaigh, 2016; Otto, 2017; Resolve, 2015; Szoke-Burke et al., 2018; US Department of Energy, 2017). A CBA can be structured in different ways including a bilateral agreement with a project developer, a bilateral agreement with a senior level of government, or a multilateral agreement with government and the project developer (Otto, 2017; Papillon & Rodon, 2017). CBAs can also be negotiated in concert with regulatory processes such as impact assessment (IA), which historically has been perceived to incorporate inadequate consultation and accommodation processes from the perspective of communities and the courts (Galbraith et al., 2007; Peterson St-Laurent & Le Billon, 2015). CBAs are considered by some to be a proactive approach implemented by project developers to engage communities and obtain their consent

(Cascadden, 2018; Gogal et al., 2005; Mahanty & McDermott, 2013; Papillon & Rodon, 2017).

While CBAs are not widely obligatory globally, it has become increasingly common practice for project developers, senior levels of government, and communities to pursue CBA negotiations for new natural resource projects. The prevalence and global applicability of CBAs is illustrated by an online repository of CBAs developed by the Columbia Centre for Sustainable Investment (CCSI) and the Canadian International Resources and Development Institute (CIRDI), which includes 120 agreements spanning over 18 countries (CCSI & CIRDI, 2018). Since this repository only includes publicly accessible agreements negotiated before 2018, the total current number of CBAs is much higher. Due to the prevalence of CBAs as a natural resource governance instrument, it is important to take stock of what is known about CBAs, what key questions or concerns remain, and what additional research is needed to better understand CBAs and their role.

The study upon which this paper is based is guided by the following research question, *how successful are CBAs in addressing the issues associated with natural resource development projects* (i.e., are CBAs for natural resource projects beneficial or detrimental to the communities that choose to negotiate them)? A preliminary scoping literature review indicated that there is an array of perspectives regarding the purpose of CBAs and whether CBAs are appropriate instruments for achieving the objectives of communities, project developers, and senior levels of government. This preliminary work led to the core purpose of this paper, being to construct a comprehensive, systematic review of the CBA literature to explore how the role of CBAs has been framed in the literature, whether they are perceived as instruments that successfully address the potential negative issues associated with natural resource development projects, and, consequently, what the implications of these CBA frames are for understanding the role of CBAs in the political economy of natural resource development.

Other researchers have conducted comprehensive and useful literature reviews that have focused on various topics associated with CBAs (see Caine & Krogman, 2010; Howlett et al., 2011; Kanhai Aman & Bala-Miller, 2020; O’Faircheallaigh, 2013; Peterson St-Laurent & Billon, 2015). Our systematic review further contributes to CBA literature by incorporating recent CBA publications up to December 2020, incorporating a wide

selection of CBA publications (130 articles), focusing on how the core role of CBAs has been framed in literature, and developing a CBA analytical framework. It is our hope that conducting this systematic literature review, and developing a CBA analytical framework based on it, will enhance understanding of CBAs' role in resource development and how they are perceived by researchers, practitioners, stakeholders, rightsholders, and communities.

This process of assessment, synthesis, organization, and analysis will ideally aid in the evolution of CBA research. Practically, the CBA analytical framework provides a comprehensive synopsis of how CBAs are depicted in the literature as well as insights into how CBAs may be improved to ensure they are meeting the objectives of those that choose to negotiate them. Improving CBA designs and negotiation processes will, ideally, lead to more positive CBA outcomes and help to facilitate sustainable resource extraction and community development for rural communities and regions affected by resource development.

Communities that negotiate CBAs often consist of people connected through spatial or geographic proximity and located near a proposed natural resource project, who therefore have the potential to be directly affected by the project (O'Faircheallaigh, 2013). Communities, however, can also consist of people connected through shared interests or culture (O'Faircheallaigh, 2013). In Canada and Australia, CBAs for natural resource projects are primarily negotiated between Indigenous communities and project developers and/or senior levels of government (Natural Resources Canada, 2023)⁵. This is reflected in the systematic review, with a majority of the literature focusing on bilateral

⁵ While this paper includes a focus on how CBAs affect Indigenous communities (primarily in Canadian and Australian contexts), there are various aspects of CBAs that apply at a broader level to include non-Indigenous communities and even municipal governments. All CBAs are legally binding contracts that are designed to specify obligations for the parties that choose to negotiate them. Generally, most CBAs (Indigenous and non-Indigenous) will contain common provisions that address revenue sharing, jobs and training, adverse impact mitigation, and local infrastructure (Otto, 2017; US Department of Energy, 2017). Therefore, insights discussed in this study that relate to these general provisions and the general structure of CBAs and CBA processes (e.g., implementation, monitoring, and evaluation) are also applicable to CBAs negotiated by non-Indigenous communities. Where Indigenous community CBAs and non-Indigenous community CBAs primarily diverge is in the underlying rationale for negotiating CBAs. CBAs negotiated by Indigenous communities are largely motivated by issues of rights and title, resource sovereignty, self-determination, and protection of Indigenous interests (Fidler, 2008; O'Faircheallaigh, 2008; Papillon & Rodon, 2017; Peterson St-Laurent & Billon, 2015), that add nuance and complexity to CBAs.

agreements between Indigenous communities and private project developers in Canada and Australia. The literature examined in the systematic review, however, covers a variety of jurisdictions and we strive to reflect the broad applicability of CBAs by applying a global perspective in our analysis.

The paper begins with an outline of the methodology of this study, including a systematic review and thematic content analysis of CBA and related literatures using NVivo 12. Following this, we present the findings of the review and NVivo analysis. Subsequently, we discuss the CBA analytical framework in terms of its potential impact on the political economy of natural resource development and how it may inform policy. Finally, we present conclusions and identify future research needs.

2.2. Methodology

The first phase of this study's methodology (Figure 2.1) consisted of a systematic review focusing on literature that frames or characterizes the core role of CBAs. We examined two databases in the review including the Simon Fraser University library database and Google Scholar, with the review concluding in December 2020. The search included the phrases "benefit agreement", "community benefit agreement", "impact benefit agreement", "impact and benefit agreement", "benefit sharing agreement", "development agreement", "community development agreement", and "environmental agreement". The review was limited to literature published in English between 1998 and 2020 that was available online. We compiled peer-reviewed publications that contained any of the phrases discussed above in their abstracts, titles, or keywords. Also, these publications were then scanned for additional CBA literature, some of which was non peer-reviewed (e.g., reports, guides, etc.). A total of 240 articles were compiled in this first step. Next, we reviewed the articles to determine if the keywords identified in the first step were used in reference to agreements between project developers and communities for natural resource projects, rather than other forms of development such as urban infrastructure projects. This reduced the number of articles down to 161.

The second phase of this study's methodology consisted of a thematic coding analysis using NVivo 12. We coded and categorized data following a stage model of qualitative content analysis (Berg & Lune, 2017): manually matching articles to the appropriate frames and themes that were identified in the systematic review in multiple

rounds of coding. During the initial round of coding, only literature that made a determination regarding the role of CBAs or framed CBAs in some way (positively, negatively, or both) were coded, as these articles are pertinent to this study's purpose and research question regarding how successful CBAs are in addressing issues of natural resource development. This step reduced the number of articles to 130⁶. Literature that provided a limited description of CBAs or just simply mentioned CBAs was not coded in this step. The two primary frames identified in the preliminary scoping review and confirmed to be dominant frames in the first round of coding, focus on the role of CBAs from the perspective of communities, as either positive instruments that help facilitate sustainable community development or negative instruments that reinforce and legitimize the status quo of natural resource governance. In a second round of coding, we re-examined the articles and identified more specific analytic categories, which are referred to here as themes, and sorted the articles based on these themes. Articles that utilized both of the primary frames and/or utilized multiple themes in their analyses or depictions of CBAs were coded under multiple nodes during the analysis. In the third phase of this study's methodology, the results of the NVivo analysis were used to develop a CBA analytical framework consisting of the overarching CBA frames and specific CBA themes (Table 2.1). In the fourth phase, the results of the coding analysis were reviewed. We, the authors, first reviewed all the coding to ensure consistency and accuracy. Then, three additional researchers examined the results of the NVivo analysis and the CBA analytical framework in an effort to decrease subjectivity and further ensure consistency and accuracy. Discrepancies and differences of opinion were discussed among the research team and changes were made where appropriate.

⁶ A complete list of the literature included in the systematic review can be found here: <https://www.sfu.ca/rem/planning/research/iba.html>

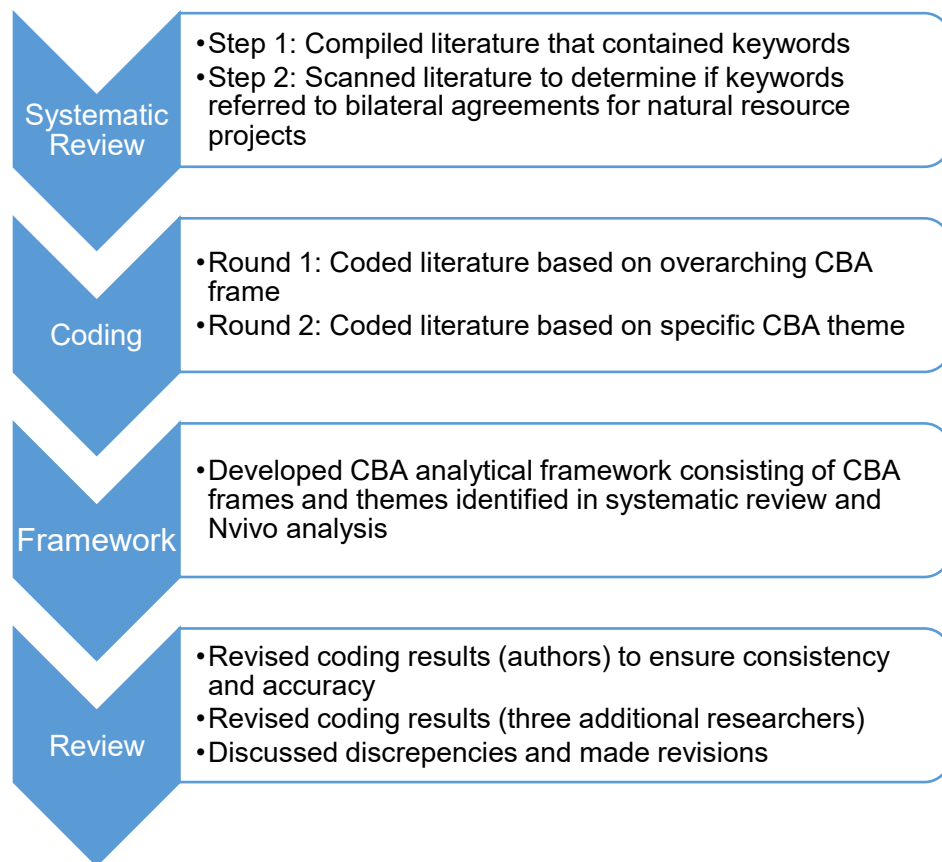


Figure 2.1. Methodology for systematic literature review and thematic coding analysis

2.3. Results

The results from the systematic review and coding analysis indicate that there are two primary, broad frames associated with the role of CBAs: one that views CBAs as negative instruments that reinforce and legitimize the potential negative features and governance structures of natural resource development; including adverse impacts, inequitable benefit distributions, and limited community involvement in decision making; and one that views CBAs as positive instruments that successfully leverage the positive dimensions and address the potential negative dimensions of natural resource development. Additionally, each frame is accompanied with its own set of themes. The two frames and twelve themes are summarized in Table 2.1.

The first overarching frame in the literature defines CBAs as *instruments that reinforce and legitimize the status quo of natural resource governance*, which appeared

in 72% of the articles reviewed. In this study, the status quo of natural resource governance refers to arrangements in which senior levels of government and/or private project developers maintain control over lands and natural resources, limiting communities' access to direct project benefits and burdening communities with adverse impacts (Bocoum et al., 2012; Cueva, 2017; Dupuy, 2017; Hira & Busumtwi-Sam, 2018; Shanks & Lopes, 2006). This is especially evident in colonial jurisdictions such as Canada and Australia, where colonial systems have maintained the subjugation and marginalization of communities by inhibiting control over territories and natural resources (Addison & Roe, 2018; Cameron & Levitan, 2014; Kuokkanen, 2011; Peterson St-Laurent & Billon, 2015). The CBA literature reviewed in this study asserts that the status quo of natural resource governance is maintained through CBAs perpetuating unequal power dynamics that heavily favour project developers and senior levels of government at the expense of Indigenous and local communities, enabling senior levels of government to abdicate some of their responsibilities, perpetuating injustices within and between communities, and undermining the role of other regulatory mechanisms.

The second overarching frame in the literature defines CBAs as *instruments that facilitate sustainable community development*, which appeared in 81% of the articles. This frame views CBAs in a positive manner due to their ability to contribute to the core components of sustainable community development including the economic, cultural, social, and environmental wellbeing of a community. Sustainable development, and best practices for achieving it, is a broad concept with various, sometimes competing, interpretations, which nevertheless serves as a useful umbrella term for our study (Connelly et al., 2013; Spiliotopoulou & Roseland, 2020). A simple and narrow interpretation of sustainable development is a development trajectory that allows for a jurisdiction to meet its current needs without negatively impacting the ability of future generations to meet their needs (Roseland, 2000; Spiliotopoulou & Roseland, 2020; Valente, 2012; World Commission on Environment and Development, 1987). Scaled down to the local level, sustainable community development refers to a systems-based approach in which communities exert control of their own development through implementing best practice sustainability principles and long-term planning to maximize their economic, social, cultural, and environmental wellbeing (Connelly et al., 2013; Halseth et al., 2018; Spiliotopoulou & Roseland, 2020; Valente, 2012).

No universal set of instructions exists for achieving sustainable community development, as it is highly context dependent and contingent on the objectives held by the individual community. This is especially important for Indigenous communities, for whom the principle of self-determination plays an enormous role in achieving sustainable community development (Boron & Markey, 2020; Corntassel, 2012; Corntassel & Bryce, 2011; Reed et al., 2020). The principle of self-determination emphasizes the importance of Indigenous communities taking control of their own development path, prioritizing community values and objectives, and ensuring the maintenance of long-term community wellbeing; including cultural, spiritual, economic, social, and territorial wellbeing. (C. G. Atleo, 2015; Boron & Markey, 2020; Corntassel, 2012; Corntassel & Bryce, 2011; MacNeill, 2020; Reed et al., 2020). How the process of self-determination appears in practice, and consequently the process of achieving sustainable community development, can differ from community to community. The CBA literature does, however, illustrate ways in which CBAs can contribute to sustainable community development in a general sense including the following: facilitating sustainable economic and social development, restructuring power dynamics and allowing for Indigenous communities to assert sovereignty, remaining durable policy tools in the long term, mitigating adverse impacts, reducing conflict between negotiating parties, securing community approval, establishing new partnerships, and complementing IA processes.

It should be noted that numerous articles utilized both frames when analyzing CBAs, resulting in the percentages adding up to over 100% (Table 2.1). These two CBA frames and their subcomponent themes, which are more specific ways in which CBAs are characterized, are discussed in more detail below.

Table 2.1. CBA frames, themes, and number of articles using frames

Frame (General)	Theme (Specific)	Number and (%) of Articles	
<i>Instruments that...</i>	<i>Instruments that...</i>		
Reinforce and legitimize the status quo of natural resource governance. (72%)	Perpetuate unequal power dynamics between the community, project developer, and senior levels of government.	78	60%
	Perpetuate injustices and/or disagreements within or between communities.	27	21%
	Enable senior levels of governments to abdicate their responsibilities to provide services to communities.	26	20%
	Undermine the role of other regulatory mechanisms	6	5%

Facilitate sustainable community development. (81%)	Facilitate economic and social development in remote communities.	61	47%
	Restructure power dynamics and allow communities to assert sovereignty.	44	34%
	Remain durable policy instruments in the long term	36	28%
	Mitigate the adverse impacts of natural resource development.	27	21%
	Establish new partnerships.	24	18%
	Reduce conflict between communities, project developers, and/or senior levels of government.	16	12%
	Secure community approval.	14	11%
	Complement impact assessment processes.	8	6%

2.3.1. Reinforce and legitimize the status quo of natural resource governance

Perpetuate unequal power dynamics between developer and community

The most prominent theme in the reinforcing and legitimizing the status quo frame views CBAs as problematic mechanisms that perpetuate unequal power dynamics between communities, project developers, and senior levels of government. Authors cite concerns regarding various characteristics of CBAs that contribute to the unequal power dynamics of CBAs, most notably the lack of transparency and confidential nature of CBAs (Agbaitoro, 2018; Alcantara & Morden, 2019; Fidler & Hitch, 2007; G. Gibson & O’Faircheallaigh, 2010; Hira & Busumtwi-Sam, 2018; Howard-Wagner, 2010); lack of capacity at the community level (Alcantara & Morden, 2019; Hira & Busumtwi-Sam, 2018; Howard-Wagner & Maguire, 2010; Scambary, 2009; Weitzner, 2006); lack of comprehensive policy requiring or guiding CBA design, negotiation, implementation, monitoring, and enforcement (Grégoire, 2013; Howard-Wagner, 2010; Levitan, 2013; O’Faircheallaigh, 2002; Peterson St-Laurent & Le Billon, 2015; Shanks & Lopes, 2006; Tysiachniouk & Petrov, 2018); inequitable distributions of project benefits (Brereton & Everingham, 2006; Scott, 2020; Tysiachniouk et al., 2018; Tysiachniouk & Petrov, 2018; Weitzner, 2006); and lack of decision-making authority (Alcantara & Morden, 2019; Altman, 2009; Caine & Krogman, 2010; Resolve, 2015).

Additionally, the literature emphasizes that CBAs appear to prioritize finalizing an agreement expeditiously rather than ensuring positive outcomes for communities. Authors cite various concerns in support of this including the tendency for negotiations to

be initiated and dominated by project developers (Alcantara & Morden, 2019; Dreyer, 2005; Howard-Wagner & Maguire, 2010), existing policy institutions and processes that favour industry (Altman, 2009; Caine & Krogman, 2010; Howard-Wagner & Maguire, 2010; Howlett & Lawrence, 2019; Wanvik, 2016), lack of transparency in consultations and negotiations (Dalaibuyan, 2015; Dylan et al., 2013), and a focus on tangible benefits and costs such as revenue and jobs and avoidance of less tangible benefits and costs such as social and cultural factors (Caine & Krogman, 2010; Papillon & Rodon, 2017).

Increasing project certainty is a significant priority of project developers, which can be achieved through negotiating a CBA. Project certainty can be increased in ways that can benefit the community, such as through the project developer receiving social license to operate through honest methods that give proper consideration to the needs of the community, or, ideally, securing FPIC from the community (Fidler, 2010; Heisler & Markey, 2013; Mahanty & McDermott, 2013; Neale & Vincent, 2017). However, some authors argue that the primary purpose of providing benefits to communities, and negotiating CBAs, is to meet the interests of project developers by increasing project certainty and corporate profits. In support of this argument, authors identify concerns regarding CBAs including the incorporation of stipulations that prohibit communities from voicing concerns regarding the project CBA after the agreement has been signed (Caine & Krogman, 2010; Cameron & Levitan, 2014; Levitan, 2013), speculation that project developers are negotiating CBAs to avoid litigation and to ensure that the project gets developed, rather than as an act of goodwill towards communities (Gilmour & Mellett, 2013; Matiation, 2002; Neale & Vincent, 2017), and project proponents strategically investing in communities that have the most political leverage to impact decisions on development approvals and ignoring communities without political leverage (Heisler & Markey, 2013).

A significant consequence of unequal power dynamics is that CBAs can hinder claims of territory and natural resource sovereignty (Peterson St-Laurent & Billon, 2015). Negotiating a CBA and providing consent for a project can be perceived as the community relinquishing or restricting its ability to exercise rights and title over its territory (Peterson St-Laurent & Le Billon, 2015; Wanvik, 2016). As discussed, CBA stipulations may inhibit communities from voicing concerns in the future, consequently diminishing future decision-making power and natural resource sovereignty (Caine & Krogman, 2010; Cameron & Levitan, 2014; Howard-Wagner & Maguire, 2010; Levitan,

2013). Additionally, negotiating a CBA can commit a community to a certain type of development, often economic with a primary focus on financial payments and jobs, limiting the community's ability to pursue alternative forms of development in the future or to practice self-determination (Papillon & Rodon, 2017).

Enable senior levels of government to abdicate their responsibilities to provide services to communities

A second theme within the reinforcing and legitimizing the status quo frame views CBAs as instruments that enable senior levels of government to disengage from directly providing services to communities. Various concerns are raised in the literature regarding how the provision of benefits in a CBA are used to justify the withdrawal of senior levels of government and the privatization of service provision. The withdrawal of senior levels of government inevitably reduces the level of scrutiny and leaves communities more vulnerable to reduced benefits and services, potentially resulting in less favorable outcomes for communities (Fidler, 2008; Heisler & Markey, 2013; Hummel, 2019). The withdrawal of senior levels of government also places the onus of equitable benefit distribution on project developers, who are arguably less informed regarding local and regional governance systems than senior levels of government, which can create issues of inequitable benefit distributions among communities (Heisler & Markey, 2013). Some authors argue that senior levels of government are not as absent from the process as they may appear in that they help construct the CBA process with the goal of continuing to influence natural resource governance from a distance (Levitan, 2013; Peterson St-Laurent & Le Billon, 2015; Scott, 2020). In cases where services previously provided by senior levels of government have been replaced by benefits provided by private companies, communities are also left vulnerable when projects cease operations, potentially resulting in situations where communities are left with little or nothing in terms of services (Howlett et al., 2011). In this situation, the economic wellbeing of a community is heavily dependent on the quantity of benefits received over the lifetime of the project as well as how the benefits were utilized to ensure long-term economic sustainability.

Perpetuate injustices and/or disagreements within or between communities

Another common theme within the status quo frame focuses on injustices within or between communities as a result of CBAs. Authors raise concerns over a potential lack

of communication between community decision makers and the rest of the community, which can result in the CBA not accurately reflecting broader community objectives (Boakye et al., 2018; Martin, 2009; Papillon & Rodon, 2017; Resolve, 2015), exclusion of marginalized groups in CBA decision making and negotiations (Graben et al., 2019; Horowitz et al., 2018; Keenan et al., 2016; Kuokkanen, 2011; Weitzner, 2006), rifts within and/or between communities that result from disagreements over objectives and priorities (Horowitz et al., 2018; Howlett, 2010; Mills & Sweeney, 2013), and unequal distribution of benefits among members of communities (Bruckner, 2015; Dylan et al., 2013; Holcombe, 2009; Tysiachniouk et al., 2018). Finally, project developers may negotiate with certain communities, or sub-communities, while neglecting other communities (Heisler & Markey, 2013; Weitzner, 2006). This may occur intentionally, when project developers strategically prioritize negotiations with communities with more political leverage or bargaining power, or unintentionally, in cases where senior levels of government have withdrawn and project developers are uninformed regarding local or regional governance systems (Heisler & Markey, 2013).

An additional dimension of the injustice theme is the perpetuation of gender inequality within communities negotiating CBAs. J. Keenan and Kemp (2014) assert that natural resource development and CBAs often exclude the rights and interests of women and that men secure the largest distribution of benefits within the community. Additionally, Indigenous women often suffer a disproportionately high share of the costs associated with developing resource industries, such as sexual exploitation and violence (G. Gibson & Klinck, 2005; Horowitz et al., 2018; Kuokkanen, 2011). Ofor and Sharp (2012) recognize through a case study that CBA negotiation processes are not necessarily designed to ensure equal gender representation and, as a result, the burden is placed upon women and other potentially marginalized groups to assert influence over the CBA design. J. Keenan et al. (2016) observe that while gender lenses are common in the field of community development, they are often not applied to CBA design or negotiation processes. Gender inequality in resource development and CBAs is identified as an area that requires significantly more attention (Graben et al., 2019; Horowitz et al., 2018; Keenan et al., 2016).

Undermine the role of other regulatory mechanisms

The final theme within the status quo frame identified in the review views CBAs as instruments that undermine the role of other regulatory mechanisms. Most notably, authors identify potential conflict between CBAs and regulated IA. The lack of integration between private CBAs and IA has the potential to result in communities negotiating subpar agreements due to lack of complete information regarding project impacts in cases where a CBA is negotiated before an IA is completed (Klein et al., 2004).

Additionally, Grégoire (2013) observes the potential for a CBA negotiation to serve as a substitute for public consultation as part of the IA, resulting in an incomplete assessment of the public interest regarding a proposed project. Cameron and Levitan (2014) build on this point and caution that if CBAs contribute to satisfying the Crown's duty to consult, this shifts the duties and responsibilities to industry and removes barriers to capital accumulation. Noble and Birk (2011) identify the potential for environmental monitoring provisions negotiated as part of a CBA to be inadequate and provide a community with inaccurate data that conflict with regulated IA monitoring and follow-up processes.

2.3.2. Facilitate sustainable community development

Facilitate economic and social development in remote communities

The second broad CBA frame is that CBAs are *instruments that facilitate sustainable community development*. The most prominent theme within this frame is that CBAs are viewed as instruments that provide opportunities for economic and social development in remote communities, allowing communities to become more economically diverse and self-sufficient and less reliant on senior levels of government. In support of this theme, authors posit that CBAs can provide economic opportunities, such as revenue generation from projects (Agbaitoro, 2018; Alcantara & Morden, 2019; Bocoum et al., 2012; Cascadden, 2018; Dale, 2020; Fidler, 2010; V. Gibson, 2008; Glasson, 2017; Kielland, 2015; Resolve, 2015), and non-revenue benefits, such as employment and training opportunities (Agbaitoro, 2018; Fidler & Hitch, 2007; V. Gibson, 2008; O'Faircheallaigh, 2006), local business opportunities (O'Faircheallaigh, 2010a; Shanks & Lopes, 2006; Wanvik, 2016) and new community infrastructure (Agbaitoro, 2018; Cameron & Levitan, 2014; Glasson, 2017; O'Faircheallaigh, 2006). Some authors argue that many communities would not receive these benefits in the absence of CBAs, and note that CBAs fill a gap in service provision that may be the responsibility of senior

levels of government (Alcantara & Morden, 2019; Cameron & Levitan, 2014; Levitan & Cameron, 2015; O’Faircheallaigh, 2004, 2010a; Shanks & Lopes, 2006).

