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or

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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

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

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).

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,

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.

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.

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.

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 directl(ad)3(ap)3(t)-4( )6(M)-3(A)1y0 1 210.53 5300000912 09ectl(ad)3(ap)3(t)-4(

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.

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 mity8Ag hh5(b)13(ute)] TJETQq0.0

benefits

(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

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

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.

Frame (General)	Theme (Specific)	
Instruments that...	*Instruments that...*	Number and (%) of Articles
Reinforce and legitimize the status quo of natural resource governance. (72%)	Perpetuate unequal power dynamics between the	

Facilitate economic and social development in remote communities.

Facilitate sustainable community development. (81%)

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

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 disproportionally high share of the costs

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

levels of government

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

equity partners can benefit from securing increased decision-making power and receiving a portion of project revenue

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

regulatory processes, and has some overlap with the securing community approval and mitigating adverse impacts themes

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

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

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

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

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

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).

Currently, economic impacts for proposed projects are

environmental risks, discount rates, etc.) can result in wide variability in estimates

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; Tsleil-Waututh Nation, n.d.) and literature on Indigenous-led IAs (First Nations Energy and Mining Council, 2019; Shandro & Jokinen, 2018) that provide

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

Account	Description	Potential sub-accounts and components	Potential estimation methods	Indicators

[12] For more information regarding Indigenous community sub-

	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.

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.

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

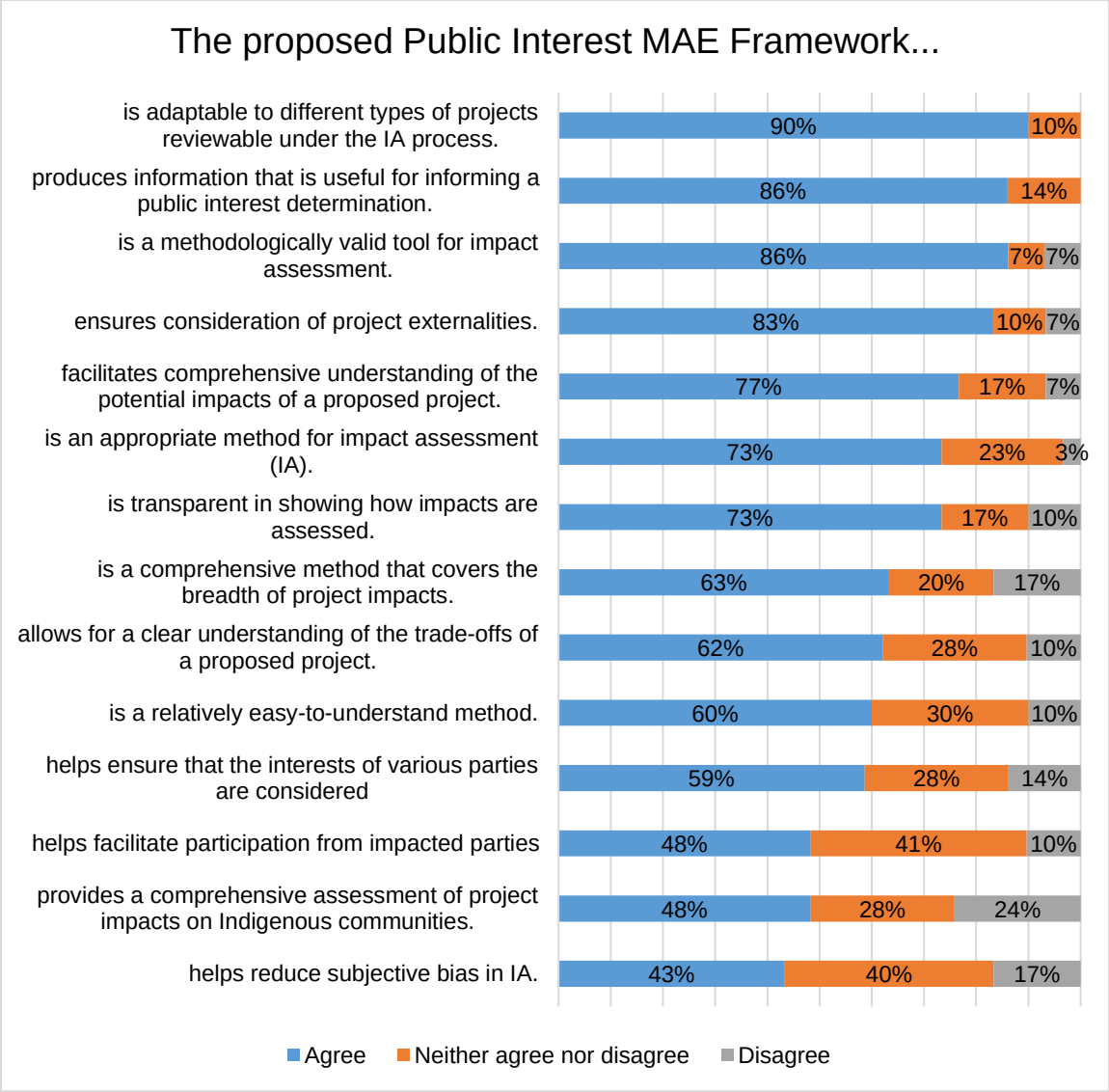
		approximately offset by the opportunity cost of the mine and/or net costs to other sectors. Therefore, economic activity benefits are limited to Inuit employment ($23 million) and Inuit-owned businesses ($122 million).		
	Environmental	Net impacts of the mine on land/topography, vegetation, archeological 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	