CBAAs can also help build community capacity. For example, upfront payments through the CBA process may allow communities to hire experts to help negotiate CBAs as well as help build an inventory of specialized information pertaining to their territories (Bullock et al., 2019; Limerick et al., 2012; Wanvik & Caine, 2017). Additionally, training and education secured through CBA negotiation helps ensure that community members can pursue future employment opportunities (O’Faircheallaigh, 2010a).

Ultimately, achieving sustainable community development does not just require communities to generate benefits from the project but also requires the community to utilize the benefits effectively and in line with community or Indigenous rights and interests to promote long-term community wellbeing (O’Faircheallaigh, 2018). While communities are responsible for determining their own objectives and strategies for utilizing the benefits, authors provide various strategies that can contribute to sustainable community development including diversifying their economies (Bocoum et al., 2012), creating long-term investment funds (O’Faircheallaigh, 2010a), distributing revenues to the community members that need them most (O’Faircheallaigh, 2018), and funding projects that promote cultural preservation (V. Gibson, 2008).

Restructure power dynamics and allow communities to assert sovereignty

Within the facilitating sustainable community development frame, another theme views CBAs as instruments that restructure power dynamics in natural resource governance. Authors assert that CBAs help improve communities’ negotiating positions (Conde & Le Billon, 2017; Shanks & Lopes, 2006), provide a platform for raising issues not adequately addressed through alternative regulatory mechanisms and processes (Fidler, 2010; Harvey & Nish, 2005), provide communities with increased decision-making power and the ability to oversee and monitor projects (Alcantara & Morden, 2019; Danso et al., 2016; Galbraith et al., 2007; O’Faircheallaigh, 2010a; Wanvik & Caine, 2017), provide legally binding contracts that require developers to fulfill their obligations (Fidler, 2008; Gathii & Odumosu-Ayanu, 2016; US Department of Energy, 2017), influence corporate and government policy (Le Meur et al., 2013), and incorporate consent into the negotiation process (Cascadden, 2018; Mahanty & McDermott, 2013; Papillon & Rodon, 2017).

Through restructuring power dynamics, CBAs can enable communities, most notably Indigenous communities in Canada and Australia, to assert sovereignty over territories and natural resources. Authors identify key ways in which CBAs contribute to sovereignty and self-determination by allowing communities to take back control of natural resources from senior levels of government and shift away from government dependency (Cameron & Levitan, 2014; Clark, 2002; Fidler, 2008; V. Gibson, 2008; Levitan & Cameron, 2015; O’Faircheallaigh, 2008; Peterson St-Laurent & Le Billon, 2015). While the withdrawal of the state and privatization of service provision can be seen as reinforcing the status quo, as discussed earlier, the withdrawal of the state may also be seen as a positive phenomenon from the community’s perspective and an indication of independence from the authority of senior levels of government (Cameron & Levitan, 2014). Levitan and Cameron (2015) explain that the withdrawal of government from direct service provision should not necessarily be viewed as an act of abdication on the part of government, but as a diplomatic act that endorses self-governance and can result in mutual satisfaction among communities, project developers, and senior levels of government. In some cases, the benefits and services received by communities through CBAs exceed the services previously provided by government (Levitan & Cameron, 2015). Additionally, the revenues received from projects can be flexible and may be utilized in ways that are more in line with community objectives than the rigid, potentially inadequate, services previously provided by senior levels of government (O’Faircheallaigh, 2004). Also, negotiating CBAs can provide acknowledgement and, in some cases, protection of rights and title (Fidler, 2008, 2010; V. Gibson, 2008). These characteristics of CBAs lead some authors to conclude that CBAs are an appropriate component of the process of reconciliation (Craik et al., 2017; Gilmour & Mellett, 2013; Langton & Palmer, 2003).

Remain durable policy tools in the long term

Numerous articles view CBAs as durable policy instruments that are likely to have long-term potential, citing many of the beneficial characteristics presented above. Alcantara and Morden (2019) view CBAs as flexible, dynamic instruments that enable Indigenous communities to establish rights and title in a more efficient manner compared to alternative processes such as comprehensive land claims. Knotsch and Warda (2009) and Papillon and Rodon (2017) assert that CBAs are currently the best mechanism available to Indigenous communities to collect benefits from resource projects. Jones

and Bradshaw (2015) identify the merits of mechanisms such as CBAs in addressing the deficiencies of IA. O’Faircheallaigh and Corbett (2006) and O’Faircheallaigh (2008) recognize that CBAs have the potential to benefit communities by increasing Indigenous participation in natural resource governance and protecting Indigenous rights and title.

Mitigate the adverse impacts of natural resource development

Another theme within the facilitating sustainable community development frame is that CBAs are instruments that are useful for mitigating adverse, primarily environmental, impacts associated with resource development. Authors identify multiple ways in which CBAs can be used to mitigate impacts including using decision-making power to influence the design of the project to avoid sensitive areas (e.g., culturally sensitive areas or hunting/fishing areas) and ensure it follows sustainability best practices (O’Faircheallaigh, 2010b, 2017), incorporating components that are not adequately addressed through IA such as cumulative impact assessment (Galbraith et al., 2007; O’Faircheallaigh, 2017), offsetting potential adverse impacts with financial compensation (Kielland, 2015), and developing environmental monitoring programs (Craik et al., 2017; Fitzpatrick, 2007; O’Faircheallaigh, 2010a).

Establish new partnerships

Partnerships developed through CBA negotiation can be in the form of coalitions between communities, in cases where communities work together to negotiate with a project developer or senior level of government (Horowitz et al., 2018; Offor & Sharp, 2012; Wanvik & Caine, 2017). Partnerships are also established between communities and project developers or senior levels of government. Some authors focus on the structural characteristics of CBAs and characterize them as instruments that outline contractual obligations between parties, creating professional partnerships (Fischer, 2007; Galbraith et al., 2007; Gathii & Odumosu-Ayanu, 2016; Llewelyn & Tehan, 2004; Resolve, 2015; Wilson, 2016). Other authors focus on the collegial characteristics of CBAs and depict them as instruments that build trust between parties, outlining mutual respect as a necessary component to a successful agreement (Bullock et al., 2019; Harvey & Bice, 2014; Resolve, 2015; Sternberg et al., 2020).

Partnerships created through CBAs are important due to their contributions to sustainable community development. Communities that invest in a project and become

equity partners can benefit from securing increased decision-making power and receiving a portion of project revenue (Shanks & Lopes, 2006). As discussed, sustainable community development places an emphasis on communities managing their own development, rather than relying on senior levels of government (Boron & Markey, 2020; Connelly et al., 2013; Corntassel, 2012; Corntassel & Bryce, 2011; Halseth et al., 2018; Reed et al., 2020; Spiliotopoulou & Roseland, 2020; Valente, 2012). A community that invests in a project positions itself to help guide project design and operations and ensure that these are in line with community objectives (Agbaitoro, 2018; Shanks & Lopes, 2006). While decision-making power may be a priority for certain communities, a significant trade-off is that revenue generated through a partnership may be highly variable since it is directly linked to project profitability, which will fluctuate with changes in commodity prices.

Reduce conflict between communities, project developers, and/or senior levels of government

Conflicts surrounding natural resource governance is prevalent and well documented (Galbraith et al., 2007; Gillingham et al., 2016; Keenan et al., 2016; O’Faircheallaigh, 2003, 2017; Resolve, 2015; Söderholm & Svahn, 2015). In Canada, these conflicts often manifest as high-profile protests and court cases, with Indigenous peoples asserting that their rights and title are not to be ignored. Litigation has been recognized as a mechanism for increasing the bargaining power of communities, but it can be tremendously costly and time consuming for all parties involved (Matiation, 2002). The topic of conflict reduction has already been introduced in terms of increasing project certainty (under the reinforcing and legitimizing the status quo frame), but conflict reduction through CBA negotiation is also viewed in a positive manner from the perspective of communities (Agbaitoro, 2018; Dorobantu & Odziemkowska, 2017; Dyck, 2013; Le Meur et al., 2013; O’Faircheallaigh, 2017; Sternberg et al., 2020). Reduction in conflict potentially signals a positive CBA outcome that leaves a community in a more favorable position than it was without the CBA (Alcantara & Morden, 2019; Cameron & Levitan, 2014; Levitan & Cameron, 2015; O’Faircheallaigh, 2004, 2010a). While positive CBA outcomes are not guaranteed and community objectives are variable and context dependent, CBAs can be used to address issues, by the developer committing to provide economic benefits and/or adverse impact mitigation measures, that are not

adequately addressed through alternative mechanisms and could otherwise motivate litigation (Agbaitoro, 2018; O’Faircheallaigh, 2017).

Secure community approval

Negotiating a CBA may assist in securing community approval for resource projects, also referred to as obtaining a “social license to operate” (SLO) (Bruckner, 2015; Dorobantu & Odziemkowska, 2017; Fidler, 2010; Prno & Slocombe, 2012). From the perspective of project developers, managing stakeholders and rightsholders and obtaining a SLO from communities is important for increasing project certainty and protecting their investments (Dorobantu & Odziemkowska, 2017; Prno & Slocombe, 2012). Some argue that project developers’ aspirations for obtaining a SLO is part of a shift towards corporate social responsibility (CSR), where project developers are not only accountable to the interests of their shareholders but also to local stakeholders and rightsholders (Dorobantu & Odziemkowska, 2017; Gathii & Odumosu-Ayanu, 2016; Prno & Slocombe, 2012).

The CSR movement is in part driven by a recognition that conflict generated by natural resource projects has negative consequences for communities and the project developers themselves (Dorobantu & Odziemkowska, 2017). Ideally, the process of a project developer securing a SLO from a community via CBA negotiation will be collaborative, inclusive, and transparent, therefore ensuring the community’s rights and interests are respected and reflected in the CBA and project design (Craik et al., 2017). Some authors assert that negotiating a CBA is a component of a community providing FPIC for a project (Cascadden, 2018; Mahanty & McDermott, 2013; Papillon & Rodon, 2017). It is cautioned, however, that the version of FPIC represented in CBA negotiations is not a comprehensive one and is often restricted to economic issues (Papillon & Rodon, 2017). Additionally, whether or not the accommodation provided through the CBA is equitable will depend on the capacity of the community to negotiate a favorable agreement (Mahanty & McDermott, 2013).

Complement impact assessment processes

The final theme within the facilitating sustainable community development frame is that CBAs are instruments that complement IA. While this topic has been discussed in the reinforcing and legitimizing the status quo frame, regarding CBAs undermining

regulatory processes, and has some overlap with the securing community approval and mitigating adverse impacts themes, this theme focuses more on the merits of CBAs and IA working in tandem. IA is a regulatory mechanism designed to determine whether a project is in the public interest, estimate adverse impacts associated with the project, and determine what conditions should be attached to the project design to mitigate adverse impacts (Galbraith et al., 2007; T. Gunton et al., 2020).

The deficiencies of IA are well documented in the literature (Fidler, 2010; Galbraith et al., 2007; T. Gunton et al., 2020). While legislated consultation and accommodation processes in IA have improved, they still do not necessarily require consent from communities (Peterson St-Laurent & Le Billon, 2015). Negotiating a CBA can be considered a proactive approach to engaging with communities that goes beyond IA consultation processes in that it is consent-based and requires community approval (Cascadden, 2018; Mahanty & McDermott, 2013; Papillon & Rodon, 2017). IA is an effective tool for assessing whether a project is in the broader public interest and estimating how the project will impact sustainability on regional and national scales, but does not always fairly consider community level impacts (Galbraith et al., 2007)

CBAs allow for a focus on community-level sustainability and can be used by communities to ensure issues potentially overlooked by IA are addressed (Agbaitoro, 2018; Fidler, 2010; Fidler & Hitch, 2007; Galbraith et al., 2007; Sosa & Keenan, 2001). IA and CBAs appear to be parallel processes that, when used in tandem, allow for a more comprehensive approach to assessing whether a project is in the public interest while simultaneously promoting sustainable community development (Agbaitoro, 2018; Fidler, 2010; Galbraith et al., 2007). Authors caution, however, that more research must be done to analyze the effectiveness of CBAs and how they interact with IA (Fidler, 2010; Galbraith et al., 2007).

2.4. Discussion

The results of the systematic review indicate that there is a lack of consensus regarding the core role and outcomes of CBAs, as multiple frames and themes emerged from the analysis. This, however, is not a surprising result given some of the main characteristics of CBAs. CBAs are still relatively recent phenomena and while they have received some academic attention, it is likely that they will continue to be studied for some time before

any kind of broader consensus is reached regarding their role and efficacy. CBAs are also very dynamic instruments that are context and time dependent. This means that CBA provisions and designs change from agreement to agreement dependent on the objectives of the communities negotiating them. These objectives in turn may be influenced by expectations and broader rights or policy regimes that shift over time. Additionally, while research accessibility may be improving, many CBAs are confidential which makes it challenging to undertake comprehensive empirical research to determine the role of CBAs.

It is important to note that there does not necessarily need to be consensus regarding the role of CBAs and whether they are in fact beneficial to the parties that negotiate them. In reality, viewing policy and the policy development process through multiple analytical frameworks or conceptual lenses allows for a more comprehensive interpretation of policy (Allison, 1969). Allison (1969) suggests that, when analyzing policy, an analyst's first step should be to examine the "present product" through inspecting existing explanations, methodologies, and conceptual models used to examine policy and reflect upon unresolved issues and questions, which is in line with the objective of this systematic review.

The findings and implications of the systematic review are discussed below. First, we provide a discussion on the connections between CBA frames and perceptions of the "policy problem" that CBAs are intended to address. Second, we explore the use of integrative approaches to analyzing CBAs, and policies in general, and how these approaches help improve policies. Third, we address the overarching question of whether natural resource development is beneficial in terms of regional and local level economic development. Finally, we discuss the use of empirical evidence in CBA literature.

Each aspect of a CBA, as a policy instrument, is perceived differently depending on how the CBA is framed. For example, the underlying problems that CBAs are designed to address differ, depending on the perspectives and objectives of each of the negotiating parties. From the perspective of Indigenous communities, the perceived problem may be that resource development projects occur without due regard for Indigenous rights and title and result in negative environmental, economic, social, and cultural impacts on Indigenous communities. From the perspective of private project

developers, the perceived problem may be that there is too much uncertainty around developing natural resource projects. And from the perspective of senior levels of government, which are responsible for defending the public interest, the perceived problem may be that there are conflicting objectives around resource and land use, and these objectives must be fairly considered and managed to seek outcomes that meet the interests of all stakeholders at different scales. While these perceptions of the problem that CBAs address are generalized, they demonstrate the variability in how a party can perceive an issue. On the surface, CBAs appear to be an appropriate policy instrument for addressing each of these versions of the underlying problem surrounding natural resource development. But the systematic review clearly indicates that there are contrasting ways in which CBAs have been framed, and consequently numerous perspectives on whether CBAs are an appropriate policy instrument for achieving the objectives of each of the involved parties.

As the utilization of multiple conceptual frameworks and acknowledgement of alternative problems and objectives contribute to more comprehensive understandings of policies, the debate and tension created between the two conflicting CBA frames contributes to a deeper understanding of CBAs. The existence of both frames in CBA literature inevitably leads to a focus on identifying and evaluating the strengths and weaknesses of CBAs and how they can be improved, rather than simply accepting or rejecting CBAs as suitable instruments. Additionally, the interplay between the two themes helps identify questions that remain unanswered and topics that require further attention, prompting more research and new approaches to analyzing CBAs which will arguably improve future CBAs.

It is important to acknowledge that some authors utilize more integrative approaches to analyzing CBAs and characterize the role of CBAs using both frames (reinforcing and legitimizing the status quo and facilitating sustainable community development), and therefore their articles were categorized under both frames. While, for the most part, these authors view CBAs as durable and beneficial instruments for communities, they also identify deficiencies of CBAs. Literature that utilizes both frames is prevalent in the theme that views CBAs as durable policy tools, but these articles are not necessarily limited to this theme. For example, while Alcantara and Morden (2019) commend the flexibility and efficiency of CBAs, they also assert that the issue of power dynamics in CBA negotiations must be addressed and suggest that the roles of

Indigenous communities in CBA design and negotiation have been limited and reactive. Knotsch and Warda (2009) and Papillon and Rodon (2017) view CBAs as one of the better instruments currently available to Indigenous communities, but caution that community leaders must be more proactive and collaborative to ensure CBAs lead to sustainable communities in terms of their social, environmental, and economic wellbeing. Jones and Bradshaw (2015) believe CBAs can be an improvement over processes such as IA but believe existing CBAs fail to capture the impacts of colonialism on Indigenous wellbeing. O’Faircheallaigh and Corbett (2006), O’Faircheallaigh (2008), and Cueva (2017) recognize the potential of CBAs to benefit communities, but claim that they fall short in practice due to issues of weak bargaining positions. The approaches taken by these authors correspond with the assertion that tension between conflicting themes is beneficial, since they identify both the strengths and weaknesses of CBAs and indicate key areas that require improvement.

Another critical and in some ways more fundamental question related to CBAs is whether communities are better off with or without resource development. This is a key underlying question that directly affects a determination of the merits of CBAs that, for the most part, the CBA literature does not address. While natural resource development has the potential to provide economic benefits on local, regional, and national scales, there are significant risks associated with developing resource projects. The profitability of projects that develop raw, staple resources and the economic benefits that accrue to the local and regional economies are heavily dependent on commodity prices set by foreign markets, a predicament supported by Staple theory (Bertram, 1963; T. Gunton, 2003; Hayter & Patchell, 2016; Innis, 1933; Mackintosh, 1936; Watkins, 1963). Literature on this topic is mixed, with some believing that staple industry projects leave regional, and sometimes national, economies in precarious positions, often referred to as the “resource curse” (Agbaitoro, 2018; Carson, 2011; T. Gunton, 2003; Halseth & Ryser, 2016; Markey et al., 2012, 2019; O’Faircheallaigh, 2018; Ryser et al., 2019; Watkins, 1963). Others argue that staple industries can lead to a more diversified economy that will bring long-term benefits to a region while also supporting national development objectives (T. Gunton, 2003; Mackintosh, 1936; Watkins, 1963). The lack of consensus regarding the economic impacts of raw natural resource industries is akin to the lack of consensus regarding the core role of CBAs, and again reveals the highly contextual

nature, applicable at different scales, of resource projects and their regulatory environments.

Depending on the design of the CBA fiscal instruments (e.g., net profit royalty), CBAs have the potential to impose economic dependencies on a community, making it difficult to develop a diverse and sustainable economy. Various authors discuss the potential shift in a community's economic dependency from the state to the project developer and the associated issues and opportunities (such as Cameron & Levitan, 2014; Craik et al., 2017; Howlett et al., 2011; Peterson St-Laurent & Billon, 2015). Negotiating a CBA can also establish a dependency between a community's economy and a potentially volatile foreign market for the natural resource. Determining whether natural resource development can benefit a community is a critical step that must be taken before determining whether CBAs can benefit a community, and this is an important topic that requires further attention.

A common characteristic of the literature examined in the systematic review is the lack of empirical evidence used to support the frames and themes, a characteristic that has been identified as common in CBA literature (O'Faircheallaigh, 2016, 2021). Many authors use theoretical or anecdotal evidence to support their evaluations of CBAs and the ways in which they frame the role of CBAs. This is likely due to a prevalent view in the literature that CBAs are for the most part confidential documents, making it difficult to access details regarding specific CBA provisions (Agbaitoro, 2018; Alcantara & Morden, 2019; Fidler & Hitch, 2007; G. Gibson & O'Faircheallaigh, 2010; Hira & Busumtwi-Sam, 2018). The view that CBAs are exceedingly confidential is perhaps exaggerated in the literature; various private CBAs can be easily accessed online and virtually all CBAs negotiated between communities and senior levels of government are publicly available. The lack of empirical evidence for the frames in the literature is a major limitation and the argument that CBAs are largely confidential does not necessarily justify the lack of empirical evidence. Empirical evidence is necessary for determining whether they are indeed beneficial to communities, and research must go beyond using anecdotal and subjective evidence in determining the success of CBA outcomes (O'Faircheallaigh, 2016, 2021). Ultimately, to determine the success of CBA outcomes, the impacts that CBAs have on communities in the long term must be analyzed. This type of research would be a significant contribution to the CBA literature and our understanding of the role of CBAs.

A few authors do use empirical evidence in their evaluations and frames of CBAs, and they should be acknowledged for their contributions. For example, Dreyer (2005) develops a set of criteria and an evaluation framework that considers the process and content of CBAs and incorporates project-related, community-related, government-related, and industry-related components. The framework is then applied to two case studies, and the emerging theme views CBAs as instruments that establish new partnerships and build trust, with the level of commitment from CBA signatories being the most important criterion for the success of the CBA (Dreyer, 2005). Loxley (2019) conducts a quantitative analysis to estimate the benefits and costs of the Mary River Project and its associated CBA on the regional Inuit by comparing the outcomes of the CBA to its stated objectives. Loxley (2019) concludes that the CBA has not maximized Inuit benefits in the short term and forecasts that the agreement will also fail to maximize Inuit benefits over the long term. O’Faircheallaigh (2016) conducts perhaps the most comprehensive empirical analysis by developing a set of criteria for evaluating CBAs in terms of environmental management, Aboriginal cultural heritage, Aboriginal rights and interests in land, financial payments, Aboriginal employment and training, business development, and implementation, and then conducting a macro analysis of 45 CBAs negotiated in Australia. From this analysis, O’Faircheallaigh (2016) concludes that the outcomes of the CBAs vary greatly in their success and infers that outcomes depend on Aboriginal political organization.

The use of empirical evidence is not necessarily limited to the three articles just noted, but it must be emphasized that the use of empirical evidence is relatively limited in the 130 articles analyzed in this study. While the articles that provide empirical evidence contribute greatly to our knowledge of CBA outcomes, it should be mentioned that there is a lack of consistent criteria and evaluation frameworks used in them. The lack of consistent evaluation criteria, combined with the ad hoc nature of CBAs, makes it challenging to compare between studies and draw broader conclusions regarding CBAs, especially for studies that evaluate a limited number of CBAs or limit the analysis to a single region.

2.5. Conclusion

The objective of this systematic review was to explore how the role of CBAs has been framed in the literature and, consequently, what the implications of these CBA frames

are for understanding the role of CBAs in the political economy of natural resource development. As stated, a lack of consensus regarding the core role of CBAs (whether they reinforce the status quo or whether they facilitate sustainable community development) as well as the lack of consensus regarding the economic impacts of raw natural resource industries (whether they leave regional and national economies in precarious positions or whether they lead to diversified, strong economies) makes it challenging to conclusively determine whether, on a fundamental level, CBAs benefit communities or not. It is important to acknowledge that making these determinations is ultimately the responsibility of each individual community and having the power to make that decision is part of community and Indigenous self-determination (Boron & Markey, 2020; Corntassel, 2012; Corntassel & Bryce, 2011; Reed et al., 2020). As discussed, CBAs are context-dependent, and their ability to benefit a community very much depends on the community's objectives. Additionally, as natural resource projects continue to be proposed, CBAs are likely to continue to be negotiated regardless of how they are framed in the literature.

Based on the assumption that CBAs will continue to be negotiated, research should focus on exploring methods for improving CBA outcomes for communities that negotiate them. This topic is covered by various guidebooks designed to inform communities on CBAs, how they can be negotiated, and the key provisions that should be incorporated (such as M. Browne & Robertson, 2009; G. Gibson & O'Faircheallaigh, 2010; C. Gunton et al., 2020; Szoke-Burke et al., 2018; World Bank, 2012). It is also covered by journal articles that identify deficiencies of CBAs and provide recommendations and best practices to improve them (such as Boakye et al., 2018; Cascadden, 2018; Conde & Le Billon, 2017; Dreyer, 2005; Knotsch & Warda, 2009; Miranda et al., 2005; Noble & Birk, 2011; O'Faircheallaigh, 2015; Papillon & Rodon, 2017; Siebenmorgen, 2010). Exploring methods for improving CBA outcomes, however, is a critical research topic that requires further attention.

As discussed, various articles utilize an integrative approach to analyzing CBAs. While many of these articles and guides view CBAs as favourable instruments with beneficial long-term implications, many also identify various issues currently hindering the success of CBAs that, if addressed, will improve CBAs and make them more durable instruments in the long run. Although this literature provides an enormous contribution to improving CBA designs, more research must be undertaken in critical areas, for

example: 1) determinants of CBA success (i.e., why some CBAs succeed in benefiting communities and why some fail), as asserted by O’Faircheallaigh (2015; 2020); 2) comprehensive instruments that can improve CBA outcomes for all involved parties; 3) the primary underlying question, the role of resource development on community-level economic development; and 4) more empirically-based research that uses consistent evaluation frameworks to quantitatively assess the impacts of CBAs and the factors affecting CBA outcomes.

The role of CBAs, and whether they are beneficial to communities or not, cannot be understood or resolved without resolving the larger underlying question of whether natural resource development leads to long run sustainable growth or economic dependency and stagnation followed by an eventual decline. Should communities integrate into world economies by pursuing export-based resource development subject to the uncertainty of international commodity cycles and finite local natural resources or pursue alternative community-based development strategies focused on meeting local needs to avoid the resource curse? This is the fundamental choice that communities must make and the literature on this predicament is certainly far from resolved. But if communities do choose the resource development path and, consequently, the CBA path, identifying best practices for designing and negotiating CBAs is an important and beneficial research priority.

Chapter 3. Informing public interest determinations in impact assessment using a multiple account evaluation framework

Abstract

This article presents a comprehensive multiple account evaluation (MAE) framework that is intended to inform public interest determinations in impact assessment (IA). Using MAE methodology; which involves separating impacts into government revenue, economic activity, environmental, social, health, and Indigenous accounts; the proposed “Public Interest MAE Framework” seeks to inform senior government decision makers on all the positive and adverse consequences associated with a proposed project in a manner that allows for analysis of key trade-offs from the perspective of society as a whole. The proposed framework is applied to a case study to demonstrate how the framework functions in practice. Additionally, a survey is conducted with IA practitioners, experts, stakeholders, and Indigenous groups to evaluate the proposed Public Interest MAE Framework. The primary conclusion of this study is that the Public Interest MAE Framework has the potential to inform public interest determinations and overcome many of the limitations associated with other estimation methods used in IA. Finally, opportunities and challenges associated with integrating the Public Interest MAE Framework into IA are explored.

3.1. Introduction

Determining whether a proposed project is in the public interest is an essential step in the impact assessment (IA) process and, undoubtedly, can be a complex and challenging task for decision makers. Ideally, public interest determinations and the information used to support determinations should align with best practices of IA including being transparent, rigorous, accurate, and evidence based (International Association for Impact Assessment and Institute of Environmental Assessment, 1999; Joseph, Gunton, & Hoffele, 2020). But due to methodological limitations, the information used to support public interest determinations in IA can be inadequate, which therefore provides an opportunity to revise the process for collecting and presenting information to decision makers.

This study seeks to improve the public interest determination and decision-making process in IA by developing a comprehensive multiple account evaluation (MAE) framework that is designed to transparently assess project impacts and inform decision makers of the trade-offs associated with a proposed project. This chapter begins with a summary of alternative methods used to assess impacts and inform public interest determinations in IA. Following this, we present the methodology used to develop the Public Interest MAE Framework, which includes a literature review, a case study, and a survey with IA experts and practitioners. Next, we present the results of the case study analysis with the goal of demonstrating how the Public Interest MAE Framework functions in practice. Subsequently, we present the results of the survey. Next, based on the results of the case study and survey, we evaluate the Public Interest MAE Framework's capacity to assess project impacts and inform public interest determinations compared to the current process. Finally, we present conclusions and identify next steps and future research needs.

3.2. Impact Assessment and Public Interest Determination Methods

The IA process is designed to identify and estimate the positive and adverse consequences of a proposed project, mitigate adverse impacts, and ultimately decide whether a project is in the public interest and whether it should be approved (Impact Assessment Agency of Canada, 2021; International Association for Impact Assessment, 2009). Methods for assessing project impacts and informing public interest determinations in IA should be comprehensive, transparent, and accurate and should allow for consideration of all relevant benefits and costs associated with a project. Unfortunately, current methods used in IA to inform public interest determinations do not fully meet these criteria. The results of our literature review of alternative methods for estimating project impacts and informing public interest determinations are discussed below.

3.2.1. Qualitative impact characterization

Assessment of project impacts and public interest determinations in IA normally involve qualitative summaries of a project's benefits and adverse impacts. Qualitative impact characterizations often utilize scale-based rating systems to indicate the severity of

impacts (e.g., high, medium, low) and often cover the key characteristics of impacts including their magnitude, geographic extent, timing, frequency, and duration (Ehrlich & Ross, 2015; Orenstein et al., 2019). While qualitative descriptions can be useful for summarizing impacts that are challenging to quantify, exclusively relying on qualitative impact characterizations, especially in the context of assessing impact significance, can make it particularly challenging to compare the costs and benefits of a project (Retief et al., 2013; Williams, 2019) and consequently can make it challenging to transparently and defensibly determine whether a project is in the public interest (Fonseca & Gibson, 2021). This challenge can be exacerbated by the potential for IA processes to utilize ambiguous and/or inconsistent definitions of impact characterizations and indicators (Ehrlich & Ross, 2015; Joseph, Gunton, & Hoffele, 2020; Orenstein et al., 2019; Retief et al., 2023).

3.2.2. Economic impact analysis

Currently, economic impacts for proposed projects are primarily estimated in IA following economic impact analysis (EconIA) methodology and using input-output models. EconIA—which estimates direct, indirect, and induced impacts of a project—can provide useful information on regional and intersectoral impacts (C. Davis, 1990; T. Gunton et al., 2020; Kinnaman, 2011). EconIA, however, can significantly overestimate the benefits of a project by assuming no opportunity costs or supply constraints on resources required to build and operate the project and estimating gross as opposed to net project impacts (C. Davis, 1990; Grady & Muller, 1986; Gretton, 2013; T. Gunton et al., 2020; Hallin, 2010; Joseph, Gunton, & Hoffele, 2020; Joseph, Gunton, Knowler, et al., 2020; Kinnaman, 2011; Troiano et al., 2017; Williams, 2019). This assumption can be especially problematic when estimating employment impacts as it assumes that all of the workers employed on a project (gross employment) would be unemployed if the proposed project did not proceed. In a well-functioning economy, many, if not all, employees would likely be employed by other projects or in other sectors if a project did not proceed (Joseph, Gunton, Knowler, et al., 2020; Shaffer, 2010; Winter et al., 2021). Additionally, EconIA uses terms such as total person years of employment that can result in misinterpretation of the number of jobs created (Broadbent, 2014; T. Gunton et

al., 2020).⁷ Consequently, EconIA should not be relied upon as the sole method for estimating economic consequences, and in particular economic benefits for informing public interest determinations.

3.2.3. Benefit-cost analysis

Benefit-cost analysis (BCA) is a well-accepted and comprehensive tool based on a solid theoretical foundation that involves estimating the positive and adverse consequences of a proposed project to calculate its net impact from the perspective of society as a whole (Boardman et al., 2017; T. Gunton et al., 2020; Hanley, 2001; Pearce, 1998; Pearce et al., 2006). The Government of Canada has developed guidelines for conducting BCA and requires the use of BCA to determine whether proposed government regulations are in the public interest (Treasury Board of Canada Secretariat, 2018). While not often used in IA in Canada, BCA is regularly used in IA in other countries including Australia and South Africa (Department of Environmental Affairs and Tourism, 2015; Gillespie & Bennett, 2015). BCA overcomes some of the methodological limitations of the current public interest determination process in IA by estimating project impacts in monetary terms, where feasible, to allow for a comparison of benefits and burdens and by estimating net rather than gross project impacts (Gillespie & Bennett, 2015; T. Gunton et al., 2020). BCA can also be used to assess sustainability impacts of a proposed project (Joseph, Gunton, Knowler, et al., 2020) and assess how alternative project designs and mitigation measures affect net project benefits. The merits of using BCA in IA are acknowledged in a recent IA report on the Grassy Mountain Coal Project. In its report, the joint review panel recommends that BCA should be used in combination with EconIA to provide decision makers with the information needed to evaluate projects (Alberta Energy Regulator & Impact Assessment Agency of Canada, 2021). The limitations of BCA are that certain impacts that cannot be easily quantified in dollar values may be omitted from the analysis, it can be challenging to determine who has standing in the analysis (i.e., the scope of the analysis) (Gillespie & Bennett, 2015; Joseph, Gunton, Knowler, et al., 2020), sensitivity analyses used to assess the range of possible project parameters and address uncertainty (e.g., construction costs, value of outputs,

⁷ E.g., a single employee holding a job for 25 years of operations is often presented as 25 person years of employment in EconIA even though it is only one job held by a single individual or one average annual person year of employment.

environmental risks, discount rates, etc.) can result in wide variability in estimates (Atkins & MacFadyen, 2008; Bromley & Vatn, 1994; Pearce et al., 2006; Sagoff, 2007), and certain types of information that decision makers are likely to seek, such as the total number of jobs created by a project and impacts of a project on gross domestic product (GDP), are not normally included in BCA (Joseph, Gunton, & Hoffele, 2020; Joseph, Gunton, Knowler, et al., 2020).

3.2.4. Sustainability assessment

Sustainability assessment is a complex method that involves analyzing the impacts of a project from a multidisciplinary, long-term, and integrated perspective that often follows a goals-oriented approach in which the estimated impacts of a project are assessed based on sustainability targets (Bond et al., 2012; R. Gibson et al., 2013; OECD, 2010; Sala et al., 2015). Sustainability assessment is not necessarily a well-defined method in the literature as there appears to be a lack of consensus regarding what sustainability assessment is and how to define it (Bond et al., 2012). Narrow interpretations of sustainability assessment include processes that support and guide decision making towards sustainability in a general sense (Bond et al., 2012) or processes that focus on what are referred to as the three pillars of sustainability, which include environmental, economic, and social impacts (OECD, 2010). Broader interpretations of sustainability assessment, however, adopt a more comprehensive version of sustainability and focus on a systems-based approach that covers economic, environmental, social, heritage, and cultural impacts and focus on the interactions between these impacts (R. Gibson et al., 2013; Sala et al., 2015). The strengths of sustainability assessment are that it uses short and long-term sustainability targets to assess projects, it can be comprehensive and cover all types of impacts, and it can incorporate qualitative and quantitative data. The limitations of sustainability assessment are that it often requires predefined sustainability targets, which can be challenging to develop, it requires information on cumulative impacts to assess the impacts of a project on sustainability targets, which are challenging to estimate, and as discussed, there is a lack of consensus regarding what sustainability assessment is and how to define it, which raises challenges in applying the method consistently.

3.2.5. Multiple account evaluation

Multiple account evaluation (MAE), also referred to as multiple account benefit-cost analysis, is a method that addresses many of the limitations of the methods outlined above by providing more accurate and transparent information for public interest determinations. MAE is a comprehensive method that integrates several methods—including qualitative impact characterization, BCA, EconIA, sustainability assessment, and other methods applicable to IA—to assess projects and communicates results in a matrix summary based on a number of indicators (T. Gunton et al., 2020; Shaffer, 2010; Winter et al., 2021). The strengths of MAE relative to other IA methods are that it attempts to estimate the net impacts of a project rather than gross impacts; provides a comparison of revenue, environmental, social, economic, and health dimensions in a comprehensive evaluative framework; disaggregates benefit and cost distributions between affected parties; provides results in a matrix summary that allows for a more transparent comparison of trade-offs (and consequently decreases subjective bias); and allows for the inclusion of qualitative data for impacts that cannot be easily quantified (T. Gunton et al., 2020; Shaffer, 2010). The limitations of MAE include the following: defining the accounts can be subjective, sensitivity analyses used to assess the range of possible project parameters can result in wide variability in estimates, and, since it integrates several methods into a single method, it possesses some of the limitations associated with these methods (T. Gunton et al., 2020; Shaffer, 2010).

3.3. Methodology

In developing the proposed Public Interest MAE Framework, this study relies on the Impact Assessment Agency of Canada's (IAAC) public interest determination requirements. Section 63 of Canada's *Impact Assessment Act 2019* outlines five factors that the Minister or Governor in Council (i.e., Cabinet) must consider when making a public interest determination: the extent to which the project contributes to sustainability, the extent to which the impacts of the project are significant, the implementation of mitigation measures, the impacts that the project may have on Indigenous groups and the rights and title of Indigenous peoples, and the extent to which the project contributes to environmental obligations and climate change commitments (Impact Assessment Agency of Canada, 2020a).

The general structure and the contents of the proposed Public Interest MAE Framework were informed by MAE methodology literature (Alberta Transportation, 2015; BC Ministry of Agriculture and Lands, 2007; BC Ministry of Transportation, 2014; Campbell & Brown, 2005; City of Saskatoon, 2018; Crown Corporations Secretariat, 1993; T. Gunton, 1992; Shaffer, 2010; United States Water Resources Council, 1983; Winter et al., 2021) as well as new IAAC guidance under the *Impact Assessment Act* (Impact Assessment Agency of Canada, 2020a, 2020b, 2020c, 2020d, 2020e). The contents of the Indigenous account were informed by IA guidance literature (BCEAO, 2020; Impact Assessment Agency of Canada, 2020b) as well as some recent publicly available Indigenous-led IA reports (Carrier Sekani First Nation, 2019; Keefer Ecological Services Ltd., 2019; Tseil-Waututh Nation, n.d.) and literature on Indigenous-led IAs (First Nations Energy and Mining Council, 2019; Shandro & Jokinen, 2018) that provide examples of the types of impacts that are important to consider from the perspective of Indigenous communities. Estimation methods and indicators were informed by methodology literature (Alavalapati et al., 1998; Arvanitis et al., 2015; BC Ministry of Agriculture and Lands, 2007; Boardman et al., 2017; Bond et al., 2012; D. Browne & Ryan, 2011; Campbell & Brown, 2005; R. Gibson et al., 2013; T. Gunton et al., 2020; Knetsch, 2020; Shaffer, 2010; Shandro & Jokinen, 2018; United States Water Resources Council, 1983; Vanclay, 2003; Vanclay et al., 2015) and IAAC guidance (Impact Assessment Agency of Canada, 2020a, 2020b, 2020c, 2020d, 2020e). The accounts and sub-accounts that were selected to be included in the proposed Public Interest MAE Framework are flexible and can be adapted to a particular project, ensuring that the values and objectives of all involved parties, and especially those of Indigenous groups, are reflected in the accounts and sub-accounts.

We applied the proposed Public Interest MAE Framework to a single demonstrative case study: the Mary River Iron Mine located on Baffin Island, Nunavut, Canada. Our analysis relies on publicly available information presented in IA documents produced by the Nunavut Impact and Review Board (NIRB) (Nunavut Impact Review Board, 2012, 2014b) and the project developer, Baffinland Iron Mines Corporation (Baffinland) (Baffinland Iron Mines Corporation, 2018a). Additionally, some of the inputs and assumptions in our analysis were informed by other studies that focus on the Mary River Iron Mine (Adebayo & Werker, 2021; Loxley, 2019; West & Lépiz, 2021). Our analysis was conducted in 2021 when Baffinland's proposal to expand the mine was

under review by the NIRB and our assumptions reflect the information that was available at the time. We estimated the financial and economic impacts of the project—including revenues accruing to the Inuit, senior levels of government, and Baffinland—using a discounted cash flow model developed in Microsoft Excel. When estimating financial and economic impacts, we use a real (inflation-adjusted) discount rate of 8% as this is the rate suggested by the Treasury Board of Canada for conducting benefit-cost analysis (Treasury Board of Canada Secretariat, 2007, 2018). We also estimated the cost of greenhouse gas (GHG) emissions following Environment and Climate Change Canada’s methodology and using its social cost of carbon estimates⁸ (Environment and Climate Change Canada, 2016). Additionally, two community benefit agreements (CBAs) negotiated between Baffinland and the Qikiqtani Inuit Association (QIA) were included in the analysis to estimate the distribution of project costs and benefits to local Inuit communities (Qikiqtani Inuit Association & Baffinland Iron Mines Corporation, 2013, 2020).

We conducted an online survey with IA experts, practitioners, and participants to evaluate the estimation methods currently used in IA and to evaluate the Public Interest MAE Framework. The survey consisted of statements that participants could respond to using a 5-point Likert scale (strongly agree, agree, neither agree nor disagree, disagree, or strongly disagree) as well as questions that participants could answer using comment boxes. We coded the comment box responses following qualitative content analysis methodology (Berg & Lune, 2017). We identified themes in the responses and manually matched responses to relevant themes using NVivo 12.

3.4. Public Interest MAE Framework

The proposed Public Interest MAE Framework builds on a number of existing MAE models to create eight accounts summarized in Table 3.1, below. The accounts and sub-accounts selected for a particular assessment are intended to capture the range of impacts as well as organize the impacts into relevant categories. The proposed accounts and sub-accounts were developed with an extractive natural resource project in mind but could be modified to accommodate for context and project-dependent characteristics.

⁸ Environment and Climate Change Canada’s social cost of carbon estimates are discounted at 3%.

The indicators for each account summarize the magnitude of the impacts and to provide decision makers with comprehensive information on all consequences to help inform public interest determinations. Additionally, the Public Interest MAE Framework includes sensitivity analyses to address uncertainty, analyzing how alternative parameters such as commodity prices and capital costs affect project feasibility and benefit and cost distributions.

The *project developer* account in the proposed Public Interest MAE Framework indicates the impact of the project on the developer's finances and is comparable to a private sector financial analysis. Estimating this account requires estimation of the net present value (NPV) of the entire project which indicates the overall profitability of the project and the total economic rent or monetary value of the project that is available for distribution amongst the various parties (e.g., project developer, senior levels of government, and Indigenous communities). Additionally, the NPV indicates the financial capacity to further mitigate adverse project impacts.

The other proposed accounts (*government revenue, economic activity, environmental, social, health, and Indigenous community*) assess the broader public interest impacts of the project. In practice, the sub-accounts and indicators for a particular project would likely be prescribed in the Tailored Impact Statement provided to the project proponent in the planning stage of the IA process. Valued components, which are specific impact topic areas that are identified by participants from Indigenous communities, stakeholders, and/or IA practitioners, would also be outlined in the Tailored Impact Statement in the early stages of an IA process. Since valued components are often specific to a certain project, they have not been explicitly listed in the Public Interest MAE Framework outlined below. In practice, valued components would be included in the relevant sub-accounts.

The *summary* account provides an overall summation of the project's costs and benefits to determine the net impact of the project. This account helps indicate whether the project is in the public interest by estimating its overall net impact. The other accounts help indicate the relative magnitude of the costs and benefits by type and by affected party.

Table 3.1. Public Interest MAE Framework

Account	Description	Potential sub-accounts and components	Potential estimation methods	Indicators
Project Developer	This account measures the impact of the proposed project on the project developer's finances.	Net revenue	Discounted Cash Flow Analysis (DCFA)	<p>1) The net present value (NPV) of the project developer's net revenue, in current Canadian dollars (CAD), indicates the net benefit (or cost) of the proposed project to the project developer.</p> <p>2) For resource projects, the percentage of total resource rent (% of total rent) to the project developer indicates the proportion of total resource rent that accrues to the project developer.</p>
Government Revenue	This account measures the fiscal impacts of the proposed project for federal, provincial/territorial, municipal, and Indigenous governments.	<p>Federal government revenue</p> <p>Provincial/territorial government revenue</p> <p>Municipal government revenue</p> <p>Indigenous government revenue</p>	DCFA	<p>1) Fiscal NPV indicates the net benefit (or cost) of the proposed project to governments. Net fiscal impact is defined as incremental revenue less incremental costs to government resulting from the project, which is different from most IAs that estimate only gross revenue to government.</p> <p>2) For resource projects, the % of total rent to government indicates the proportion of total resource rent that accrues to government. This also indicates the effectiveness of certain types of taxes and royalties at collecting rent and generating government revenue.</p>
Economic Activity	This account measures the impact of the proposed project on economic activity. This includes the net direct, indirect, and induced economic	<p>Economic activity</p> <p>Upstream and downstream economic impacts</p> <p>Consumer spending</p>	DCFA Economic Impact Analysis (EconIA)	The economic impacts of a project are normally measured in terms of impact on <i>economic output</i> , or <i>GDP</i> , and <i>employment</i> . GDP and employment impacts are measured in

	impacts to Indigenous communities, a region, and/or a nation; depending on the scope of the analysis, as a result of the development of the proposed project. The economic activity account is meant to capture impacts to upstream, downstream, and competing sectors.	Employment Training and education		<p><i>monetary units</i>. Employment can also be measured in <i>total person years of employment (PY)</i>⁹, for the construction phase of a project and <i>average annual PY</i>, for the operations phase. The impacts of a project on GDP and employment can be classified as a project's <i>net contribution to GDP</i> and <i>employment</i>. Further, these impacts can be classified based on scope including local/regional (including Indigenous communities), provincial/territorial, and national level impacts. Economic activity indicators are summarized as follows:</p> <p><i>Net...</i></p> <ul style="list-style-type: none"> a) <i>Contribution to national GDP</i> b) <i>Contribution to provincial/territorial GDP</i> c) <i>Contribution to regional/local GDP</i> d) <i>Contribution to national employment</i> e) <i>Contribution to provincial/territorial employment</i> f) <i>Contribution to regional/local employment</i> g) <i>Contribution to Indigenous employment</i>
Environmental	This account measures the impact of the proposed project on the natural environment. This account aligns with the	<p>Land and resources</p> <ul style="list-style-type: none"> • Terrestrial/arboREAL species • Land/topography • Private Property 	Environmental Assessment Sustainability Assessment	The environmental, social, and health accounts are likely to include monetary estimates, quantitative/physical unit estimates, and/or qualitative

⁹ One person year of employment is equivalent to 2,080 hours of work and is based on a 40-hour work week. Person year of employment is also sometimes referred to as full-time equivalent.

	<p>traditional interpretation of IA, covering impacts to land and resources, water/marine, air/atmosphere, and climate commitments. Any proposed mitigation measures that are intended to help offset adverse impacts will be included in the relevant sub-account.</p>	<ul style="list-style-type: none"> • Recreation • Archaeological and heritage sites <p>Water/marine</p> <ul style="list-style-type: none"> • Aquatic species • Hydrology, surface water and groundwater • Recreation <p>Air/Atmosphere</p> <ul style="list-style-type: none"> • Air quality • Greenhouse gas (GHG) emissions • Climate Commitments • Paris Agreement • Canada's 2030 GHG emissions targets • Net zero emissions goal 	<p>Cumulative Impact Assessment</p> <p>Non-market Valuation</p> <p>Revealed Preference</p> <p>Stated Preference</p> <p>Offset/Replacement Cost</p>	<p>impact characterizations. Non-market valuation methods can be used to estimate environmental, social, and health impacts.¹⁰ Specific indicators for the environmental account will vary from project to project depending on the potential impacts. Indicators of environmental impacts are likely to include:</p> <ol style="list-style-type: none"> 1) <i>Monetary estimates</i> (NPV); 2) <i>Quantitative/physical units</i> for impacts that cannot be estimated in monetary units; and/or 3) <i>Qualitative impact characterizations of impacts using a scale-based rating scheme</i> (e.g., magnitude, geographic extent, timing, frequency, and duration of the impacts) <i>or other level of measurement such as sustainability targets</i> for impacts that cannot be quantified or estimated in monetary units.¹¹
Social	<p>This account measures the social impacts of the proposed project. Social impacts include physical and/or cognitive social impacts that the proposed project may</p>	<p>Community services and infrastructure</p> <p>Community well-being</p> <p>Equality</p> <p>Gender</p> <p>Marginalized groups</p>	<p>Social Impact Assessment</p> <p>GBA Plus</p> <p>Non-market Valuation</p>	<p>Specific indicators for the social account will vary from project to project depending on the potential impacts. Indicators of social impacts are likely to include:</p> <ol style="list-style-type: none"> 1) <i>Monetary estimates</i> (NPV) (e.g., estimated cost of incremental

¹⁰ Non-market valuation methods often involve estimating a community's *willingness to pay (WTP)* for benefits provided by a project and *willingness to accept (WTA)*, or compensation demanded, for adverse impacts imposed by a project. Although WTP and WTA are similar in concept, it is important that they not be used interchangeably as they often result in different values (See Knetsch, 2020).

¹¹ Best practices regarding qualitative impact characterizations specify that parameter terms should be clearly defined to ensure transparency and consistency across IAs (See Orenstein et al., 2019).

	<p>impose on the public. These impacts are likely to be limited to nearby towns and communities, but there is also potential for some social impacts to extend to a region or nation. A priority of the <i>Impact Assessment Act</i> is the consideration of the distribution of impacts among genders and potentially marginalized groups, which can be estimated following Gender-based analysis plus methodology (GBA Plus). Additionally, a separate account could be added that focuses specifically on the distribution of impacts among genders and potentially marginalized groups. Project-related social impacts may stem from the development of community infrastructure or the provision of new or expanded services in the community.</p>		<p>Revealed Preference</p> <p>Stated Preference</p> <p>Offset/Replacement Cost</p>	<p>social service provision);</p> <p>2) <i>Quantitative/physical units</i> for impacts that cannot be estimated in monetary units; and/or</p> <p>3) <i>Qualitative impact characterizations using a scale-based rating scheme</i> (e.g., magnitude, geographic extent, timing, frequency, and duration of the impacts) <i>or other level of measurement such as sustainability targets</i> for impacts that cannot be quantified or estimated in monetary units.</p>
Health	<p>This account measures the health impacts of the proposed project. IAAC guidance adopts the World Health Organization's definition of health, describing it as '[a] state of complete physical, mental, and social well-being, and not merely the</p>	<p>Mental wellbeing</p> <p>Physical wellbeing</p>	<p>Health Impact Assessment</p> <p>Human Health Risk Assessment</p> <p>Non-market Valuation</p> <p>Revealed Preference</p>	<p>Specific indicators for the health account will vary from project to project depending on the potential impacts. Indicators of health impacts are likely to include:</p> <p>1) <i>Monetary estimates (NPV)</i> (e.g., estimated cost of incremental health service provision);</p>

	<p>absence of disease or infirmity' (World Health Organization, 1946). In addition to assessing health outcomes, IAAC guidance stresses the importance of assessing determinants of health, which cover a broad scope of factors that influence health outcomes. Additionally, upstream and downstream health impacts should be considered when assessing the health impacts of a proposed project.</p>		<p>Stated Preference Replacement/Offset Cost</p>	<p>2) <i>Quantitative/physical units</i> for impacts that cannot be estimated in monetary units; and/or 3) <i>Qualitative impact characterizations using a scale-based rating scheme</i> (e.g., magnitude, geographic extent, timing, frequency, and duration of the impacts) <i>or other level of measurement such as sustainability targets</i> for impacts that cannot be quantified or estimated in monetary units.</p>
Indigenous Communities ¹²	<p>This account measures the impacts of the proposed project on Indigenous communities. It should be noted that the impacts summarized in this account are likely to also be included in other accounts. For example, government revenue impacts will include Indigenous government revenue and national employment impacts will include Indigenous community employment impacts. Monetary estimates for these impacts, however, will only be accounted for once in the bottom-line sum of the summary account.</p>	<p>Indigenous government revenue Economic activity Environmental Social Health Governance</p>	<p>DCFA EconIA Environmental Assessment Sustainability Assessment Cumulative Impact Assessment Non-market Valuation Revealed Preference Stated Preference Replacement/Offset Cost Social Impact Assessment GBA Plus</p>	<p>Specific indicators for the Indigenous communities account will vary from project to project depending on the potential impacts. Indicators of impacts to Indigenous communities are likely to include:</p> <p>1) <i>Monetary estimates</i> (NPV); 2) <i>Quantitative/physical units</i> for impacts that cannot be estimated in monetary units; and/or 3) <i>Qualitative impact characterizations using a scale-based rating scheme</i> (e.g., magnitude, geographic extent, timing, frequency, and duration of the impacts) <i>or other level of measurement such as sustainability targets</i> for impacts that cannot be quantified or</p>

¹² For more information regarding Indigenous community sub-accounts, estimation methods, and indicators, see Appendix B.

	This account can be further disaggregated to accommodate multiple communities.		Health Impact Assessment	estimated in monetary units.
Summary	This final account measures the net impact of the proposed project to the public: the sum of all accounts above.	Project developer Government revenue Economic activity Environmental Social Health Indigenous communities	-	Generally, a positive net impact indicates that the proposed project is in the public interest and a negative impact indicates that the proposed project is not in the public interest. In addition to calculating the net impact of the proposed project in monetary terms, it is important that the summary account also includes other key pieces of information, such as quantitative/physical units and qualitative impact characterizations, to allow for a proper assessment of the trade-offs associated with the proposed project. Ultimately, it is the responsibility of the decision maker(s) to determine whether the proposed project is in the public interest and the Public Interest MAE Framework and its outputs are intended to help inform the determination and provide guidance on how the project can be modified to increase the net benefits to the public.

3.4.1. Indigenous Community MAE Framework

A second, companion framework was also developed as part of this study and is referred to as the Indigenous Community MAE Framework. The Indigenous Community MAE Framework provides a detailed assessment of impacts to Indigenous communities. All the information and impact estimates included in the Indigenous Community MAE Framework are also included in the Public Interest MAE Framework in a summarized

form. In addition to informing the public interest determination, the Indigenous Community MAE Framework is intended to serve as a tool and be used directly by Indigenous groups participating in IA and adapted based on the project and the community's objectives. Additionally, the Indigenous Community MAE Framework can be used by communities to inform the design and evaluation of CBAs negotiated with project developers and senior levels of government. Although this article does not go into detail on this second framework, more information on the Indigenous Community MAE Framework is included in Appendix A.

3.5. Case Study Analysis: Mary River Mine

We conduct a case study analysis of the Mary River Iron Mine, located on Baffin Island in Nunavut, Canada, to illustrate how the Public Interest MAE Framework functions in practice and to illustrate what type of information it is capable of providing to decision makers. The project developer, Baffinland, received initial approval for the mine from the NIRB in 2012 and approval for an amendment for an “early revenue phase” (ERP) in 2014 (Nunavut Impact Review Board, 2014b). The mine became operational in 2015. An application for the “Phase 2” expansion which would allow for an increase in production from its currently approved 4.2 million tonnes of iron ore per annum (MTA) to 12 MTA, was rejected by the NIRB and Canada's Minister of Northern Affairs in 2022 (Crown-Indigenous Relations and Northern Affairs Canada, 2022; Nunavut Impact Review Board, 2022). However, at the time this analysis was conducted the application was still under review and therefore the analysis includes the Phase 2 expansion. Also, it is possible that the proponent may submit a revised Phase 2 expansion application in the future.

It should be noted that the purpose of this case study is not to conduct a thorough assessment of the Mary River Mine and attempt to determine whether the correct decision was made to approve the ERP and/or reject the Phase 2 expansion. It is, rather, to demonstrate how the Public Interest MAE Framework functions in practice and verify whether its outputs help inform public interest determinations in the IA process. Many of the impacts have been estimated using qualitative impact characterizations instead of monetary or quantitative units for the case study—primarily in the environmental, social, health, and Indigenous accounts—due to data and, in some cases, methodological limitations. It is, however, possible to use non-market valuation

techniques to estimate the monetary values of many of the positive and adverse consequences. If the Public Interest MAE Framework or some version of it is integrated into IA policy, the use of non-market valuation methods would simplify comparison of trade-offs associated with the proposed project. Additionally, in practice it is critical that impact estimates in the *Indigenous community* account be directly informed by Indigenous communities. Non-market valuation methods used to assess impacts to Indigenous communities should follow best practices to ensure that their interests are accurately reflected (T. Atleo, 2023; Manero et al., 2022).

3.5.1. Case Study Results

An abbreviated version of the results of the case study analysis is presented in Table 3.2 and the complete results are included in Appendix B.

Table 3.2. Public Interest MAE Framework Summary Account: Mary River Case Study Results

Account	Sub-account	Summary of impacts	Net Impact (Reference price, Millions of 2020 CAD, black text indicates benefit and red text indicates cost)	Sensitivity (Low and high price/GHG cost scenarios, Millions of 2020 CAD)
Summary	Project Developer (Baffinland)	Net revenue impacts to the private project developer.	\$1,246	\$252 - \$1,844
	Government Revenue	Net revenue impacts of the mine for the federal government, Government of Nunavut, and Inuit governments.	\$1,217	\$645 - \$1,592
	Economic Activity	Net impacts of the mine on training and education, employment, and economic activity including upstream, downstream, and competing sectors. It is assumed that all fly-in fly-out employees would be employed elsewhere in the Canadian economy if the project did not proceed. Additionally, it is assumed that the majority of economic activity impacts are distributional and are	\$145	-

		approximately offset by the opportunity cost of the mine and/or net costs to other sectors. Therefore, economic activity benefits are limited to Inuit employment (\$23 million) and Inuit-owned businesses (\$122 million).		
	Environmental	Net impacts of the mine on land/topography, vegetation, archeological sites, aquatic species, surface water and groundwater, air quality, GHG emissions, and climate commitments. The environmental cost total includes the cost of impacts to air quality (\$25 million) and the costs of mine site, upstream, and downstream GHG emissions (\$767 million to \$3,261 million).	(\$792) Less incremental costs associated with impacts to terrestrial species, birds, permafrost disturbance, vegetation, archaeological and heritage sites, aquatic species, surface water and groundwater, and climate commitments.	(\$3,286) - (\$792) ¹³
	Social	Net impacts of the mine on the social wellbeing of the population of Canada.	Incremental costs associated with adverse impacts to social wellbeing. Net monetary impact not estimated.	-
	Health	Net impacts of the mine on the mental and physical wellbeing of the population of Canada.	Incremental costs associated with adverse impacts to mental and physical wellbeing. Net monetary impact not estimated.	-
	Inuit	Net impacts of the mine on the Inuit population of Nunavut.	\$564 ¹⁴ Less incremental economic activity (food harvesting and tourism businesses), environmental, social, health, and governance costs.	\$393 - \$682
Total	Overall Impact of Project	Net impacts of the mine including impacts to the private project developer.	\$1,817 (Excluding non-monetized project costs and benefits).	(Low GHG cost): \$250 - \$2,789 (High GHG cost): (\$2,245) - \$295

¹³ The range of GHG costs is based on Environment and Climate Change Canada's (2016) low and high social cost of carbon estimates.

¹⁴ Monetary benefit estimates for Inuit are accounted for in government revenue and economic activity accounts.

Canadian Public	Net impacts of the mine to Canada <i>excluding</i> impacts to the private project developer.	\$570 (Excluding non-monetized project costs and benefits)	(Low GHG cost): (\$2) - \$945 (High GHG cost): (\$2,497) - (\$1,549)
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3.6. Case Study Conclusions

While the results provide much of the same information normally included in IA, such as impacts on valued components and economic and fiscal impacts, the results go beyond conventional IA by organizing the information into explicit accounts, providing quantitative estimates of project benefits and adverse effects to allow for explicit assessment of the magnitude and significance of impacts, allowing for transparent comparison of impacts, indicating how the costs and benefits are distributed among parties, and providing a basis for assessing how a project can be designed to increase the net benefit to society. As discussed, the purpose of this case study is to illustrate the type of information that the Public Interest MAE Framework can provide to decision makers and not necessarily to conduct a thorough assessment of the mine. With this in mind, there are some interesting conclusions that can be drawn from the results.

The results of the case study analysis indicate that the Mary River Mine is estimated to generate an overall net benefit of \$1.8 billion (reference scenario), with a potential range based on the sensitivity analysis of between \$250 million and \$2.8 billion. This finding illustrates that there is considerable potential for the proponent to fund impact mitigation measures while still maintaining the economic viability of the mine. In this case, the net benefit of \$570 million is arguably the more accurate estimate of the benefit to Canada given the owners of the Mary River mine are based outside of Canada. Even if the more conservative net benefit estimate is used, there is still considerable potential for further mitigation and benefit redistribution. Additionally, the results indicate that the mine is expected to result in significant costs from adverse impacts such as GHG emissions (\$767 million) and impacts to air quality (\$25 million), indicating opportunities to increase benefits through implementing impact mitigation measures. The results also indicate how the total resource rents, which exclude environmental costs, are distributed among the various parties, with Baffinland receiving 52% of resource rents and the federal, Nunavut, and Inuit governments receiving 17%, 13%, and 18%, respectively. This information is helpful in identifying which parties gain

from the project and identifying opportunities to develop policies that achieve equitable benefit distributions.

The case study results also provide a more accurate assessment of project benefits than the more commonly used conventional EconIA methodology which estimates the gross impacts of a project and is therefore prone to overestimating the benefits and underestimating the costs. The contrasting results under the two methods are summarized in Table 3.3.

Table 3.3. Comparison of Economic Impacts for Mary River Mine

Indicator	Conventional Economic Impact Analysis	Multiple Account Evaluation
Gross employment	5,031 PY (construction) 903 to 1,177 PY (operations)	Not provided
Net employment	Not provided	Nunavut employment: 1,000 PY (construction) 178 to 232 avg annual PY (operations) Canada employment: 44 PY (construction, Inuit employment) 8 to 10 avg annual PY (operations, Inuit employment)
Employment benefit (\$)	\$559 million (wage bill)	\$23 million (net)
Economic benefit to Nunavut (\$) (including Government of Nunavut and Inuit)	\$7.7 billion (gross)	\$955 million (net)
Total benefit to Canada	\$12.2 billion (GDP) (EconIA)	\$1.8 billion (net)

3.7. Expert Survey for the Public Interest MAE Framework

A survey was conducted to gather information from IA experts, practitioners, and participants on several topics related to this study. A total of 36 respondents completed the survey. Since this study primarily focuses on federal IA policy, the majority of respondents were affiliated with federal government agencies that regularly participate in federal IA processes including IAAC, Natural Resources Canada, and Environment and

Climate Change Canada (Figure 3.1). The survey was also completed by respondents affiliated with Indigenous groups, universities/colleges, the private sector, and the Mackenzie Valley Review Board.

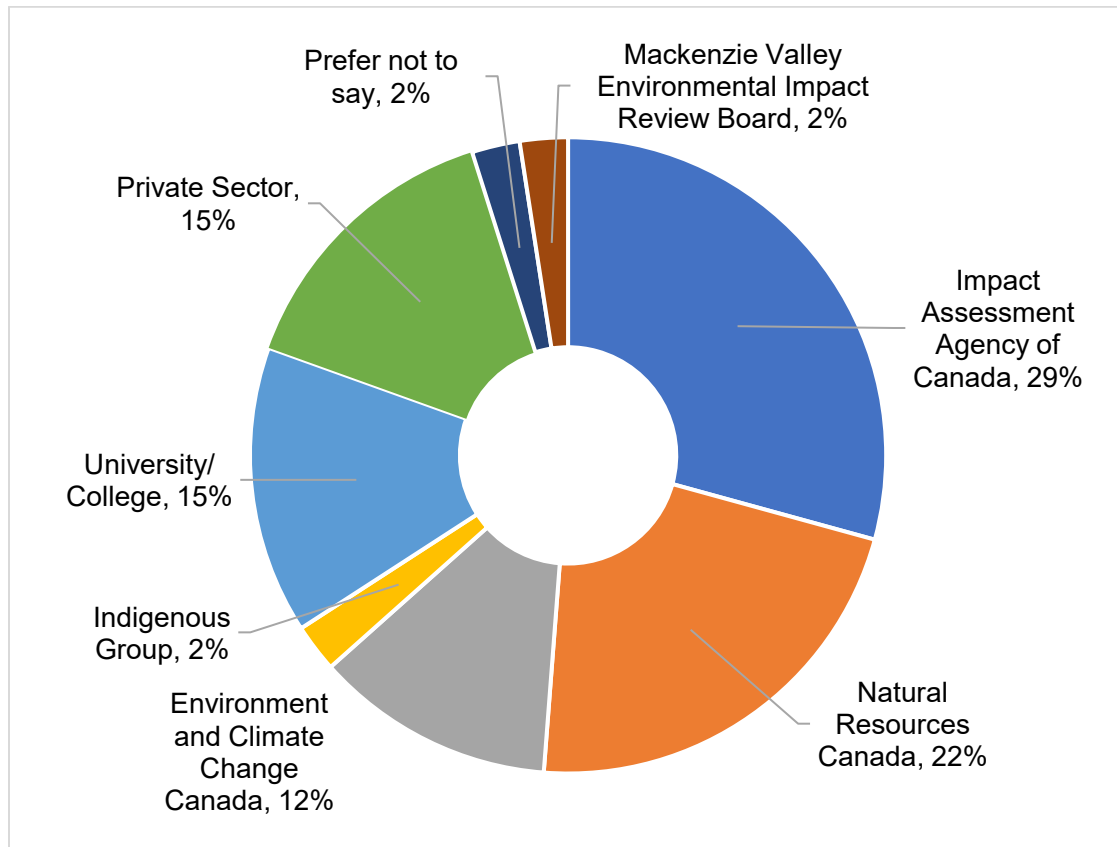


Figure 3.1. Organizational affiliations of survey respondents

The survey consisted of statements that participants could respond to using a 5-point Likert scale (strongly agree, agree, neither agree nor disagree, disagree, or strongly disagree) as well as questions that participants could answer using comment boxes. The figures displayed below, however, use a simplified 3-point scale (agree, neither agree nor disagree, or disagree). Survey topics include the following:

- Evaluation of existing estimation methods used in IA;
- Public interest and impact assessment;
- Evaluation of the Public Interest MAE Framework;
- Comparison between the Public Interest MAE Framework and existing estimation methods used in IA;

- Strengths and weaknesses of the Public Interest MAE Framework;
- Potential implementation challenges; and
- Suggested revisions to improve the Public Interest MAE Framework.

The Public Interest MAE Framework evaluation section of the survey was divided into ten sections based on best practice criteria for assessing the efficacy of methods adapted from Joseph et al. (2020) including suitability to context, flexibility, comprehension, subjectivity, robustness, usefulness of outputs, validity, participative qualities, equity, and consideration of Indigenous groups. Prior to completing the survey, respondents were provided with a draft report that included the details of the study, background information, a draft of the proposed Public Interest MAE Framework, and the results of the case study analysis.

3.8. Survey Results

The results of the survey are separated into five sections summarized below in Figure 3.2 through Figure 3.6. A more detailed version of the survey results that includes comment box responses is provided in Appendix C.

3.8.1. Evaluation of current estimation methods

The results of this section of the survey (Figure 3.2) indicate that respondents are critical of the current methods used to estimate impacts in IA. Only 35% of respondents believe that current estimation methods in IA provide a comprehensive assessment of impacts and just 18% believe that current estimation methods adequately consider impacts to Indigenous groups. The majority of respondents indicate that the current estimation methods do not clearly communicate trade-offs (62%), are prone to overestimating benefits (59%), and lack transparency in how they inform public interest determinations (68%).

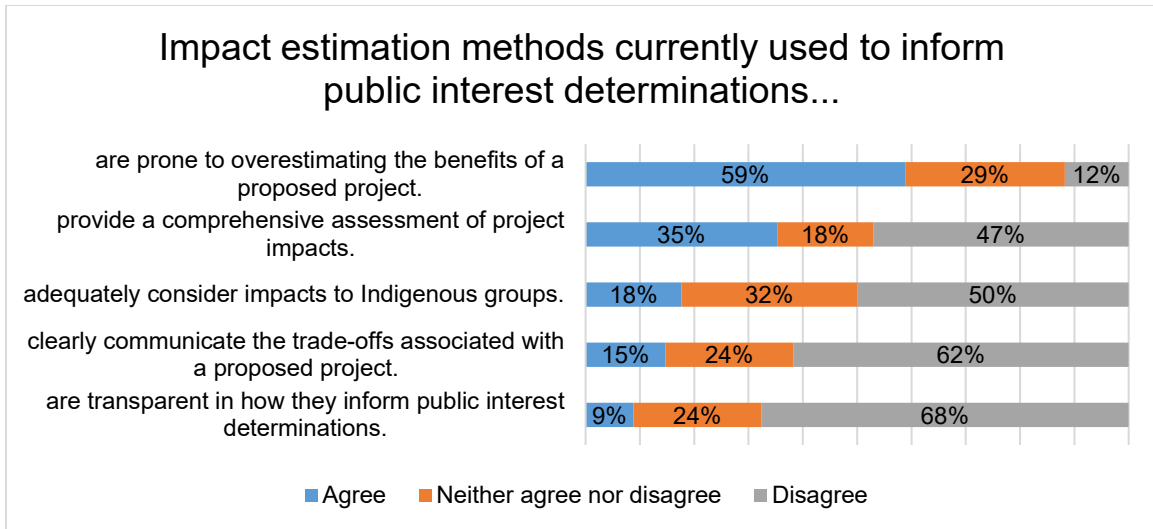


Figure 3.2. Survey results: Evaluation of current estimation methods

3.8.2. Public interest and IA

The results of this section of the survey (Figure 3.3) indicate that while the majority of respondents (61%) believe that a determination of whether or not a project is in the public interest should be the primary factor in deciding whether to approve a project, only 12% of respondents believe that the IA process ensures that projects are only approved if they are in the public interest and only 9% believe that current methods used in IA clearly indicate whether a project is in the public interest. Only 24% of respondents believe that the term public interest is clearly defined in the context of IA and 79% believe that the determination of whether a project is in the public interest involves subjective bias on the part of decision makers.

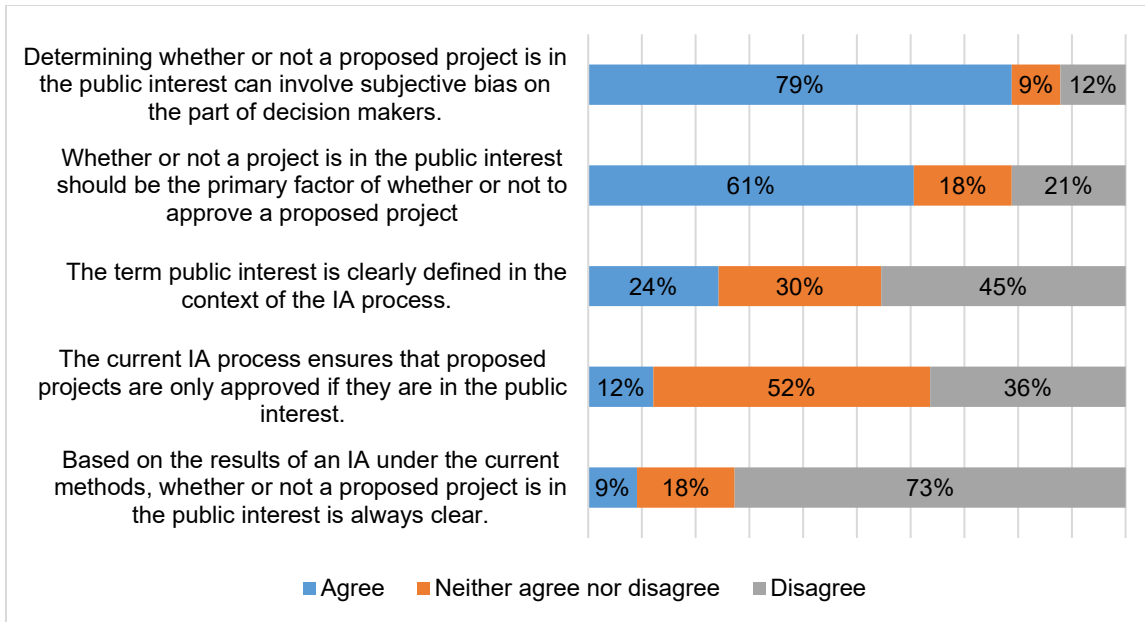


Figure 3.3. Survey results: Public interest and IA

3.8.3. Evaluation of the proposed Public Interest MAE Framework

The results of this section of the survey (Figure 3.4) indicate that respondents are generally supportive of the proposed Public Interest MAE Framework. As discussed, the evaluation of the framework was divided into ten sections based on best practice criteria for assessing the efficacy of methods. The proportion of respondents that believe the proposed Public Interest MAE Framework meets the ten criteria of an effective method ranges from 43% to 90% depending on the criterion, which far exceeds the proportion of respondents who believe that it does not meet the criteria (3% to 24%). The lowest ratings are for reducing subjectivity (43% agree and 17% disagree), facilitating public participation (48% agree and 10% disagree), and comprehensively assessing impacts on Indigenous communities (48% agree and 24% disagree).

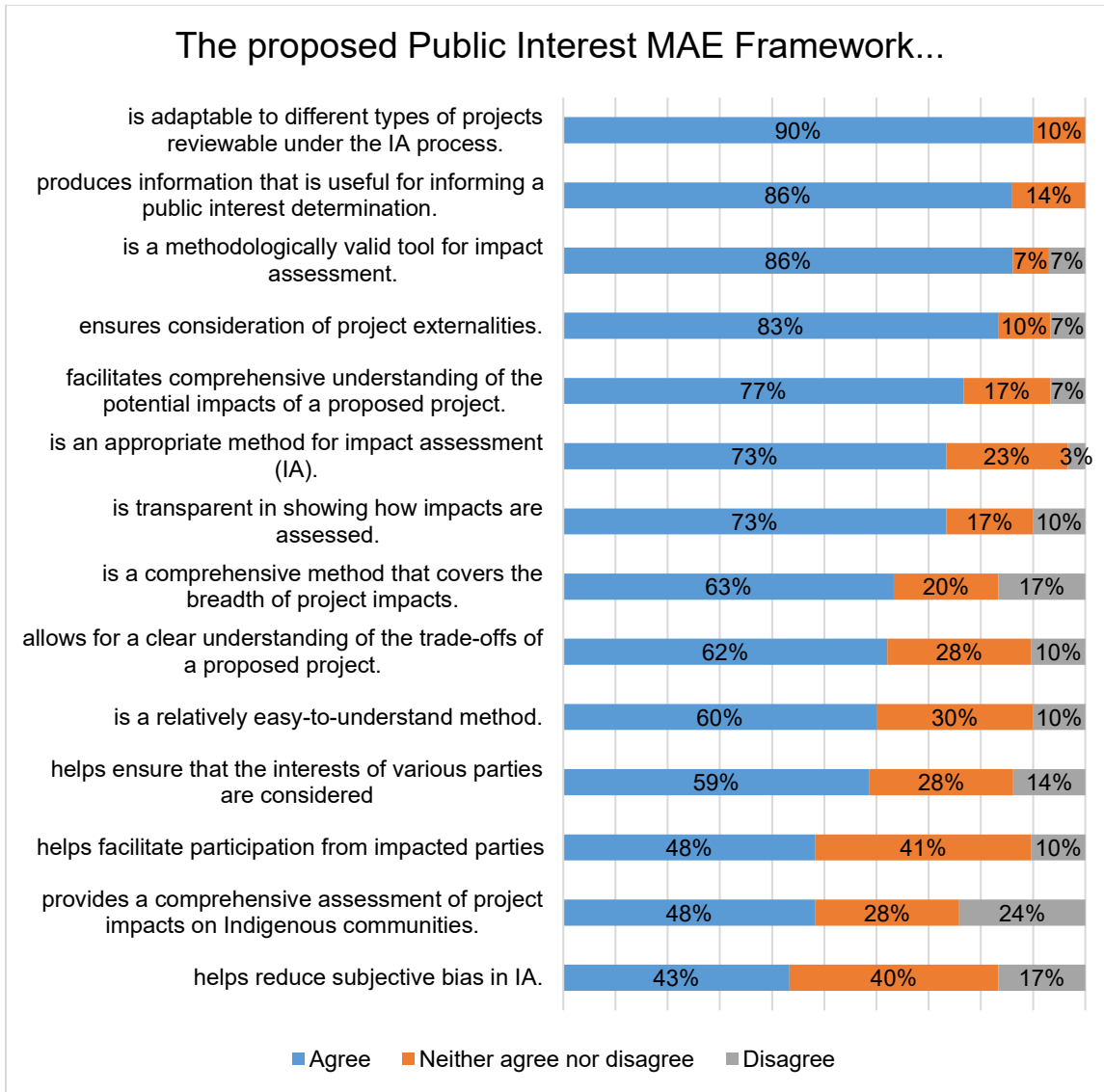


Figure 3.4. Survey results: Evaluation of Public Interest MAE Framework

3.8.4. Proposed Public Interest MAE Framework versus current estimation methods in IA

The results of this section of the survey (Figure 3.5) indicate that respondents believe the proposed Public Interest MAE Framework is an improvement over the current estimation methods used in IA. The majority of respondents indicate that when compared to the current estimation methods used in IA, the proposed Public Interest MAE Framework communicates trade-offs more clearly (93%), produces more comprehensive information (72%), is more transparent in how it informs public interest determinations (66%), is less prone to overestimating benefits (59%), and is less prone

to underestimating costs (52%). The proportion of respondents who agree that the framework considers impacts to Indigenous groups better than current methods used in IA is a bit lower (45% agree, 21% disagree, and 34% neither agree nor disagree).

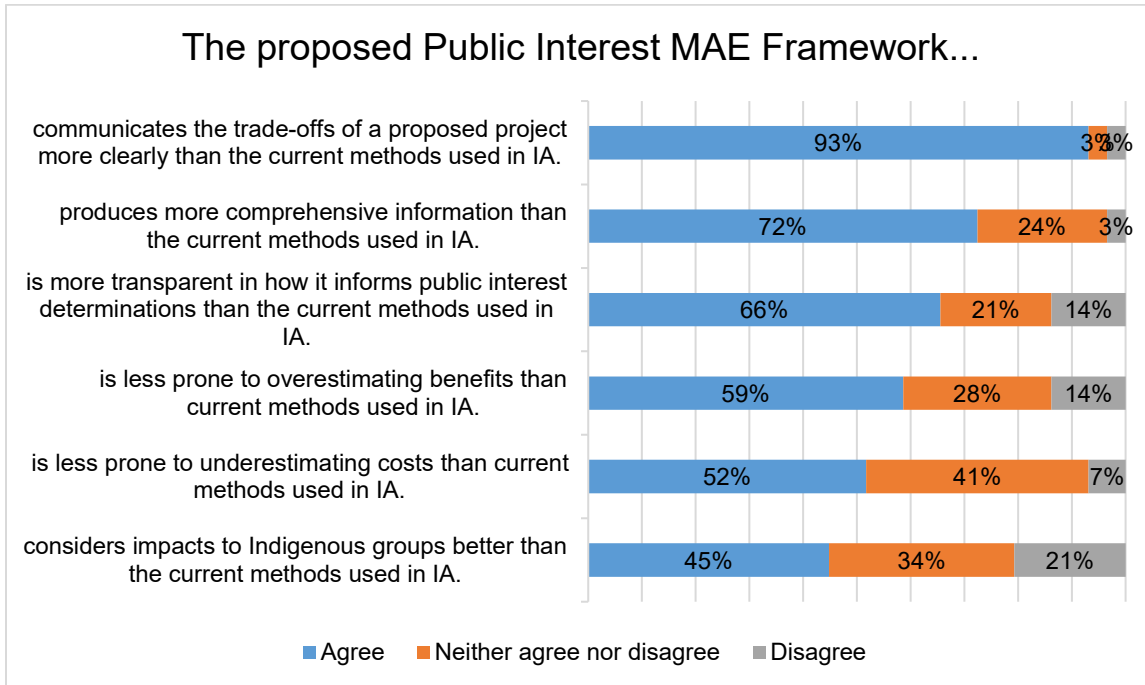


Figure 3.5. Survey results: Comparison between the Public Interest MAE Framework and current impact estimation methods

3.8.5. Potential of proposed Public Interest MAE Framework for IA

The results of this section of the survey (Figure 3.6) indicate that an overwhelming majority of the respondents believe that the proposed Public Interest MAE Framework has the potential to improve public interest determinations in IA (83%) and believe that it would be helpful to further develop and test the framework as a means of informing public interest determinations (93%).

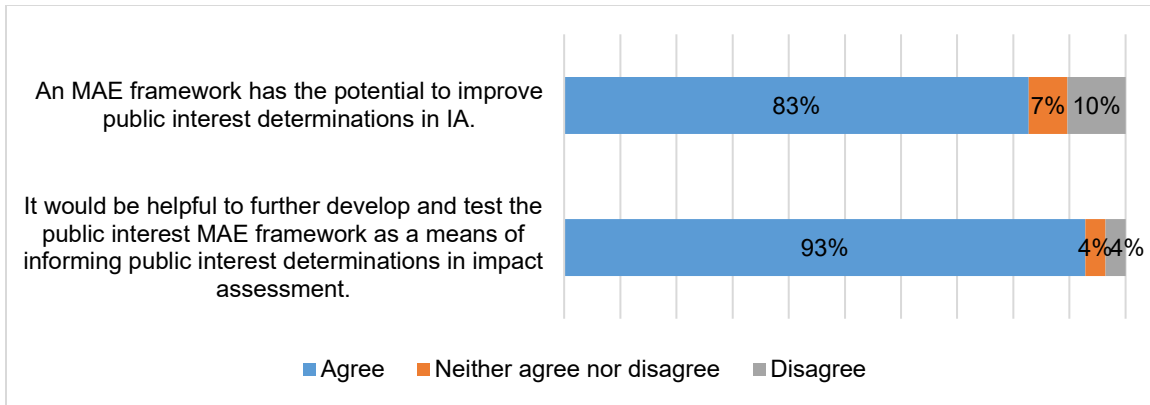


Figure 3.6. Survey results: Potential of Public Interest MAE Framework

3.9. Survey Conclusions

The survey provides some useful information related to the objectives of this study. Respondents identified a number of limitations with the impact estimation methods currently used in IA that should be addressed. On the topic of public interest, the respondents indicated that while public interest is a key factor in IA and project approval, many believe that the term itself and the extent to which it informs project decisions is unclear in the context of IA. In their evaluation of the proposed Public Interest MAE Framework, the majority of respondents indicated that the framework meets the ten best practice criteria and therefore possesses the characteristics of an effective impact estimation method. Additionally, in the comment box response section of the survey, the results of which are included in Appendix C, respondents identified strengths and weaknesses of the Public Interest MAE Framework, identified potential implementation challenges, and suggested revisions to improve the Public Interest MAE Framework. Finally, respondents indicated that the framework has the potential to be an improvement over the current methods used to inform public interest determinations in IA.

Importantly, the survey results provide further evidence that the proposed Public Interest MAE Framework, if integrated into the IA process, has the potential to improve public interest determinations. The survey results are also helpful in that they identified some of the weaknesses and potential challenges in implementing the Public Interest MAE Framework, which helped inform revisions made to the framework.

3.10. Conclusions

The objective of this study was to develop an MAE framework that could be used to support public interest determinations in IA. The Public Interest MAE Framework is intended to be an improvement over the methods currently used to estimate impacts in IA through a comprehensive consideration of various types of impacts, increasing the accuracy of impact estimates by estimating net impacts, increasing transparency by clearly displaying all benefits and costs, integrating quantitative and qualitative information, helping assess the relative significance of impacts, and allowing for comparison between trade-offs. The results of this study's case study analysis and expert survey are further evidence that the Public Interest MAE Framework has the potential to inform public interest determinations and overcome some of the limitations associated with other impact estimation methods. This is not to say that the Public Interest MAE Framework is an optimal method without limitations, but it does appear to be an improved method compared to the other methods commonly used in IA.

While the proposed Public Interest MAE Framework has the potential to support decision making in IA, it will likely require some refinements before it is ready to be implemented in IA. The expert survey results helped identify some of the weaknesses and potential challenges in implementing the Public Interest MAE Framework and helped inform the refinement process, but further refinement is likely necessary. Ideally, this study will help advance the field of IA best practices and is an initial step in integrating MAE into IA and improving the IA process.

Topics related to the Public Interest MAE Framework that will require further research include the following: determining how to compare quantitative and qualitative trade-offs to ensure there is not significant bias towards quantitative impacts; exploring how the Indigenous Community MAE Framework can be used by communities and how it informs the public interest determination; defining the process for identifying accounts, sub-accounts, and indicators; determining how the project developer account should factor into decision making and when it should be included in the bottom line net impact estimate; exploring how to integrate confidential financial information and sensitive traditional knowledge into the framework without disclosing this information publicly; integrating cumulative effects and investigating how the framework could be used in

cumulative effects assessment; and integrating sustainability assessment into the Public Interest MAE Framework.

Additionally, it would be useful to identify aspects of the Public Interest MAE Framework that could be adopted on an interim basis to improve IA processes while the larger framework is being refined. Some examples of interim steps that merit consideration include developing consistent definitions of indicators such as employment by using standardized terms such as average annual person years instead of total person years to avoid misinterpretation of project benefits, estimating net as opposed to gross impacts for economic indicators to avoid overestimating alleged project benefits, and conducting BCA to assess proposed projects based on current Treasury Board of Canada Secretariat (2018) guidelines. Implementing these relatively simple steps, and in time the Public Interest MAE Framework, would be transformational in improving the quality of information available to decision makers in IA and ensuring comprehensive consideration of the impacts of natural resource development.

Acknowledgements

We thank the survey respondents for their participation and for providing feedback on an earlier version of the Public Interest MAE Framework. We also thank the reviewers that pre-tested the survey and provided helpful feedback on its design. Next, we thank Dr. Chris Joseph, Dr. Marvin Shaffer, and Dr. Eric Werker for providing feedback on earlier versions of the Public Interest MAE Framework. Finally, we thank the Impact Assessment Agency of Canada for its support and for funding this research, and Natural Resources Canada and Environment and Climate Change Canada for their support throughout this study.

Chapter 4. How costly is a community benefit agreement for a private project developer?

Abstract

Community benefit agreements are common resource governance tools that are negotiated between local, often Indigenous, communities and private developers to help facilitate the development of major resource projects. This study addresses a major gap in the literature by estimating the cost of a CBA for a private project developer. We conduct a case study analysis of the Mary River Iron Mine located on Baffin Island, Nunavut, Canada, and the associated Mary River Inuit Impact and Benefit Agreement (IIBA) negotiated between Baffinland Iron Mines Corporation and the Qikiqtani Inuit Association (QIA). For the case study analysis, we use a discounted cash flow model to estimate the cost of the Mary River IIBA for Baffinland according to provisions of the IIBA including royalty payments, advance payments, Inuit employment and training, Inuit procurement, implementation funding, and the Ilagiiktunut community wellness fund. We then evaluate how the IIBA cost affects the economic viability of the mine and compare the IIBA cost relative to the mine's total cash costs and relative to a hypothetical cost of conflict. The results indicate that the cost of the Mary River IIBA for Baffinland is relatively low compared to the mine's total after-tax cash costs and appears to have a relatively marginal impact on the economic viability of the mine. Additionally, the results indicate that the lifetime, discounted cost of the IIBA is of the same order of magnitude as the cost of conflict, represented in the analysis as a one-year delay in operations.

4.1. Introduction

Community benefit agreements (CBAs), also referred to as impact and benefit agreements, are common resource governance tools that are negotiated between private project developers and local, often Indigenous, communities whose land must be accessed or disturbed for major extractive resource projects. A relatively recent body of scholarship has focused on the benefits received by local communities from CBAs and their associated natural resource development projects. According to the literature, CBAs have the potential to help facilitate economic and social development of Indigenous communities by providing revenue benefits (Adebayo & Werker, 2021;

Agbaitoro, 2018; Alcantara & Morden, 2019; Bocoum et al., 2012), employment and training opportunities (Adebayo & Werker, 2021; Agbaitoro, 2018; Fidler & Hitch, 2007; V. Gibson, 2008; O’Faircheallaigh, 2006), contracting opportunities for local businesses (Adebayo & Werker, 2021; O’Faircheallaigh, 2010a; Shanks & Lopes, 2006; Wanvik, 2016), new community infrastructure (Agbaitoro, 2018; Cameron & Levitan, 2014; Glasson, 2017; O’Faircheallaigh, 2006), and impact mitigation measures (Craik et al., 2017; Fitzpatrick, 2007; Kielland, 2015; O’Faircheallaigh, 2010b, 2017). A smaller group of studies has focused on the benefits of negotiating CBAs for project developers, including increasing project certainty and reducing the potential for conflict by securing consent from local Indigenous communities (Bruckner, 2015; Dorobantu & Odziemkowska, 2017, 2017; Fidler, 2010; Henisz et al., 2014; Prno & Slocombe, 2012). There is a need, however, for research that focuses on the costs of negotiating CBAs for project developers.

To the best of our knowledge, this is the first study to date to estimate the cost of a CBA for a private project developer, estimating the cost of the Mary River Inuit Impact and Benefit Agreement (IIBA) for a project developer, Baffinland Iron Mines Corporation (Baffinland), that was negotiated for the Mary River Iron Mine. This case study has received some attention in the past with studies analyzing community benefits from the IIBA (Adebayo & Werker, 2021; Loxley, 2019) and the economic viability of the mine (Loxley, 2019; West & Lépiz, 2021). These previous studies, however, do not analyze the impact of the IIBA on Baffinland. In addition to estimating the cost of the IIBA, this study estimates the impact of the IIBA on the economic viability of the mine and evaluates the cost of the IIBA relative to total after-tax project cash costs and relative to the cost of conflict. Conflict is prevalent in extractive natural resource development industries and CBAs are believed to help reduce conflict (Agbaitoro, 2018; Dorobantu & Odziemkowska, 2017; Dyck, 2013; Haggerty et al., 2023; Le Meur et al., 2013; O’Faircheallaigh, 2017; Sternberg et al., 2020).

CBAs negotiated in Canada are legally binding through contract law and set out obligations for project developers and local communities (M. Browne & Robertson, 2009; Cameron & Levitan, 2014; Fidler, 2008; G. Gibson & O’Faircheallaigh, 2010). Although CBAs are only legally required in certain regions in northern Canada in accordance with land claim agreements (Coppes, 2016), CBAs are negotiated for virtually every major extractive resource project developed in Canada. Some attribute the prevalence of

CBA to private developers recognizing the right of communities to free, prior, and informed consent as affirmed by the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) (Cascadden, 2018; Mahanty & McDermott, 2013; Papillon & Rodon, 2017) while others attribute the prevalence of CBAs to project developers managing social risk and attempting to satisfy consultation and accommodation requirements to obtain approval (Caine & Krogman, 2010; Cameron & Levitan, 2014; Grégoire, 2013). Ultimately, federal and provincial governments have a legal duty to consult and accommodate local Indigenous communities but some aspects of this duty can be delegated to private project developers (Newman, 2014; Peach, 2016). While the Canadian government has taken steps to recognize UNDRIP, legislation does not require consent from local Indigenous communities in order for consultation and accommodation requirements to be satisfied and for projects to be approved (Banks, 2020).

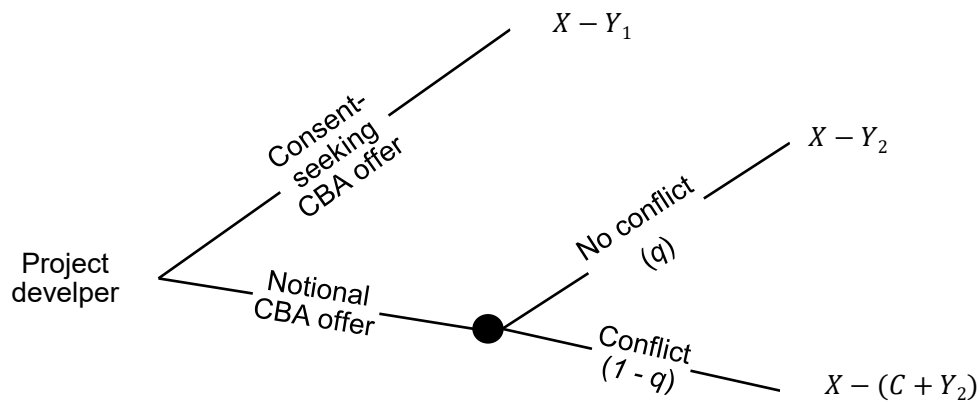
Theoretically, CBAs have the potential to build mutually beneficial relationships between private project developers and Indigenous communities and facilitate sustainable community development. The benefits provided to a community from a CBA are likely to be influenced by a number of factors including the fiscal mechanisms used (e.g., profit-based or volumetric royalty), the size of the project, the profitability of the project, the predicted adverse impacts of the project, the bargaining power held by each party, and, ultimately, the objectives of each party (Dale, 2020; Dorobantu & Odziemkowska, 2017; C. Gunton et al., 2021; C. Gunton & Markey, 2021; Odziemkowska & Dorobantu, 2021; O’Faircheallaigh, 1998, 2021). While CBAs can benefit communities and project developers, the benefits provided to communities, and the reduction in the likelihood of conflicts, often come at costs to project developers (Dorobantu & Odziemkowska, 2017; Odziemkowska & Dorobantu, 2021).

4.2. Theoretical Framing

4.2.1. Decision-making theory

CBAs are negotiated for virtually every new major natural resource project in Canada but there is no formal requirement for the magnitude of benefits that must be paid to a community. Therefore, project developers must decide what magnitude of costs they are willing to incur when providing CBA offers to communities. Figure 4.1 presents a

simplified decision tree that outlines a project developer's option of whether to provide a consent-seeking CBA offer (i.e., one with benefits that are perceived by the community as equitable and will result in consent from the community) or a notional CBA offer (i.e., one with benefits that satisfy legal consultation and accommodation requirements but will not result in consent from the community). The cost of the CBA (Y) includes all costs that can be directly attributed to the CBA and that would not be imposed on the developer in its absence.



Where:

X is project NPV (profit);

Y is the cost of the CBA, with Y_1 for a consent-seeking CBA and Y_2 for a notional CBA;

C is cost of conflict;¹⁵ and

q is the probability of no conflict.¹⁶

Figure 4.1 Project developer decision tree for CBAs¹⁷

The decision tree includes three possible outcomes. The project net present value (NPV) (X), which is referenced in all possible outcomes, is an estimate of the present value of all future cash flows (i.e., gross revenue less capital expenditures,

¹⁵ The cost of conflict includes any CBA costs above Y_2 that are required to reach agreement.

¹⁶ The probabilities of conflict and no conflict are conditional on a notional offer.

¹⁷ The project developer decision tree for CBAs is inspired by a decision tree that focused on the community's decision to negotiate CBAs that was included in an earlier circulated, but unpublished, version of Adebayo & Werker (2021).

operating expenditures, taxes, payments to other stakeholders, etc.) and indicates the economic viability of a project. If the project developer provides a consent-seeking CBA offer, the NPV of the project is reduced by the cost of the consent-seeking CBA ($X - Y_1$). If, however, the project developer elects to provide a notional CBA offer, this could result in either no conflict or conflict. In the no conflict outcome, which has a probability of q , the project NPV is reduced by the cost of the notional CBA ($X - Y_2$). In the conflict outcome, which has a probability of $1 - q$, the NPV of the project is reduced by the cost of the conflict and the notional CBA ($X - (C + Y_2)$).

Conflict surrounding natural resource projects is ubiquitous and is especially prominent in the mining sector (Scheidel et al., 2020). Recent examples of conflict surrounding natural resource projects in Canada such as the protests and blockades of the Coastal GasLink Pipeline illustrate how the costs of conflict can negatively affect project developers, Indigenous communities, and senior levels of government (Forester, 2023). Conflict may result in delayed operations, lost productivity, theft or damage of infrastructure, or increased transaction costs to resolve the conflict (R. Davis & Franks, 2014; Franks et al., 2014; Scheidel et al., 2020). A community’s bargaining power—which is likely to be higher for communities with strong property rights, history of institutional action, and history of political mobilization—and the predicted level of adverse impacts are likely to influence the probability of conflict, the cost of conflict, and the cost of the CBA (Dorobantu & Odziemkowska, 2017; O’Faircheallaigh, 2016, 2021). In terms of the decision tree, increased bargaining power and/or increased expected adverse impacts are likely to increase the cost of the CBA (Y), the probability of conflict ($1 - q$), and the cost of conflict (C).

Table 4.1 CBA decision making through alternative theoretical lenses

Project developer’s decision rule	Shareholder theory	Stakeholder theory
Provide consent-seeking CBA offer if...	$Y_1 < (1 - q)C + Y_2$ ¹⁸	$Y_1 < X$
Provide notional CBA offer if...	$Y_1 > (1 - q)C + Y_2$	—
Project is likely considered non-viable if...	$X - Y_2 < 0$	$Y_1 > X$

¹⁸ This equation assumes that the project developer is risk neutral and does not use weighting to adjust either option.

A project developer's decision on whether to provide a consent-seeking CBA offer or a notional CBA offer will depend on the project developer's objectives. In theory, private project developers aim to maximize economic profits and only undertake projects that are estimated to have positive NPVs (Barney, 2018). Resource-based theory posits that private firms seek to generate profits through possessing resources that are rare, inimitable, and non-substitutable (Barney, 2018; Salmon, 2023). Within resource-based theory are two theories, shareholder theory and stakeholder theory, with contrasting perspectives on project developers' objectives concerning economic rent distribution (Barney, 2018). Shareholder theory posits that private project developers have the responsibility to maximize returns for shareholders (Barney, 2018; Dorobantu & Odziemkowska, 2017; Freeman, 2010; Garcia-Castro & Aguilera, 2015; Odziemkowska & Dorobantu, 2021; Salmon, 2023). When applied to the decision tree, shareholder theory suggests that a project developer would make a consent-seeking CBA offer if the value of the project with a consent-seeking CBA is higher than the expected value of the project with a notional CBA (i.e., if $X - Y_1 > q(X - Y_2) + (1 - q)(X - (C + Y_2))$). As seen in Table 4.1, this equation is simplified to the decision rule $Y_1 < (1 - q)C + Y_2$, indicating that a project developer will provide a consent-seeking CBA offer if the cost of the consent-seeking CBA is less than the expected value of the cost of conflict plus the cost of the notional CBA.

Stakeholder theory posits that project developers are accountable to all parties affected by a project (Barney, 2018; Dorobantu & Odziemkowska, 2017; Freeman, 2010; Henisz et al., 2014; Odziemkowska & Dorobantu, 2021; Prno & Slocombe, 2012). According to stakeholder theory, project developers must negotiate agreements with communities for natural resource projects that are site-specific and that have the potential for negative externalities (Dorobantu & Odziemkowska, 2017; Odziemkowska & Dorobantu, 2021; Prno & Slocombe, 2012; Salmon, 2023; Williamson, 1985). In the context of stakeholder theory, CBAs are necessary to make projects incentive compatible for all stakeholders (Dorobantu & Odziemkowska, 2017; MacPhail et al., 2023). Consequently, stakeholder theory suggests that the project developer will never elect to provide a notional CBA offer. As seen in Table 4.1, a stakeholder theory lens suggests that the project developer will elect to provide a consent-seeking CBA offer on the condition that the project is economically viable with the consent-seeking CBA ($X - Y_1 > 0$), suggesting the following decision rule: $Y_1 < X$.

Through a case study analysis, this study seeks to estimate the cost of a consent-seeking CBA for a project developer (Y_1). We then compare this cost relative to: (i) the project's total after-tax cash costs, indicating its economic magnitude; (ii) the estimated NPV and internal rate of return (IRR) of a project (X), indicating its impact on economic viability; and (iii) a hypothetical cost of conflict (C), which determines a shareholder-motivated project developer's decision to make a consent-seeking CBA offer or a notional CBA offer.

4.3. Benefit-cost analysis theory

This study relies on theory and principles associated with benefit-cost analysis, which involves estimating the net impacts of alternative projects or policies from the perspective of society as a whole (Boardman et al., 2017; Hanley, 2001; Pearce, 1998; Pearce et al., 2006). A key principle of benefit-cost analysis is that estimating the net impact of a project or policy must include a comparison between the proposed intervention and the baseline, indicating the incremental benefit or cost (i.e., comparing between scenarios with and without the project or policy) (Boardman et al., 2017; Shaffer, 2010). This principle is applicable to this study in that a crucial distinction must be made between which CBA costs are incremental and which are not. The key question in determining if a cost is incremental is whether it is likely to occur in the absence of a project or policy (Gillespie & Bennett, 2015; T. Gunton et al., 2020; Shaffer, 2010; Winter et al., 2021). In the context of this study, incremental costs of a CBA refer to those that can be directly attributed to the CBA and that would not be imposed on the project developer in the absence of the CBA. It is possible that some aspects of a CBA may also generate incremental benefits by reducing costs, thereby reducing the total incremental cost of the CBA.

4.4. Case Study Analysis

4.4.1. Methodology

In our case study analysis, we estimate the incremental cost of a CBA for a project developer over the lifetime of a project. We believe that the Mary River IIBA represents a pragmatic case study topic because the benefits provided by the IIBA appear to be on the high end of absolute CBA benefits for communities (Adebayo & Werker, 2021;

Loxley, 2019) and is therefore likely to be on the high end of absolute costs for project developers. Consequently, we believe that the Mary River IIBA is a conservative case study in that the IIBA is likely to have a higher cost and a greater impact on project viability compared to other CBAs. The Qikiqtani Inuit Association (QIA), the organization that negotiated the IIBA, has relatively strong bargaining power compared to other communities that have negotiated CBAs in Canada due to QIA's proven and recognized rights and title, further supporting the assumption that the absolute costs of the IIBA are higher than other CBAs. Another key factor in selecting the Mary River IIBA as a case study topic is that much of the information that is necessary for this study's analysis is publicly available. The details of CBAs are often kept confidential (Agbaitoro, 2018; Alcantara & Morden, 2019; Fidler & Hitch, 2007; G. Gibson & O'Faircheallaigh, 2010; Hira & Busumtwi-Sam, 2018; Howard-Wagner, 2010), so the fact that the Mary River IIBA is publicly available, along with much of the information required for the analysis, makes this a pragmatic case study topic.

For our case study analysis, we use a discounted cash flow model to estimate the NPV and the IRR of the after-tax revenue of the mine under three scenarios: one that includes the consent-seeking IIBA (and no conflict), one that includes conflict (and a notional IIBA), and a counterfactual scenario that includes a notional IIBA and no conflict. For the purpose of this study, we assume that the Mary River IIBA is a consent-seeking CBA due to QIA's relatively high bargaining power and due to the IIBA achieving consent at the time it was negotiated. We estimate the incremental cost of the IIBA and the hypothetical cost of conflict by comparing the respective scenarios to the counterfactual scenario. We use a real (inflation-adjusted) discount rate of 8%, a rate that is common for assessing the economic viability of private mine projects and was used in other financial analyses of the Mary River Mine (Baffinland Iron Mines Corporation, 2018b; Loxley, 2019; West & Lépez, 2021). Also, when estimating the NPV of the project's after-tax revenue, we assume that the project is unlevered (i.e., financed with 100% equity) which likely results in a lower NPV estimate than if the project was funded with a mix of debt and equity, further indicating that our estimates are relatively conservative and represent the high end of CBA costs in terms of impact on economic viability. We also conduct a sensitivity analysis utilizing alternative iron ore prices and include the results in Appendix D.

As discussed, a notional CBA offer is one that satisfies the legal consultation and accommodation requirements but does not result in a community providing consent. It is possible that some payments would be made to a community above those required to satisfy legal consultation and accommodation obligations due to expectations and precedent surrounding corporate social responsibility (Adebayo & Werker, 2021). However, in our analysis, we conservatively assume that any benefits provided by a notional IIBA are ones that would still be required in the absence of the IIBA (e.g., through the impact assessment process) or ones that do not generate incremental costs to the project developer. Therefore, in our analysis, we assume that the incremental cost of a notional IIBA is zero. This assumption further supports our belief that this case study represents the upper bound of CBA costs for project developers.

We base our assumptions and inputs for the case study analysis on information obtained from publicly available sources that indicate the realized outcomes of the IIBA including socio-economic reports for the Mary River project (Baffinland Iron Mines Corporation, 2020, 2021, 2022, 2023; Prno, 2017, 2018, 2019), the Mary River IIBA document (Qikiqtani Inuit Association & Baffinland Iron Mines Corporation, 2018), QIA annual reports (Qikiqtani Inuit Association, 2016, 2017, 2018, 2019, 2020, 2021, 2022), the project certificate issued by the Nunavut Impact and Review Board (NIRB) (Nunavut Impact Review Board, 2014a), the Nunavut Land Claim Agreement (NLCA) (Indian and Northern Affairs Canada, 2018), research reports (Beach, 2003; R. Davis & Franks, 2014; Impact Economics, 2021; Loxley, 2019; West & Lépez, 2021; Winter et al., 2021), and academic literature (Adebayo & Werker, 2021). As part of the case study analysis, we review and evaluate the provisions of the IIBA using benefit-cost analysis principles to identify which provisions are likely to generate incremental costs for Baffinland. We then use the results of this evaluation to inform the assumptions used to estimate the incremental costs of the IIBA. Additionally, we utilize information on the realized outcomes of the IIBA (up to 2022) from the sources listed above to inform some of the assumptions and inputs used in the discounted cash flow analysis including the costs to Baffinland associated with employment and training, local procurement, IIBA implementation, and the Ilagiiktunut Community Wellness Fund. The full list of inputs and assumptions can be found in Appendix D.

4.4.2. Case context: Mary River Iron Mine and Inuit Impact and Benefit Agreement

The Mary River Mine is an open pit iron ore operation located on Baffin Island, Nunavut, Canada. The mine produces high-grade iron ore at approximately 67% iron content and is shipped to international markets (Mining Technology, 2015). Baffinland initially received approval for the mine from the NIRB in 2012 for a production of 18 million tons per annum (MTA) (Loxley, 2019; Mining Technology, 2015). The original plan for the mine was to transport ore via rail to a port located in Steensby Inlet, south of the mine site. In 2014, Baffinland submitted an application for an “early revenue phase” with a production of up to 4.2 million MTA, proposing to use trucks to transport ore to a port located north of the mine site in Milne Inlet (Loxley, 2019; Mining Technology, 2015). Baffinland received approval for the early revenue phase and began shipping ore from the mine in 2015, approximately two years after construction began (Loxley, 2019; Mining Technology, 2015). Currently, the Mary River mine operates at a production of approximately 6 MTA and has been doing so since 2018 under a temporary “sustaining operations” approval (Loxley, 2019; West & Lépez, 2021).

Baffinland negotiated an IIBA with the QIA in 2013. The QIA represents 13 communities and approximately 16,000 Inuit residents located in the Qikiqtani region of Nunavut (Qikiqtani Inuit Association, 2023). The Qikiqtani Inuit, represented by the QIA, have proven Indigenous rights and title to their territory as defined by the NLCA (Indian and Northern Affairs Canada, 2018). The NLCA requires project proponents to negotiate IIBAs with the relevant Inuit organization, which in the case of the Mary River Mine is the QIA (Indian and Northern Affairs Canada, 2018). This is an important distinction from CBAs negotiated elsewhere in Canada, as the regions in which Inuit have surface rights and subsurface rights are clearly defined by the NLCA, giving QIA relatively strong bargaining power for CBA negotiations compared to other Indigenous groups in Canada.

As stated in Article 26.3.3 of the NLCA, IIBA payments to Inuit communities are not intended to impose an “excessive burden on the proponent and undermine the viability of the project” (Indian and Northern Affairs Canada, 2018, p.197). What constitutes an “excessive burden” on the economic viability of a project is not explicitly defined in the NLCA. Conceivably, one might consider an IIBA to have an excessive financial burden if the IIBA results in the project being economically unviable based on

two common indicators: NPV and IRR. A project is considered economically viable if its estimated NPV is non-negative, assuming an appropriate developer discount rate, and/or if its estimated IRR is higher than an appropriate discount rate (De Marco, 2018).

The Mary River IIBA contains provisions that are intended to generate benefits for the QIA including royalty payments, advance payments, Inuit employment and training, Inuit procurement, implementation funding, and contributions to the Ilaqiktunut community wellness fund. The IIBA was amended in 2018 with the objective of increasing Inuit training and employment benefits. A second agreement, the Inuit Certainty Agreement, was negotiated in 2020 and was intended to be implemented in conjunction with Baffinland's proposed mine expansion. In 2018, Baffinland submitted an application for the "Phase 2" expansion which proposed an increase in production of up to 12 MTA and the development of a railway connecting the mine site to the Milne Inlet port. The Phase 2 expansion was rejected by the NIRB and the federal government in 2022 due to concerns that the expansion would result in significant adverse impacts to the environment (Nunavut Impact Review Board, 2022). Most of the Inuit Certainty Agreement provisions no longer apply due to the rejection of Phase 2 (Qikiqtani Inuit Association & Baffinland Iron Mines Corporation, 2020).

4.4.3. Incremental vs non-incremental costs of the IIBA

As discussed, benefit-cost analysis principles outline the need to distinguish between incremental and non-incremental benefits and costs when estimating the consequences of a project (Gillespie & Bennett, 2015; T. Gunton et al., 2020; Shaffer, 2010; Winter et al., 2021). Generally, the provisions of CBAs that have the potential to generate costs for project developers include those relating to revenue sharing (including royalties and/or milestone payments), local employment, local procurement, adverse impact mitigation and monitoring measures, and CBA implementation funding. Below, in Table 4.2 and in the subsequent text, we evaluate which provisions of the IIBA are likely to generate incremental costs for Baffinland. We then use the results of our evaluation to inform the assumptions and model inputs used to estimate the incremental cost of the IIBA for Baffinland. A general assumption that we make regarding these provisions is that direct IIBA expenditures—including royalty payments, advance payments, infrastructure payments, business capacity fund payments, and Ilaqiktunut Community Wellness Fund

payments—are tax deductible and the costs associated with these provisions are offset to some degree by lower corporate income tax (CIT) payments.

Table 4.2. Summary of Mary River IIBA provisions and cost evaluations

IIBA Provision	Evaluation
Royalty payments	Incremental cost
Advance payments	Incremental cost
Infrastructure payments	Incremental cost
Inuit employment	
• Inuit job turnover	Incremental cost
• Inuit training and education	Incremental cost
• Local employment versus fly-in fly-out employment	Incremental benefit (reduces incremental cost)
Inuit procurement	
• Contracts	Non-incremental cost
• Business capacity fund	Incremental cost
Ilagiiktunut Community Wellness Fund	Incremental cost
Wildlife compensation and monitoring	Non-incremental cost
Tax deductibility of direct IIBA payments (For federal and territorial CIT)	Incremental benefit (reduces incremental cost)

Royalty payments

The Mary River IIBA royalty payments are based on the revenue of the Mary River Mine (1.19% of net sales revenue). These payments would not be made by Baffinland in the absence of the IIBA and therefore we assume that they generate an incremental cost for Baffinland.

Advance payments

The IIBA outlines various milestone fixed payments that Baffinland is required to pay to QIA. These payments would not be made by Baffinland in the absence of the IIBA and therefore we assume that they generate an incremental cost for Baffinland.

IIBA implementation payments

Baffinland is required to make annual IIBA implementation payments to QIA to support management of the IIBA including operating costs of the various committees and salaries for QIA employees. These are direct costs that are required to operationalize the IIBA and therefore we assume that they generate an incremental cost for Baffinland.

Infrastructure payments

In the revised IIBA (2018), Baffinland commits \$10 million towards developing a regional training centre in Pond Inlet. In the absence of the IIBA, it is unlikely that this project would be funded by Baffinland and therefore we assume that this payment generates an incremental cost for Baffinland.

Inuit employment

When estimating the incremental cost of the IIBA's Inuit employment provisions, the cost of Inuit employees must be compared to the cost of non-Inuit employees that would replace the Inuit employees. That cost is a function of the relative costs between the two groups from turnover, training, and transportation to the mine site.

Inuit turnover: The average annual turnover rate for Inuit project employees has been marginally higher than the average turnover of non-Inuit employees from 2013 to 2022 (30% vs 25%, respectively) (Baffinland Iron Mines Corporation, 2020, 2021, 2022, 2023; Prno, 2017, 2018, 2019). For unskilled and semi-skilled mining jobs, we assume that the cost of turnover is approximately 30% of the salary for each position being replaced, which accounts for separation costs, recruitment costs, training costs, and lower productivity of new workers (Beach, 2003).

Inuit training: Inuit workers employed by the mine receive more training than non-Inuit workers per full-time equivalent (FTE). In the original IIBA, Baffinland commits to providing \$2 million upfront (in the first two years following negotiations) and \$250,000 annually for Inuit training programs. This was revised in the 2018 renegotiation, in which Baffinland commits to providing \$2 million per year from 2018-2021 and \$1.5 million annually from 2021 to 2031. In the absence of the IIBA, we assume that the non-Inuit replacement workers would still receive training, an estimated average of 42% of the amount of training received by Inuit workers (per FTE), based on information available in Baffinland's socio-economic reports.

Fly-in fly-out (FIFO) workers: In the absence of the IIBA, we assume that replacement workers would come from elsewhere in Canada and would require additional flights (paid for by Baffinland) to and from Iqaluit. Currently, FIFO workers take commercial flights to and from Montreal and the flights between Montreal and Iqaluit are privately chartered by Baffinland. Additional costs associated with more FIFO workers, such as hotel and

food expenses en route, are excluded as we assume that these would be approximately offset by the additional cost of regional flights (over and above the cost of flights from Iqaluit) for Inuit workers to and from the mine.

Inuit procurement

We assume that the only provision related to Inuit procurement that generates an incremental cost is the business capacity fund. Baffinland makes annual contributions to the fund, which is managed by the QIA. Although the IIBA outlines obligations concerning the provision of contracts to Inuit-owned businesses, nothing in the IIBA requires that Inuit-owned businesses would be paid more than other contractors (e.g., a provision that requires Inuit bids to be favoured up to 5% or 10% above the value of the lowest bid by another contractor). In situations where no Inuit-owned businesses express interest in a given contract or if negotiations are unsuccessful (e.g., if Baffinland believes that it is unable to get fair value based on bids from Inuit-owned businesses), Baffinland can tender contracts through a competitive bid process (Qikiqtani Inuit Association & Baffinland Iron Mines Corporation, 2018). While contractors that commit to maximizing Inuit benefits are favoured in the bidding process, we have not modelled this as an incremental cost to Baffinland.

Ilagiiktunut Community Wellness Fund

The Ilagiiktunut Community Wellness Fund is intended to build community capacity and promote community wellbeing over the lifetime of the mine. In the IIBA, Baffinland commits to matching payments to this fund made by QIA (up to \$375,000 from 2013 to 2018 and up to \$550,000 from 2019 onwards). We assume that these payments would not be made by Baffinland in the absence of the IIBA and therefore we consider the payments to be an incremental cost.

Wildlife compensation and monitoring

In the Mary River IIBA, Baffinland commits to making various payments related to wildlife compensation and monitoring, including funding the Wildlife Compensation Fund, funding the Harvesters Enabling Program, funding the Wildlife Monitoring Program, and purchasing marine research equipment. While these payments are outlined as provisions in the IIBA, compensation for wildlife loss and provision of monitoring activities are required by the project certificate issued by the NIRB and by the NLCA. We

assume that even in the absence of the IIBA these payments would likely still be required of Baffinland by the NIRB project certificate and the NLCA and therefore funding for wildlife compensation and monitoring is not considered an incremental cost of the IIBA. Also, concerning the Wildlife Monitoring Program, we assume that monitoring activities undertaken by local communities would substitute for monitoring activities that Baffinland would be required to conduct in the absence of the IIBA.

4.4.4. Realized costs of the Mary River IIBA (2013-2022)

We estimate the realized outcomes of the IIBA from 2013 to 2022 using information from Baffinland's publicly available socio-economic reports and impact assessment application documents (Table 4.3). These estimates inform some of the assumptions and inputs of this study's discounted cash flow analysis in which we estimate the costs of the IIBA to Baffinland over the lifetime of the mine. Our estimates are divided into two time periods to account for the increase in production and the revision of the IIBA, both of which occurred in 2018. In addition to the estimates presented in the table, Baffinland provided a total of \$37,421,000 (2023 CAD) in advance payments to QIA. These payments were made upfront during the construction phase and therefore are not included as annual averages in Table 4.3.

Our estimates of the realized outcomes of the IIBA indicate that there are incremental costs to Baffinland associated with royalty payments, advance payments, and Inuit procurement (business capacity fund). Additionally, our estimates indicate that there is an incremental benefit to Baffinland due to cost savings associated with employing Inuit workers, as replacing these workers with FIFO workers (from elsewhere in Canada) would result in higher overall costs to Baffinland due to the high cost of transporting workers to the mine site, even when accounting for the higher turnover costs and training costs associated with Inuit labour. Since this study only focuses on the cost of a CBA to a project developer, the only potential sources of incremental benefits in the analysis are CBA provisions that result in cost savings. Conceivably, negotiating a CBA can benefit a project developer in other ways including creating a competitive advantage, improving reputation and legitimacy, increasing share prices, and increasing the magnitude of benefits generated and distributed by a project (Dorobantu &

Odziemkowska, 2017; Kurucz et al., 2008; Prno & Slocombe, 2012). These benefits, however, are not estimated in this study.

Table 4.3. Realized outcomes of Mary River IIBA (2013-2022)

Provision	Average Annual (2013-2017) (2023 CAD)	Average Annual (2018-2022) (2023 CAD)
Mine production	4.2 MTA	6 MTA
Royalty payments	\$1,968,699	\$9,607,209
Inuit employees (actual, Baffinland- excluding contractors)	92 (FTE)	166 (FTE)
Total employees (actual, Baffinland- excluding contractors)	561 (FTE)	1,098 (FTE)
Incremental cost of Inuit employment (per Inuit FTE)	-\$19,970	-\$17,255
Incremental cost of Inuit employment (total)	-\$1,835,062	-\$2,867,757
Incremental cost of Inuit procurement (business capacity fund)	\$320,000	\$320,000
Incremental cost of IIBA implementation	\$862,631	\$2,652,828
Incremental cost of Ilagijiktunut Community Wellness Fund	\$243,271	\$455,274

4.4.5. Incremental Cost of the Mary River IIBA to Baffinland (2013-2038)

We estimate the incremental cost of the Mary River IIBA over the lifetime of the mine, estimate the impact of the IIBA on the economic viability of the mine, and compare the cost relative to the mine’s total after-tax cash costs and relative to a hypothetical cost of conflict that could occur if a consent-seeking CBA offer was not provided. Table 4.4 outlines the three scenarios evaluated in this analysis, all of which are represented in the decision tree presented in Figure 4.1, above. The model inputs used in the analysis are provided in Appendix D. As discussed, we assume that the incremental cost of a notional IIBA is zero because the benefits it provides would be necessary for project approval. This analysis utilizes a simple hypothetical scenario of delaying the profits of the project by one year, for the purpose of modeling the cost of conflict and comparing it to the incremental costs of the IIBA. Of course, delays can occur for a variety of reasons, including many that have nothing to do with signing a CBA, and can result in a range of costs not modelled in this study.

Table 4.4. Case Study Analysis Scenarios

	Notional IIBA	Consent-seeking IIBA
No conflict	Counterfactual Scenario: Notional IIBA is provided and there is no conflict.	Scenario 1: Consent-seeking IIBA is negotiated and there is no conflict.
Conflict	<p>Scenario 2: Notional IIBA is provided and there is conflict.</p> <p>2a: Delay occurs prior to construction.</p> <p>2b: Delay occurs mid-construction.</p>	

Incremental cost of Mary River IIBA

The incremental cost of the Mary River IIBA is estimated to have a present value in 2023 dollars of \$95 million (at a real discount rate of 8%), a cost which represents just over 2% of the mine’s total after-tax cash costs which we estimate to be approximately \$4.5 billion. A breakdown of the costs of the Mary River IIBA is presented in Table 4.5. The highest cost provisions of the IIBA are royalty payments, advance payments, and implementation payments. The incremental cost of procurement is relatively small since it only includes the cost associated with the business capacity fund, as contracts awarded to Inuit-owned businesses are assumed not to be any more costly than contracts with non-Inuit businesses and therefore do not generate incremental costs for Baffinland. Interestingly, there is an incremental benefit from the cost savings associated with Inuit employment due to the cost of FIFO workers being higher than the cost of Inuit workers. The incremental cost of the IIBA is further decreased by the tax deductibility of direct IIBA expenditures, resulting in a decrease of \$28 million for federal and territorial CIT payments.

Table 4.5. Breakdown of costs of Mary River IIBA

Provision	Cost
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	(Millions of 2023 CAD)
Royalty	\$66
Advance payments	\$49
Infrastructure payments	\$7
Employment	-\$26
Procurement	\$4
IIBA Implementation	\$20
Ilagiiktunut Community Wellness Fund	\$4
<i>Decrease in CIT expenses</i>	-\$28
IIBA Cost	\$95¹⁹
Total project cash costs (after tax)	\$4,554

Cost of Mary River IIBA relative to economic viability of project and relative to cost of conflict

The incremental cost of the Mary River IIBA is evaluated relative to the mine’s economic viability, which is indicated by the NPV and IRR of the after-tax returns of the mine in the counterfactual scenario. The cost of the Mary River IIBA decreases the project NPV, which is estimated to be approximately \$1.3 billion, by \$95 million and decreases the project IRR, which is estimated to be 22.7%, by 1.4 percentage points. The 22.7% IRR that we estimated for the mine is higher than the discount rates used by Baffinland for its financial analyses, which are 7%, 8%, and 10% (Baffinland Iron Mines Corporation, 2018b). Comparing the incremental cost of the Mary River IIBA to the NPV of the mine and to Baffinland’s discount rates for the mine, the results indicate that the cost of the IIBA has a relatively marginal impact on the economic viability of the mine.

The incremental cost of the Mary River IIBA is also evaluated relative to the cost of conflict, which is represented in the analysis by a delay in operations. The results indicate that the incremental cost of a single year of delay is higher than the incremental cost of the IIBA. For a delay that occurs prior to construction, the project NPV is decreased by \$102 million and the IRR is decreased by 0.5 percentage points, per year of delay. If the delay occurs mid-construction, the project NPV is decreased by \$135 million and the IRR is decreased by 2.4 percentage points, per year of delay. A delay

¹⁹ Individual costs do not equal total CBA cost when added up due to rounding.

that occurs mid-construction has a higher cost than a delay that occurs prior to construction due to the earlier capital expenditures.

Table 4.6. Cost of Mary River IIBA relative to economic viability of project and relative to cost of conflict

Scenario (decision tree variable)		(Millions of 2023 CAD)
Counterfactual ($X - Y_2$) (Notional IIBA, no conflict)	After-tax revenue NPV	\$1,294
	After-tax revenue IRR	22.7%
1. Incremental cost of consent-seeking IIBA (Y_1)	Cost (present value)	\$95
	IRR impact (Percentage points)	-1.4%
2a. Cost of delay prior to construction (C per year)	Cost (present value)	\$102
	IRR impact (Percentage points)	-0.5% ²⁰
2b. Cost of delay mid-construction (C per year)	Cost (present value)	\$135
	IRR impact (Percentage points)	-2.4%

4.5. Discussion

The results of the case study analysis provide some important insights concerning a project developer's decision regarding a CBA offer. As discussed, shareholder theory and stakeholder theory have different interpretations of project developers' objectives regarding CBAs and benefit distribution. Stakeholder theory recognizes that CBAs must be negotiated with Indigenous communities to gain access to resources, which is integral to generating profits. Therefore, in terms of the decision tree, stakeholder theory suggests that a project developer will negotiate a CBA if the cost of the consent-seeking CBA (Y_1) is less than the NPV of the project without the CBA (X), which is estimated to be approximately \$1,294 million (Table 4.7). The results of the analysis indicate that the stakeholder theory decision rule is met and would still be met if the cost of the IIBA was increased significantly up to the NPV of the mine.

²⁰ A delay that occurs prior to construction has a relatively minimal impact on project IRR compared to a delay that occurs mid-construction since a minimal amount of capital is invested at the time the delay occurs. A delay that occurs prior to construction, however, has a significant impact on the project's NPV due to project revenues being delayed by one year.

Table 4.7. Case study results applied to CBA negotiation theory

	Shareholder theory	Stakeholder theory
Decision rule: Offer consent-seeking CBA if...	$Y_1 < (1 - q)C + Y_2$	$Y_1 < X$
Case study results (Millions of 2023 CAD)	$\$95 < (1 - q)\$102 \times \text{number of years}^{21}$ Or $\$95 < (1 - q)\$135 \times \text{number of years}^{21}$	$\$95 < \$1,294$

Shareholder theory, on the other hand, suggests that the project developer offers a consent-seeking CBA if it provides a net benefit to project NPV, that is if the cost of the consent-seeking CBA (Y_1) is lower than the expected value of the cost of conflict $((1 - q)C)$ plus the cost of a notional CBA offer (Y_2) (Table 4.7). While not all variables were estimated in the case study, some insights can still be distilled from the results. The results indicate that the incremental cost of the IIBA is of the same order of magnitude as the cost of a certain one-year delay. If we assumed that the probability of conflict was 100% if a consent-seeking IIBA offer was not provided by Baffinland, which is a reasonable assumption given that IIBAs are legally required in Nunavut, then the costs of conflict that we estimated, \$102 million and \$135 million (depending on the type of delay), would represent the expected values of the costs of each year of conflict. Under this assumption, the results would indicate that the incremental cost of the IIBA is less than the expected value of the cost of conflict, indicating that the shareholder theory decision rule is also met. The cost of conflict that was estimated in the case study, however, is not necessarily representative of the full cost of conflict. For example, a cost that this analysis does not explicitly consider is the opportunity cost if the mine is not developed. Theoretically, if the Mary River Mine was not developed due to conflict, then the cost of conflict would be \$1.3 billion, the NPV of the mine, which is an exorbitant cost relative to the cost of the IIBA.

When analyzing Baffinland’s costs associated with the IIBA, the results of this study emphasize the importance of distinguishing between incremental and non-incremental costs. Interestingly, provisions relating to employment and local

²¹ The NPV of the cost of the delay per year will decrease the longer the delay occurs due to discounting. The equation is presented in a simplified manner for illustrative purposes.

procurement, which are often key components of CBAs, do not appear to impose significant incremental costs on the project developer. In fact, the results of the case study show that there is potential for an incremental benefit to project developers in the form of cost savings from hiring local labour. This finding suggests that employment, training, and local procurement provisions are in essence the “low-hanging fruit” of CBAs. Recognizing which CBA provisions are associated with incremental costs and which are not can help project developers and Indigenous communities identify overlapping objectives, such as low costs for project developers and high benefits for communities, and potentially enable both groups to allocate time and resources more efficiently during the negotiation process.

4.6. Conclusion

The objectives of this study were to estimate the cost of a CBA for a project developer, estimate the impact of a CBA on the economic viability of a project, and evaluate the cost of a CBA relative to total project cash costs and relative to the cost of conflict. To address these objectives, we conducted a case study analysis of the Mary River Iron Mine and the Mary River IIBA. The results of the analysis revealed that while the provisions relating to payments to QIA result in incremental costs to Baffinland, the local procurement provision results in a minimal incremental cost, the wildlife compensation and monitoring provisions result in no incremental costs, and the Inuit employment provision results in an incremental benefit for Baffinland. The results also revealed that the incremental cost of the Mary River IIBA for Baffinland has a present value of approximately \$95 million in 2023 dollars, which is a relatively low cost compared to the mine’s total after-tax cash costs of \$4.5 billion and to the project NPV of \$1.3 billion. Regarding the impact of the IIBA, the results indicated that the IIBA has a relatively marginal impact on the economic viability of the mine, reducing the project NPV by \$95 million and reducing project IRR by 1.4 percentage points from a projected IRR of 22.7%. Additionally, the results indicated that the cost of the IIBA is lower than the cost of a one year delay in project operations, which has a cost of approximately \$102 million per year for a delay that occurs prior to construction and \$135 million for a delay that occurs mid-construction. The results of the study suggest that negotiating an equitable CBA is likely to be in the financial interest of project developers, even if a more stringent theory of rent distribution, shareholder theory, is utilized. This study has important

implications for project developers, Indigenous communities, and senior levels of government involved in the negotiation and regulation of CBAs.

Chapter 5. Conclusions

The focus of this thesis is on two policy mechanisms related to natural resource governance; the first of these is CBAs. In Chapter 2, I present a paper that explores the role of CBAs in natural resource governance and community development by conducting a systematic review of CBA literature and conducting a thematic coding analysis. The results of the literature review and coding analysis help identify two overarching frames present within CBA literature as well as themes within these frames that provide more specificity as to the role of CBAs. First, CBAs are framed in the literature as instruments that reinforce and legitimize the status quo of natural resource governance. Within this frame, CBAs are characterized as instruments that perpetuate unequal power dynamics between communities, project developers, and senior levels of government; perpetuate injustices and/or disagreements within or between communities, enable senior levels of government to abdicate responsibilities to provide services to communities, and undermine the roles of other policy mechanisms. Second, CBAs are framed in the literature as instruments that facilitate sustainable community development. Within this frame, CBAs are characterized as instruments that facilitate economic and social development in remote communities, restructure power dynamics and allow communities to assert sovereignty, remain durable policy instruments in the long term, mitigate the adverse impacts of natural resource development, establish new partnerships, and reduce conflict between communities, project developers, and/or senior levels of government. The frequency with which these two frames appear in the literature is relatively equal, indicating a lack of consensus regarding whether CBAs are beneficial or harmful to the communities that negotiate them.

In Chapter 3, I present a paper that evaluates the strengths and weaknesses of alternative methods for assessing whether proposed projects are in the public interest including qualitative impact characterization, EconIA, BCA, sustainability assessment, and MAE. The results of the evaluation indicate that MAE overcomes many of the critical limitations of the other methods. I then introduce a comprehensive MAE framework, referred to as the Public Interest MAE Framework, that is designed to help analyze the positive and adverse consequences of proposed projects and help inform decision makers determine whether proposed projects are in the public interest. I apply the Public Interest MAE Framework to a case study, the Mary River Iron Mine, to demonstrate how

the MAE framework functions in practice and illustrate the type of information that it is capable of providing to decision makers. Additionally, I conduct a survey with various IA experts, practitioners, and participants to evaluate the Public Interest MAE Framework. The findings of this research indicate that the Public Interest MAE Framework has the potential to better inform public interest determinations in IA and overcome many of the limitations associated with the impact estimation methods that are currently used in IA.

In Chapter 4, I present a paper that provides the first comprehensive analysis on the cost of a CBA for a project developer. I conduct a case study analysis to estimate the incremental cost of a CBA, the Mary River IIBA, for a project developer, Baffinland Iron Mines Corporation, estimate the impact of the IIBA on the economic viability of the Mary River Iron Mine, and evaluate the cost of the IIBA relative to a hypothetical cost of conflict which is represented by a delay in operations. The incremental cost of the IIBA for Baffinland is estimated to be \$95 million (NPV, 2023 CAD), a cost that is relatively low compared to the mine's total after-tax cash costs, estimated to be \$4.5 billion (NPV, 2023 CAD), low compared to the after-tax revenue of the mine, estimated to be \$1.3 billion (NPV, 2023 CAD), and low compared to the cost of a delay in operations, estimated to be approximately \$102 million per year for a delay that occurs prior to construction and \$135 million for a delay that occurs mid-construction. Additionally, the results indicate that the IIBA has a relatively marginal impact on the economic viability of the mine as it reduces Baffinland's after-tax economic profits by \$95 million (NPV, 2023 CAD) and reduces the mine's IRR, which is estimated to be 22.7%, by 1.4 percentage points.

5.1. Limitations of research and future research needs

The research presented in this thesis has a number of limitations that are important to acknowledge as they help put the findings and insights of the three papers into perspective. One limitation of the paper presented in Chapter 2 is that many of the studies included in the literature have limitations. As discussed in the paper, a major limitation of the literature reviewed for this study is that a majority of the studies lack empirical evidence to support assessments on the role of CBAs and whether or not they are beneficial for Indigenous communities. Consequently, by extension, the paper presented in Chapter 2 shares this limitation. The paper presented in Chapter 2, however, is a literature review and its objective is to identify themes in the literature

rather than necessarily make conclusive determinations regarding CBAs. The paper identifies this limitation in the literature and identifies the need for more empirical studies that focus on the role of CBAs and analyze their impact on community development. A second limitation of the paper presented in Chapter 2 is that it does not directly address an overarching question of how natural resource development affects Indigenous community development. This is an important question that should be addressed in conjunction with assessing how CBAs affect Indigenous community development and this topic should receive more academic attention.

One limitation of the paper presented in Chapter 3 is that I only apply the Public Interest MAE framework to a single case study. As discussed in the paper, the purpose of the case study is to demonstrate how the MAE framework functions in practice and illustrate what kind of information it is able to provide to decision makers. Still, it would be beneficial to apply the MAE framework to multiple projects as this could further test the ability of the MAE framework to inform decision makers as well as illustrate the potential of the MAE framework to compare alternative projects. A second, related limitation is that I only compared development and non-development scenarios when assessing the impacts of the project. A more comprehensive study could be conducted to illustrate the ability of the MAE framework to compare alternative project designs, such as the project as originally proposed, the project with mitigation measures, and the project at various production levels. A third limitation of this study is that I only illustrate the ability of the MAE framework to be used for one phase of the IA process: the public interest determination. A future study could evaluate the ability of the Public Interest MAE Framework to support monitoring and enforcement activities (e.g., comparing predicted impacts to realized impacts of the project). Relatedly, there are noted challenges associated with implementing, monitoring, and enforcing CBAs and a future study could evaluate the ability of the MAE Framework to help address these challenges (e.g., estimating the difference between expected and realized CBA benefits). This study could also include an evaluation of the benefits and costs of integrating CBAs into a regulatory framework. Currently, CBAs between Indigenous communities and private developers are required in few jurisdictions and it is important to conduct further research on the role of senior levels of government in CBA negotiations. A fourth limitation of this study is that I do not estimate all impacts in monetary terms, which makes it more challenging to accurately compare trade-offs. A more comprehensive

analysis could use non-market valuation techniques to estimate all impacts in monetary terms to overcome this limitation. The case study analysis, however, still demonstrates the potential of the Public Interest MAE Framework to inform decision makers by using monetary estimates where possible and supplementing these estimates with quantitative and qualitative information where possible.

A limitation of the study presented in Chapter 4 is that I focus on a single case study. As discussed in Chapter 4, I believe that the Mary River IIBA analyzed in this study provides valuable insights regarding the costs of CBAs for project developers. Still, it would be beneficial to conduct this type of analysis for other CBAs. The ability to determine the incremental costs of CBAs for project developers in a more general sense, rather than determining the incremental cost of one CBA for one project developer, would certainly provide more evidence to support the findings of the study. A second limitation of this study is that I only focus on one side of the equation: the project developer's costs. While this is a valuable contribution to CBA literature (addressing a key research gap), it would also be valuable to estimate all the potential benefits of CBAs for project developers aside from project profits—such as increasing project certainty, increasing share prices, attracting new shareholders, and inducing halo effects on other operations—as this type of analysis would provide useful insights that could further help inform CBA negotiations. Additionally, it would be valuable to estimate the benefits and costs of a CBA to the community and compare them to the project developer's benefits and costs, as this type of analysis could provide valuable insights regarding value creation and the potential for CBAs to increase the size of the pie.

5.2. Improving resource development outcomes by improving CBAs and IA

CBAs and IA are important tools for natural resource governance regarding 1) decision making by community leaders and by senior officials in provincial, territorial, and federal governments, and 2) the distribution of benefits and costs of natural resource development projects. The research presented in this thesis makes significant theoretical and practical contributions that have the potential to improve resource development outcomes for all parties. It is critical that community and government decision makers have access to transparent and accurate information, and the research presented in this thesis can contribute to informed decision making in the context of

CBA and IA. Additionally, as suggested in the CBA literature, communities with strong bargaining power are more likely to negotiate CBAs with project developers (Dorobantu & Odziemkowska, 2017; Odziemkowska & Dorobantu, 2021) and more likely to achieve positive outcomes from CBAs (Arenas et al., 2020; O’Faircheallaigh, 2016, 2021; Salmon, 2023). A community’s political and organizational capacity to negotiate CBAs is a major factor that influences a community’s bargaining power, and consequently influences the likelihood of achieving favourable CBA outcomes (Arenas et al., 2020; O’Faircheallaigh, 2016, 2021; Salmon, 2023). The research presented in this thesis has the potential to improve CBA outcomes, especially for Indigenous communities, by providing information and tools that can help increase community capacity to negotiate CBAs and increase community bargaining power.

The paper presented in Chapter 2 provides valuable insights into the strengths, weaknesses, and role of CBAs. As discussed, this chapter fills a critical research gap and, to the best of my knowledge, this is the first paper to date that provides this type of literature review and content analysis with a focus on the positive and negative aspects of CBAs in the context of natural resource governance. Additionally, the paper presents a CBA analytical framework that indicates how CBAs are framed in the literature and provides insights into how CBAs can be improved to ensure that they meet the objectives of Indigenous communities, senior levels of government, and project developers. The information provided in this chapter, especially details regarding the deficiencies of CBAs, can help inform a community’s decision on whether to negotiate a CBA and help inform the design and negotiation of CBAs to ensure that they meet the objectives of Indigenous communities and project developers.

Next, the paper presented in Chapter 3 contributes to IA literature through proposing the Public Interest MAE Framework, which overcomes many of the limitations of the impact estimation methods that are currently used in IA. While the current body of IA literature includes various articles that propose methods that overcome some of the limitations of IA, these articles often focus on a single method that applies to a single aspect of IA. The paper presented in Chapter 3 differs from other papers in this field by proposing a more comprehensive method that incorporates a collection of methods, resulting in a thorough yet concise assessment of the potential consequences of a proposed project. The Public Interest MAE Framework builds on existing MAE

methodology, and, to the best of my knowledge, this is the first study to date to adapt MAE methodology directly to Canada's new IA legislation.

In addition to filling a gap in IA literature, the paper presented in Chapter 3 has the potential to help improve resource development outcomes for Indigenous communities, project developers, senior levels of government, and society as a whole. The Public Interest MAE Framework can be used by IA practitioners and project proponents to ensure that proposed projects are designed to maximize benefits, minimize and mitigate adverse impacts, and ensure benefits and costs are equitably distributed, thus improving natural resource development outcomes for all parties. Additionally, the Indigenous Community MAE Framework that was developed as part of this study (and included in Appendix A) has the potential to support Indigenous communities participating in the IA process and can be used directly by communities to estimate how they may be impacted by a project and assess whether a project is in their interest. The Indigenous Community MAE Framework can also be used by communities to inform CBA negotiations as it can be used to estimate the potential benefits that a CBA may provide to a community and indicate the distribution of benefits amongst parties.

Finally, the paper presented in Chapter 4 contributes to CBA literature through providing important information and insights regarding how CBAs affect project developers. To the best of my knowledge, this is the first study to date to estimate the cost of a CBA for a private project developer and thus fills a critical research gap. This cost is then compared relative to the economic viability of the project and relative to a hypothetical cost of conflict, which helps put the cost of a CBA into context. Additionally, in this paper I discuss how the cost of a CBA and decision rules under two theories related to resource rent distribution, shareholder theory and stakeholder theory, may influence a project developer's decision when offering a CBA to a community. The findings of this study highlight the importance of distinguishing between incremental and non-incremental benefits and costs, as doing so provides a more accurate assessment of the cost of a CBA and may help identify overlapping objectives, such as provisions with low costs to the developer and high benefits to the community, which can help increase the efficiency of negotiations and potentially lead to more equitable distributions of benefits and costs. The findings of this study also indicate that the CBA analyzed in the case study has a relatively low incremental cost for the project developer, suggesting

that there may be an opportunity for project developers to make higher payments to communities while still ensuring that projects are economically viable. These insights have important implications for CBA negotiations and can help ensure that future CBAs meet the objectives of all parties.

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Appendix A.

Indigenous Community MAE Framework

Table A.1 Indigenous Community MAE Framework for the Mary River Mine

Account	Description	Potential sub-accounts and components	Potential Estimation Methods	Indicators
Indigenous Government Revenue	<p>This account measures the fiscal impacts of the proposed project to the Indigenous community's government or administrative body. Revenue benefits can be generated by a community through negotiating a CBA with the project developer and/or negotiating a benefit agreement with a senior level of government, such as an economic and community development agreement.²²</p> <p>The proposed project may also result in revenue costs if community-based economic sectors are affected (e.g., fisheries, forestry, or tourism) and/or net expenditures (e.g., adverse impact mitigation measures</p>	Net Revenue	Discounted Cash Flow Analysis (DCFA)	<p>1) The <i>NPV of First Nation government revenue</i> indicates the net benefit (or cost) of economic impacts to the Indigenous community.</p> <p>2) For resource projects, the <i>% of total rent</i> indicates the proportion of total resource rent that accrues to Indigenous communities. This also indicates the effectiveness of CBA fiscal instruments at collecting rent and generating revenue and can be used to assess the equitability of the CBA in distributing benefits.</p>

²² For more information on the different types of agreements negotiated between Indigenous communities and senior levels of government, see <https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/consulting-with-first-nations/first-nations-negotiations>.

	or adverse impacts on other sectors).			
Economic Activity	<p>This account measures the impact of the proposed project on the community's economic activity. Economic activity impacts include non-revenue benefits and costs to the Indigenous community's economy resulting from the proposed project. Non-revenue economic impacts may include employment, training and education, local business contracts, and local infrastructure.</p>	<p>Employment Training and education Local business Local infrastructure</p>	<p>DCFA EconIA</p>	<p>1) The <i>net contribution to Indigenous community employment</i>, measured in monetary terms as well as total PY during the construction phase and average annual PY during the operations phase, indicates the net employment impacts of a project taking into account employment gains from the project as well as employment losses in other sectors that may be adversely affected by the project and comparing these gains and losses to the current or baseline state of community employment.²³</p> <p>2) The <i>Indigenous community's percentage share of total PY</i> (during construction) and <i>annual average PY</i> (during operations), helps indicate the employment equity of the project.</p> <p>3) The <i>net monetary values</i> of non-market benefits such as training and education, local business contracts, and local infrastructure; which can be estimated based on predicted</p>

²³ It is important to note that employment impacts should only be considered benefits if the community workers would otherwise be unemployed or if they are expected to receive a higher salary compared to their previous employment. Community employment benefits should be estimated using employment benefit methodology from an accepted BCA framework (e.g., Shaffer, 2010) and presented in *monetary units* factoring in the changes in salaries of project employees, the total number of employees, and the employment period.

				costs incurred by the project developer or senior level of government to provide the benefit, indicate the benefit of these provisions to the Indigenous community.
Environmental	This account measures the impact of the proposed project on the community's natural environment. The environmental account aligns with the traditional interpretation of IA, covering impacts to land and resources, water/marine, and air/atmosphere. Any proposed mitigation measures that are intended to help offset adverse impacts will be included in the relevant sub-account.	<p>Land and resources</p> <ul style="list-style-type: none"> • Terrestrial/arbo real species • Land/topography • Private Property • Recreation • Archaeological and heritage sites <p>Water/marine</p> <ul style="list-style-type: none"> • Aquatic species • Hydrology, surface water and groundwater • Recreation <p>Air/Atmosphere</p> <ul style="list-style-type: none"> • Air quality • Greenhouse gas (GHG) emissions 	<p>Environmental Assessment</p> <p>Non-market Valuation</p> <p>Revealed Preference</p> <p>Stated Preference</p> <p>Replacement/offset cost</p> <p>Cumulative Impact Assessment</p> <p>Sustainability Assessment</p>	<p>The environmental, social, and health accounts are likely to include monetary estimates, quantitative/physical unit estimates, and/or qualitative impact characterizations. Non-market valuation methods can be used to estimate environmental, social, and health impacts.²⁴ Non-market valuation methods applied to Indigenous contexts should follow best practices. Indicators for this account will vary from project to project depending on the potential impacts. Indicators of environmental, social, and health impacts will include:</p> <p><i>Monetary units</i> (presented as an NPV);</p> <p><i>Quantitative/physical units</i>; and/or</p> <p><i>Qualitative impact characterizations of impacts using a scale-based rating scheme</i></p>

²⁴ Non-market valuation methods often involve estimating a community's *willingness to pay (WTP)* for benefits provided by a project and *willingness to accept (WTA)*, or compensation demanded, for adverse impacts imposed by a project. Although WTP and WTA are similar in concept, it is important that they not be used interchangeably as they often result in different values. For more information on WTP and WTA see Knetsch (2020).

				(e.g., magnitude, geographic extent, timing, frequency, and duration of the impacts) or other level of measurement such as sustainability targets.
Social	<p>This account measures the impact of the proposed project on the community's social wellbeing. <i>Social wellbeing</i> may be affected by impacts on social practices, systems, and networks that affect community social cohesion or affect community sub-groups. This may include unequal hiring practices or potential for increased violence against women or marginalized groups due to an influx of migrant project workers.</p> <p>Social impacts may instead be incorporated into the health account depending on how a community defines health and whether it includes social wellbeing.</p>	Social wellbeing	<p>Social Impact Assessment GBA Plus Non-market Valuation Revealed Preference Stated Preference Replacement/offset cost</p>	<p>Specific indicators for this account will vary from project to project depending on the potential impacts. Indicators of social impacts are likely to include:</p> <p><i>Monetary estimate in current CAD (NPV)</i> (e.g., estimated cost of additional social service provision);</p> <p><i>Quantitative/physical units</i>; and/or</p> <p><i>Qualitative impact characterizations of impacts using a scale-based rating scheme</i> (e.g., magnitude, geographic extent, timing, frequency, and duration of the impacts) or other level of measurement such as sustainability targets.</p>
Health	<p>This account measures the impact of the proposed project on the community's health. When measuring the</p>	<p>Mental wellbeing Physical wellbeing Cultural and spiritual wellbeing</p>	<p>Health Impact Assessment (HIA) Human Health Risk</p>	<p>Specific indicators for this account will vary from project to project depending on the potential impacts. Indicators of health</p>

	<p>impacts of a project on the health of a community and its members, a comprehensive and holistic view of health should be utilized. It should be emphasized that each component of the health account is interconnected, and a single project-related impact may have a compounding effect on community health.</p> <p>The <i>mental</i> and <i>physical wellbeing</i> of community members may be affected by changes in access to food sources, adequate housing, drinking water, recreational opportunities, etc.</p> <p><i>Cultural</i> and <i>spiritual wellbeing</i> may be affected by impacts on cultural practices, systems, or beliefs that affect cultural cohesion and/or continuity. This includes language and intergenerational transmission of culture and history.</p>		<p>Assessment (HHRA)</p> <p>Non-market Valuation</p> <p>Revealed Preference</p> <p>Stated Preference</p> <p>Replacement/offset cost</p>	<p>impacts are likely to include:</p> <p><i>Monetary estimate in current CAD (NPV) e.g., estimated cost of additional health service provision);</i></p> <p><i>Quantitative/physical units; and/or</i></p> <p><i>Qualitative impact characterizations of impacts using a scale-based rating scheme (e.g., magnitude, geographic extent, timing, frequency, and duration of the impacts) or other level of measurement such as sustainability targets.</i></p>
Governance	<p>This account measures the impacts of the proposed project on the community's governance over its territory and resources. These impacts are broadly categorized as <i>governance-related benefits</i> or</p>	<p>Governance-related benefits</p> <p>Governance-related costs</p> <p>FPIC</p>	<p>Document Analysis</p>	<p>1) <i>Qualitative descriptions</i> of the impact indicate the governance impact to the community, including the <i>mechanism, categorization as a benefit or a cost, magnitude, geographic extent, timing, frequency, and duration.</i></p>

governance-related costs.

Governance-related benefits refer to any mechanisms associated with a proposed project that strengthen a community's rights and title. Potential sources of these governance-related benefits include the proponent's project application, a CBA negotiated with the project developer, an economic and community development agreement or memorandum of understanding negotiated with a senior level of government, and the IA certificate (and its conditions).

Governance-related costs refer to any mechanisms associated with a proposed project that weaken a community's rights and title. Potential sources of these governance-related costs include sales or leases of land or water title, rights, or tenures to a project developer.

Additionally, *free, prior, and informed consent (FPIC)* is addressed in this account. While not necessarily categorized as a

The mechanism refers to the instrument or tool that is responsible for delivering the governance-related benefits or costs. These mechanisms are likely to derive from legislation, regulation, contracts, or agreements. Potential mechanisms may include (but are not necessarily limited to):

Dispute resolution mechanisms;

Shared decision-making arrangements;

Monitoring and enforcement provisions;

Renegotiation provisions;

Adaptive management provisions; and

Land or water rights, title, tenure sale or leases.

2) *Whether FPIC has been provided by a community/obtained by a developer.*

	<p>project impact, community consent (or lack thereof) has the potential to significantly influence the public interest determination and therefore is an important consideration.</p>			
<p>Summary</p>	<p>This final account measures the net impact of the project on the Indigenous community: the sum of all accounts above</p>	<p>Indigenous government revenue Economic activity Environmental Social Health Governance</p>	<p>-</p>	<p>Generally, a positive net impact, or NPV, indicates that the project is in the community's interest and a negative impact, or NPV, indicates that the project is not in the community's interest. In addition to calculating the net impact of the project in monetary terms, it is important that the summary account also includes other key pieces of information, such as quantitative/physical units and qualitative impact characterizations, to allow for a proper assessment of the trade-offs associated with a proposed project.</p> <p>Ultimately, it is the responsibility of the community decision maker(s) to determine whether the project is in the community's interest and the Indigenous Community MAE Framework and its outputs are intended to help inform the determination.</p>

Appendix B.

Chapter 3 Case Study Results: Public Interest MAE Framework for the Mary River Mine

Table B.1 Public Interest MAE Framework for the Mary River Mine

Account	Sub-account	Summary of impacts	Net Impact ²⁵ (Reference price, Millions of CAD, black text indicates benefit and red text indicates cost)	Sensitivity (Low and high price/GHG cost scenarios, Millions of CAD)
Project Developer	Net Revenue	Mine revenue is generated by selling the iron ore produced by the mine, less project capital costs, operating costs, taxes, royalties, and IIBA payments.	\$1,246 Less unestimated fuel tax and payroll tax expenditures. 52% of total net benefit/resource rent	\$252 - \$1,844
	Federal Government Revenue	The federal government is expected to generate net revenues from the mine based on the following taxes (other tax revenues are assumed to result in no net change in revenue because they would have been generated by alternative economic activity if the mine did not proceed): CIT- Project Developer CIT- Inuit Businesses Net change in personal income tax (PIT)- Inuit Employees	\$431 17% of total net benefit/resource rent	\$208 - \$574
Government Revenue	Government of Nunavut	The government of Nunavut is expected to generate net revenues based on the following taxes (other tax revenues such as personal income taxes are assumed to result in no net change in revenue because they would have been generated by alternative economic activity if the mine did not proceed and/or are offset by net	\$342 13% of total net benefit/resource rent	\$163 - \$456

²⁵ Monetary values are presented as net present values in 2020 Canadian dollars.

	costs to the Nunavut government resulting from the mine): CIT- Project Developer CIT- Inuit Businesses			
	Inuit Governments/ Organizations Revenue	The Inuit; consisting of Nunavut Tunngavik Incorporated (NTI), Kitikmeot Inuit, Kivalliq Inuit, and the QIA; are expected to generate net revenues based on the following sources: Mineral royalty Land lease IBAs (royalty and lump sum payments)	\$445 18% of total net benefit/resource rent	\$273 - \$562
Economic Activity	Training and Education	Training and education fund (\$1 million in each of the first two years following IIBA signing and \$250,000 per year during production phase of mine). Training and education center built in Pond Inlet following approval of Phase 2.	Net benefit to Inuit training and education (see economic activity sub-account in Indigenous Community Account). No net impacts to training and education for rest of Canada.	-
	Employment	Net employment impacts are estimated in PY and the dollar net benefit of employment. For Canada, the employment gains in both person years and dollar benefit are minimal because it is assumed that the social opportunity cost of labour for fly-in/fly-out in-migrant workers is approximately equal to the average wage of mine employees and most of the employees would be employed elsewhere in the Canadian economy if the mine did not proceed. However, some proportion of the Inuit employees may not otherwise be employed in the Canadian economy. For the case study it is assumed that 25% of the Inuit employment for the ERP and Phase 2 construction phases and first 5 years of ERP and Phase 2 operations phases are net in terms of PY and dollars of employment benefit. For the regional economy it is assumed that all of the jobs from the mine are net in terms of PY and there are net	Net contribution to national employment: ERP Construction phase- 19 PY ERP Operations phase- 8 avg annual PY Phase 2 Construction phase- 25 PY Phase 2 Operations phase- 10 avg annual PY Net benefit to national employment: \$23 (Inuit employment benefit)	-

		<p>employment benefits in dollar terms resulting from employment of Inuit workers who otherwise would be unemployed (25% of the Inuit employment for the ERP and Phase 2 construction phases and first 5 years of ERP and Phase 2 operations phases to the region). Inuit workers are expected to make up 17% of the total workforce over the lifetime of the mine. There is also a net benefit to Inuit workers that were previously employed as they are expected to earn higher average wages than they would have in alternative employment, resulting in an estimated annual salary increase of \$49,000.</p> <p>Inuit employment benefits are accompanied by personal income tax payments due to the higher wages earned by mine employees compared to median Nunavut wages.</p> <p>Potential adverse impacts to employment in food harvesting and tourism industries due to impacts to terrestrial and aquatic species.</p>	<p>Net contribution to Nunavut employment:</p> <p>ERP Construction phase- 425 PY ERP Operations phase- 178 avg annual PY Phase 2 Construction phase- 575 PY Phase 2 Operations phase- 232 avg annual PY</p> <p>Net benefit to Nunavut employment:</p> <p>\$23 (Inuit employment benefit)</p>	
Other Economic Impacts		<p>There are expected to be net contracting revenue benefits for Inuit-owned businesses.</p> <p>The contracting benefits are accompanied by corporate income tax payments.</p> <p>Potential adverse impacts to food harvesting and tourism businesses due to impacts to terrestrial and aquatic species.</p> <p>Funding for five Daycare centers following approval of Phase 2.</p> <p>Funding for training and education center built in Pond Inlet following approval of Phase 2.</p> <p>Local infrastructure benefits are accompanied by infrastructure maintenance and operations expenses.</p> <p>Potential adverse impact on Nunavut's tourism industry due to potential impacts to terrestrial, arboreal, and/or aquatic species.</p>	<p>Net impact to Nunavut's economic activity:</p> <p>\$145 (Benefit to Inuit-owned businesses) Less net cost of impacts to food harvesting industry and tourism industry.</p> <p>(Non-market valuation methods could be used to estimate the monetary value of adverse impacts)</p> <p>Net impact to Canada's economic activity:</p> <p>\$0</p>	\$145

		<p>There are not expected to be net economic activity impacts for Canada as it is assumed that the economic activity impacts are just distributional impacts; most of the labour and capital employed in the mine would have been employed in Canada in other activities if the mine did not proceed. Therefore, economic activity benefits generated by the mine are approximately offset by the opportunity cost of the mine and/or net costs to other sectors.</p>	<p>Net contribution to national GDP²⁶: minimal to nil</p> <p>Net contribution to Nunavut GDP: \$7,728</p>	
Environmental	Terrestrial/Arboreal Species	<p>Establishment of a wildlife compensation fund intended to contribute to impact mitigation efforts.</p> <p>Potential adverse impacts to caribou,²⁷ wolf, fox, Arctic hare, ermine, and small mammal populations. Potential impacts include loss of habitat, disruption to movement corridors, mortality, and exposure to contaminants. Impacts expected to be short-term and not significant.</p> <p>Potential adverse impacts to peregrine falcon, snow goose, common and king eider, red-throated loon, thick-billed murre, and Lapland longspur populations. Impacts expected to be limited to displacement from mine footprint. Impacts expected to be long-term but minimal and not significant.</p>	<p>Net benefit to impact mitigation for wildlife/terrestrial species (monetary value included in Inuit governments/organizations revenue sub-account).</p> <p>Net cost associated with impacts to terrestrial and arboreal species.</p> <p>Net monetary impact not estimated.</p> <p>(Non-market valuation could be used to estimate net monetary impact and/or quantitative/qualitative indicators could be used to assess impacts)</p>	-
	Land/Topography	<p>Potential adverse impacts to sensitive landforms including ice rich permafrost, saline permafrost, and thaw sensitive</p>	<p>Net cost associated with permafrost disturbance and associated GHG</p>	-

²⁶ Estimates of gross contribution of Project to GDP have been adjusted to reflect a production of 12 MTA.

²⁷ Caribou were selected as the indicator species (for terrestrial species) in the impact assessment due to their significance in Inuit Culture.

	ground due to construction/infrastructure footprint.	emissions (monetary estimate included in GHG cost estimate).	
Vegetation	Potential adverse impacts to vegetation due to dust deposition from construction activities and trucks travelling on Milne Inlet tote road.	Net cost associated with impacts to vegetation. Net monetary impact not estimated. (Non-market valuation methods could be used to estimate net monetary impact and/or quantitative/qualitative indicators could be used to assess impacts)	-
Archaeological and Heritage Sites	Potential adverse impacts to archeological sites located around Milne Port and along sections of Milne Inlet tote road and proposed rail line.	Net cost associated with impacts to archaeological and heritage sites. Net monetary impact not estimated. (Non-market valuation methods could be used to estimate net monetary impact and/or quantitative/qualitative indicators could be used to assess impacts)	-
Aquatic Species	Potential adverse impacts to marine mammals including polar bears, narwhals, ringed seals, bowhead whales, beluga whales, and walrus due to shipping related noise and disturbance, vessel strikes, blasting and dredging, and ballast water discharge. Potential impacts include loss and disturbance of habitat and mortality.	Net cost associated with impacts to aquatic species. Net monetary impact not estimated. (Non-market valuation methods could be used to	-

	Potential adverse impacts to fish including Arctic char, sculpin, and Greenland cod due to construction/infrastructure footprint, shipping related noise and disturbance, ballast water discharge, and vessel prop wash. Potential impacts include loss and disturbance of habitat and mortality.	estimate net monetary impact and/or quantitative/qualitative indicators could be used to assess impacts)	
Surface Water and Groundwater	<p>Potential adverse impacts to hydrology/water quantity due to water withdrawal at construction camp and construction of culverts.</p> <p>Potential adverse impacts to water quality due to effluent discharge into Mary River (from sewage treatment plants, ore stockpile areas, and mine pit), post-closure pit lake water contamination, and acid rock drainage and metal leaching from newly exposed rock.</p>	<p>Net cost associated with impacts to surface water and groundwater.</p> <p>Net monetary impact not estimated.</p> <p>(Non-market valuation methods could be used to estimate net monetary impact and/or quantitative/qualitative indicators could be used to assess impacts)</p>	-
Air Quality	<p>Potential adverse impacts to air quality due to dust deposition and increase in concentrations of criteria air contaminants including total suspended particulates, SO₂, NO_x, metals, CO, PM₁₀ and PM_{2.5}. Dust deposition impacts expected to be negative, exceed threshold levels, extend beyond the mine site, and be irreversible. Criteria air contaminants are expected to be negative, exceed magnitude thresholds, be limited to the mine site, persist beyond the duration of the mine, be continuous, and be reversible (except for total suspended particulates which are irreversible). Criteria air contaminant emissions over the mines's lifetime are estimated to be the following:</p> <p>SO₂- 1,106 tonnes NO_x- 50,680 tonnes CO- 1,033 tonnes PM₁₀- 1,053 tonnes PM_{2.5}- 186 tonnes</p>	<p>(\$25)</p>	<p>(\$25)</p>

	Greenhouse Gas (GHG) Emissions	<p>Adverse impacts due to GHG emissions from mine equipment (Scope 1 emissions). Mine equipment emissions over the mine's lifetime will total approximately 5.1 Mt of carbon dioxide equivalent (CO₂e).</p> <p>Adverse impacts due to upstream and downstream GHG emissions (Scope 3 emissions). Upstream and downstream emissions over the mine's lifetime will total approximately 8.6 Mt CO₂e.</p>	(\$767)	(\$3,261) - (\$767) ²⁸
	Climate Commitments	<p>The mine would represent 2.98% of Canada's total GHG emissions from mining and 0.10% of Canada's total emissions.</p> <p>Potential adverse impacts on Canada's ability to reach its climate commitments including the Paris Agreement, Canada's 2030 GHG emissions targets, and its Net zero emissions goal.</p>	Net cost associated with adverse impact on climate commitments.	-

²⁸ The high cost GHG estimate is based on Environment and Climate Change Canada's "95th percentile" social cost of carbon estimate which reflects a low probability, high-cost scenario for climate change impacts.

Social	Social Wellbeing	<p>Potential adverse impacts to social wellbeing due to the nature of the work associated with the mine. Fly-in/fly-out requirements of mine employees and boom and bust dynamics of extractive natural resource industries are likely to adversely impact family and community cohesion. Additionally, Inuit employees may leave their communities to seek alternative employment following employment with the mine, further impacting family and community cohesion.</p>	<p>Net cost associated with impacts to social wellbeing.</p>	
		<p>Potential adverse impacts to social wellbeing due to increased levels of substance abuse, family violence, and gambling.</p>	<p>Net monetary impact not estimated</p>	-
		<p>Potential adverse impacts to social wellbeing due to influx of in-migrant workers, which may adversely impact community infrastructure including housing and social services. Additionally, an in-flux of non-Inuit workers may lead to cross-cultural conflicts and impact community cohesion.</p> <p>Potential adverse impacts to social wellbeing due to inequitable hiring practices. Mine employment heavily favours non-Inuit employees (Inuit only make up 17% of total mine employment) and male workers (female workers only make up 9.3% of total mine employment).</p>	<p>(Non-market valuation methods be used to estimate net monetary impact and/or quantitative/qualitative indicators could be used to assess impacts)</p>	
Health	Mental wellbeing	<p>Potential adverse impacts to mental wellbeing in the form of increased levels of substance abuse, family violence, and gambling.</p>	<p>Net cost associated with impacts to mental wellbeing.</p>	
		<p>Potential adverse impacts to mental wellbeing due to cross-cultural conflicts between Inuit and non-Inuit mine employees.</p>	<p>Net monetary impact not estimated.</p> <p>(Non-market valuation methods could be used to estimate net monetary impact and/or quantitative/qualitative indicators could be used to assess impacts)</p>	-

	Physical wellbeing	<p>Potential adverse impacts to Inuit harvesting practices/food availability due to impacts to caribou, ringed seal, arctic char, walrus, and narwhal.</p> <p>Potential adverse impacts to physical wellbeing in the form of increased levels of substance abuse and family violence.</p>	<p>Net cost associated with impacts to physical wellbeing.</p> <p>Net monetary impact not estimated.</p> <p>(Non-market valuation methods could be used to estimate net monetary impact and/or quantitative/qualitative indicators could be used to assess impacts)</p>	-
Indigenous Communities - Inuit ²⁹	Inuit Government/organization revenue	<p>The Inuit; consisting of Nunavut Tunngavik Incorporated (NTI), Kitikmeot Inuit, Kivalliq Inuit, and Qikiqtani Inuit Association (QIA); are expected to generate revenues from the following sources:</p> <p>Mineral royalty Land lease IBAs (royalty and lump sum payments)</p>	<p>\$445</p> <p>18% of total resource rent</p>	\$273 - \$562
	Economic Activity	<p>The mine is expected to have a net benefit for Inuit economic activity including training and education, employment, local business, and local infrastructure.</p> <p>Net employment benefit- \$23 Net contracting benefit- \$122</p>	<p>\$145</p> <p>Less net cost of impacts to food harvesting industry and tourism industry.</p>	\$145
	Environmental	<p>Net cost to air quality.</p> <p>Potential adverse impacts to terrestrial species, birds, land/topography, vegetation, archeological sites, aquatic species, surface water and groundwater.</p>	<p>(\$25)</p> <p>Net cost associated with impacts to terrestrial species, birds, permafrost disturbance, vegetation, archaeological and heritage sites, aquatic species, surface water and groundwater.</p>	(\$25)

²⁹ In practice, this account should be populated by the Indigenous communities that will be affected by the project. For this study's analysis, the Indigenous Communities account has been populated using information from IA documents for illustrative purposes.

	Social	Potential adverse impacts on the social wellbeing of the Inuit.	Net monetary impact not estimated.	-
	Health	Potential adverse impacts on the mental wellbeing, physical wellbeing, and cultural and spiritual wellbeing of the Inuit.	Net monetary impact not estimated.	-
	Governance	Potential adverse impacts on Inuit rights and title.	Net monetary impact not estimated.	-
Summary	Project Developer	Net revenue impacts to the private project developer.	\$1,246	\$252 - \$1,844
	Government Revenue	Net revenue impacts of the mine for the federal government, Government of Nunavut, and Inuit governments.	\$1,217	\$645 - \$1,592
	Economic Activity	Net impacts of the mine on training and education, employment, and economic activity including upstream, downstream, and competing sectors.	\$145	-
	Environmental	Net impacts of mine on land/topography, vegetation, archeological sites, aquatic species, surface water and groundwater, air quality, GHG emissions, and climate commitments.	(\$792) Less net cost associated with impacts to terrestrial species, birds, permafrost disturbance, vegetation, archeological and heritage sites, aquatic species, surface water and groundwater, and climate commitments.	(\$3,286) - (\$792)
	Social	Net impacts of the mine on the social wellbeing of the population of Canada.	Net cost associated with adverse impacts to social wellbeing. Net monetary impact not estimated.	-

	Health	Net impacts of the mine on the mental and physical wellbeing of the population of Canada.	Net cost associated with adverse impacts to mental and physical wellbeing. Net monetary impact not estimated.	-
	Inuit	Net impacts of the mine on the Inuit population of Nunavut.	\$564 ³⁰ Less net economic activity (food harvesting and tourism businesses), environmental, social, health, and governance costs.	\$393 - \$682
Total	Overall Impact of Project	Net impacts of the mine <i>including</i> impacts to the private project developer.	\$1,817 (Excluding non-monetized project costs and benefits).	(Low GHG cost): \$250 - \$2,789 (High GHG cost): (\$2,245) - \$295
	Canadian Public	Net impacts of the mine to Canada <i>excluding</i> impacts to the private project developer.	\$570 (Excluding non-monetized project costs and benefits)	(Low GHG cost): (\$2) - \$945 (High GHG cost): (\$2,497) - (\$1,549)

³⁰ Monetary benefit estimates for Inuit accounted for in government revenue and economic activity accounts.

Appendix C.

Survey on Impact Assessment and Public Interest Multiple Account Evaluation Framework

Consent form

Q1. Taking part in this study is entirely up to you. You have the right to refuse to participate in this study. By clicking 'I AGREE' below you indicate that you consent to participate in this study. You do not waive any of your legal rights by participating in this study.

Answer Choices	Responses
I agree, please take me to the survey	100%

Respondent's organizational affiliation

Q2. Which organization or group are you affiliated with?

Answer Choices	Responses
Impact Assessment Agency of Canada	29%
Natural Resources Canada	22%
Environment and Climate Change Canada	12%
Indigenous Group	2%
University/College	15%
Private Sector	15%
Prefer not to say	2%
Other (please specify)	2%

Evaluation of existing estimation methods used in impact assessment

Q3. Impact estimation methods currently used to inform public interest determinations...

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
<hr/>					

provide a comprehensive assessment of project impacts.	0%	35%	18%	44%	3%
clearly communicate the trade-offs associated with a proposed project.	0%	15%	24%	47%	15%
are prone to overestimating the benefits of a proposed project.	29%	29%	29%	12%	0%
adequately consider impacts to Indigenous groups.	3%	15%	32%	38%	12%
are transparent in how they inform public interest determinations.	0%	9%	24%	50%	18%

Public interest and impact assessment

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
Q4. In your view, whether or not a project is in the public interest should be the primary factor of whether or not to approve a proposed project.	18%	42%	18%	21%	0%
Q5. The term public interest is clearly defined in the context of the IA process.	6%	18%	30%	39%	6%
Q6. The current IA process ensures that proposed projects are only approved if they are in the public interest.	0%	12%	52%	33%	3%
Q7. Based on the results of an IA under the current methods, whether or not a proposed project is in the public interest is always clear	0%	9%	18%	55%	18%
Q8. Determining whether or not a proposed project is in the public interest can involve subjective bias on the part of decision makers	24%	55%	9%	12%	0%

Evaluation of the proposed Public Interest MAE Framework

Theme 1: Suitability to context

Q9. The proposed Public Interest MAE Framework...

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
is an appropriate method for impact assessment (IA).	27%	47%	23%	3%	0%
addresses the factors outlined in the Impact Assessment Act that the Minister or Governor in Council must consider when making a public interest determination (factors summarized below).	10%	70%	13%	7%	0%
can feasibly be implemented by the Impact Assessment Agency of Canada.	13%	40%	33%	13%	0%

Theme 2: Flexibility

Q10. The proposed Public Interest MAE Framework...

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
is adaptable to different types of projects reviewable under the IA process.	13%	77%	10%	0%	0%

Theme 3: Comprehension

Q11. The proposed Public Interest MAE Framework...

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
is a relatively easy-to-understand method.	7%	53%	30%	10%	0%
is no more difficult to understand than other methods used in IA.	13%	43%	13%	17%	0%
is relatively easy to explain to someone that is not familiar with it.	0%	50%	27%	23%	0%

Theme 4: Subjectivity

Q12. The proposed Public Interest MAE Framework...

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
is transparent in showing how impacts are assessed.	3%	70%	17%	10%	0%
helps reduce subjective bias in IA.	13%	30%	40%	17%	0%

Theme 5: Robustness

Q13. The proposed Public Interest MAE Framework...

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
is a comprehensive method that covers the breadth of project impacts.	13%	50%	20%	17%	0%
ensures consideration of project externalities (indirect costs or benefits to a third party caused by a project).	10%	73%	10%	7%	0%
follows logical steps.	10%	57%	20%	0%	0%

Theme 6: Usefulness of outputs

Q14. The proposed Public Interest MAE Framework...

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
facilitates comprehensive understanding of the potential impacts of a proposed project.	17%	60%	17%	7%	0%
presents results in understandable terms.	13%	63%	17%	3%	0%

provides a range of possible impact estimates through the use of a sensitivity analysis.	13%	60%	23%	0%	0%
produces information that is useful for informing a public interest determination.	17%	67%	13%	0%	0%
allows for a clear understanding of the trade-offs between the benefits and costs of a proposed project.	14%	48%	28%	10%	0%

Theme 7: Validity

Q15. The proposed Public Interest MAE Framework...

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
is a methodologically valid tool for impact assessment.	18%	68%	7%	7%	0%
is likely to be viewed as a methodologically valid tool by decision makers.	21%	38%	38%	3%	0%
relies on scientifically valid information.	14%	59%	21%	7%	0%
relies on valid estimation methods.	7%	62%	24%	7%	0%

Theme 8: Participative qualities

Q16. The proposed Public Interest MAE Framework...

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
helps facilitate participation from parties that are likely to be impacted by a proposed project.	7%	41%	41%	10%	0%

Theme 9: Equity

Q17. The proposed Public Interest MAE Framework...

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
helps ensure that the interests of various parties are incorporated into the public interest determination.	14%	45%	28%	14%	0%

Theme 10: Indigenous groups

Q18. The proposed Public Interest MAE Framework...

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
provides a comprehensive assessment of project impacts on Indigenous communities.	10%	38%	28%	24%	0%
can realistically be implemented by Indigenous groups participating in IA.	3%	31%	48%	14%	3%
helps Indigenous communities identify potential changes to proposed project designs (including mitigation measures) to meet their interests.	3%	31%	48%	17%	0%
helps decision makers decide whether a project is in the interests of Indigenous communities.	10%	31%	31%	28%	0%
helps decision makers identify potential changes to proposed project designs (including mitigation measures) to better meet the interests of Indigenous communities.	3%	38%	31%	28%	0%

The proposed Public Interest MAE Framework versus current estimation methods in impact assessment

Q19. The proposed Public Interest MAE Framework...

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
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produces more comprehensive information than the current methods used in IA.	14%	59%	24%	3%	0%
is less prone to overestimating benefits than current methods used in IA.	24%	34%	28%	14%	0%
is less prone to underestimating costs than current methods used in IA.	17%	34%	41%	7%	0%
communicates the trade-offs of a proposed project more clearly than the current methods used in IA.	17%	76%	3%	3%	0%
considers impacts to Indigenous groups better than the current methods used in IA.	14%	31%	34%	21%	0%
is more transparent in how it informs public interest determinations than the current methods used in IA.	24%	41%	21%	14%	0%

Final thoughts

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
Q20. An MAE framework has the potential to improve public interest determinations in IA.	24%	59%	7%	10%	0%
Q21. It would be helpful to further develop and test the Public Interest MAE Framework as a means of informing public interest determinations in impact assessment.	36%	57%	4%	4%	0%

Q22. What are the key strengths of the MAE framework for impact assessment?

Table C.1 Strengths of the proposed Public Interest MAE Framework identified by survey respondents

Strengths	Number of responses	Percentage of responses
Comprehensive	7	19%
Clearly displays and summarizes information	5	14%
Focuses on net impacts	4	11%
Considers non-market impacts	3	8%
Transparency	2	6%
Focuses on Indigenous communities	2	6%
Focuses on distribution of impacts	2	6%

Decreases subjectivity	1	3%
Predictable	1	3%
Consistent	1	3%
Improves information and understanding	1	3%
Integrates benefits of multiple methods	1	3%
Incorporates sensitivity analyses	1	3%
Addresses sustainability and climate change	1	3%
Provides greater justification for decision makers	1	3%
Rigorous	1	3%
Useful for assessing marginal projects	1	3%
Helps identify potential significant adverse impacts	1	3%
Total responses	36	100%

Q23. What are the key weaknesses of the MAE framework for impact assessment?

Table C.2 Weaknesses of the proposed Public Interest MAE Framework identified by survey respondents

Weaknesses of the MAE framework	Number of responses	Percentage of responses
Difficult to estimate non-market impacts in monetary terms	5	16%
Challenging to compare between quantitative and qualitative impacts	4	13%
Unclear how mitigation efforts are considered	2	6%
Limits discretion of decision makers	2	6%
Does not weight the most significant impacts	2	6%
Does not provide enough focus on impacts to Indigenous communities	2	6%
Onerous, difficult to implement	2	6%
Assumptions drive results	2	6%
Does not eliminate subjectivity	2	6%
Does not consider cumulative impacts	1	3%
Not all impacts are quantified in case study	1	3%
May encourage proponents to aim for minimum acceptable net benefit	1	3%
Does not achieve what it sets out to achieve	1	3%
Biasedly weights quantitative data over qualitative data	1	3%
Relationship between PI and IC frameworks unclear	1	3%
Focuses on limited set of indicators	1	3%
Does not state limitations of non-market valuation	1	3%
Total responses	31	100%

Q.24 What are the main challenges in implementing the MAE framework into the impact assessment process?

Table C.3 Potential challenges in implementing proposed Public Interest MAE Framework identified by survey respondents

Potential challenges in implementing the MAE framework	Number of responses	Percentage of responses
Quantifying impacts requires additional resources and skills	5	19%
Reaching consensus around methods and values for impacts	3	12%
Does not align with how IA works in reality	3	12%
Relies on confidential financial information	2	8%
Overly complicated, complex	2	8%
Does not consider the intangibles	1	4%
Comparing between qualitative and quantitative impacts	1	4%
Does not consider long-term impact estimates	1	4%
How to deal with estimating the value of extinction- species, language, etc.	1	4%
Path dependency associated with current IA process	1	4%
Capacity limitations of small communities and Indigenous groups	1	4%
Limited availability of disaggregated data	1	4%
Maintaining consistency over time	1	4%
Analytical limitations of methods	1	4%
Dependent on quality, accuracy of inputs	1	4%
Will not be applicable across all projects	1	4%
Total responses	26	100%

Q25. Do you have any suggestions on how the MAE framework can be revised to make it more suitable to impact assessment?

Table C.4 Suggested revisions to the Public Interest MAE Framework

Suggested revisions	Number of responses	Percentage of responses
Estimate, quantify more impacts for case study	1	7%
Be clear about limitations of MAE framework	1	7%
Discuss connection, gap between MAE results and final decision	1	7%
Accounts for Indigenous framework must be defined by the communities themselves	1	7%
Reframe so that it is not focused on public interest	1	7%
Be clear that objective is to decrease, not eliminate subjectivity	1	7%
Include tool for estimating non-market impacts	1	7%
Address factors that are currently outside the Framework	1	7%
CBA guidance should be adapted to IA	1	7%
Focus on net impacts for non-market impacts	1	7%

Develop recommendations around whether or not to include project developer account	1	7%
Add guidance on the kinds of questions decision makers should consider in making trade-off judgements	1	7%
Be clear about the role of value judgements in the MAE framework, IA	1	7%
MAE framework should report how different parties feel about the trade-offs	1	7%
Total responses	14	100%

Q26. Is there anything else you would like to add?

Table C.5 Additional thoughts raised by survey respondents

Additional thoughts	Number of responses	Percentage of responses
Hard to tell how much MAE will benefit IA	2	20%
Framework is a huge improvement over current approach to IA	1	10%
Framework may interfere with decision making	1	10%
Create a French version of report	1	10%
A good exercise since it will force valuation of the unvalued resources	1	10%
Hopefully this is first step in treasury board approved framework	1	10%
Guidance on framework implementation needs to be further developed	1	10%
Who will be responsible for conducting MAE analysis	1	10%
There should have been an I don't know option for survey	1	10%
Total responses	10	100%

Appendix D.

Chapter 4 Case Study Assumptions, Model Inputs, and Results

Table D.1 Project Parameter Assumptions

Project Parameters	(\$ in 2023 CAD)
Construction phase	2 years (2013-2015)
Operations phase	21 years (2015-2035)
Closure phase	3 years (2035-2038)
Capex	\$961 million
Opex (\$/tonne)	\$62 million
Production	4.2 MTA (2013-2017) 6 MTA (2018-2035)
Iron ore price (\$/tonne)	\$130 (Ref) ³¹ \$116 (Low) ³² \$142 (High) ³³
Discount rate (real)	8%
Total project employees (FTE)	561 (2013-2017) 1098 (2018-2035)

Table D.2 IIBA provisions and model inputs

IIBA Provisions	(\$ in 2023 CAD)
Royalty rate (% of net sales revenue)	1.19%
Advance payments	
• Signing bonus	\$6.3 million
• Milestone- water license	\$6.3 million
• Milestone- construction decision	\$12.7 million
• Milestone- construction	\$1.6 million
Infrastructure- Pond Inlet training centre	\$11.7 million
Inuit employment cost relative to FIFO employment cost (per employee)	-\$19,970 (2013-2017) -\$17,255 (2018-2035)

³¹ Reference price is based on the average market price from 2005 to 2022

³² Low price is based on the average price from 2015-2022

³³ High price is based on a forecast made by Baffinland (Baffinland Iron Mines Corporation, 2011; Loxley, 2019).

Inuit procurement	
Business capacity fund (per year)	\$320,000
Ilagiktunut Community Wellness Fund	\$243,271 (2013-2017)
	\$455,274 (2018-2035)
IIBA implementation	\$243,271 (2013-2017)
	\$455,274 (2018-2035)

Table D.3 Cost of Mary River IIBA relative to economic viability of project and relative to cost of conflict (with sensitivity analysis)

Scenario (decision tree variable)		Ref Price (Millions of 2023 CAD)	Low Price (Millions of 2023 CAD)	High Price (Millions of 2023 CAD)
Counterfactual ($X - Y_2$) (Notional IIBA, no conflict)	Project NPV	\$1,294	\$849	\$1,662
	Project IRR	22.7%	18.3%	25.9%
1. Incremental cost of consent-seeking IIBA (Y_1)	Cost (present value)	\$95	\$90	\$99
	IRR impact (Percentage points)	-1.4%	-1.4%	-1.5%
2a. Cost of delay prior to construction (C per year)	Cost (present value)	\$102	\$69	\$130
	IRR impact (Percentage points)	-0.5%	-0.3%	-0.6%
2b. Cost of delay mid-construction (C per year)	Cost (present value)	\$135	\$102	\$162
	IRR impact (Percentage points)	-2.4%	-1.8%	-3.0%