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.

Indicator	Conventional Economic Impact Analysis	Multiple Account Evaluation
Gross employment	5,031 PY (construction) 903 to 1,177	

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).



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).

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

CBAs 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

operating expenditures, taxes,

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 r3.82 Tm0 g0 Gc33e048005500B600561300

Through a case study analysis, this study seeks to estimate the cost of a consent-seeking CBA for a project developer ($_1$). 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 ( ), indicating its impact on economic viability; and (iii) a hypothetical cost of conflict ( ), which determines a shareholder-motivated project developer's decision to make a consent-seeking CBA offer or a notional CBA offer.

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.

In our case study analysis, we estimate the incremental cost of a CBA for a project developer over the lifetime o/F2 11.04 Tf1 0 0 BA for a project

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 & Lépiz, 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.

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

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 Ilagiiktunut 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).

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 Ilagiiktunut 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.

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	
Business capacity fund	

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.

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).

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

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.

We estimate the realized outcomes of the IIBA from 2013 to 2022 using information from Baffinland's publicly available socio-

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

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 Ilagiiktunut Community Wellness Fund	$243,271	$455,274

Notional IIBA is provided and there is no conflict.	Consent-seeking IIBA is negotiated and there is no conflict.

	Shareholder theory	Stakeholder theory
Decision rule: Offer consent-seeking CBA if…	$_1 < (1 - \quad) + {}_2$	$_1 <$
Case study results (Millions of 2023 CAD)	$\$95 < (1 - \quad)\$102 \times \quad {}^{21}$ Or $\$95 < (1 - \quad)\$135 \times \quad {}^{21}$	$\$95 < \$1{,}294$

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 ($_1$) is lower than the expected value of the cost of conflict ((1 −)) plus the cost of a notional CBA offer ($_2$) (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,

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

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 fa

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

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.

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

CBAs 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 increas

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

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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				(e.g., magnitude, geographic extent, timing, frequency, and duration of the impacts) *or other level of measurement such as sustainability targets.*
Social	This account measures the impact of the proposed project on the community's social wellbeing. *Social wellbeing* 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. Social impacts may instead be incorporated into the health account depending on how a community defines health and whether it includes social wellbeing.			

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. The *mental* and *physical wellbeing* of community members may be affected by changes in access to food sources, adequate housing, drinking water, recreational opportunities, etc. *Cultural* and *spiritual wellbeing* 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.		Assessment (HHRA) Non-market Valuation Revealed Preference Stated Preference Replacement/ offset cost	impacts are likely to include: M*onetary estimate in current CAD* (*NPV)* e.g., estimated cost of additional health service provision); *Quantitative/physical units*; and/or *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.*

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 impact, community consent (or lack thereof) has the potential to significantly influence the public interest determination and therefore is an important consideration.			
Summary	This final account measures the net impact of the project on the Indigenous community: the sum of all accounts above	Indigenous government revenue Economic activity Environmental Social Health Governance	-	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

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			

	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
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		

Economic Activity

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. Inuit employment benefits are accompanied by personal income tax payments due to the higher wages earned by mine employees compared to median Nunavut wages. Potential adverse impacts to employment in food harvesting and tourism industries due to impacts to terrestrial and aquatic species.	Net contribution to Nunavut employment: 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 Net benefit to Nunavut employment: $23 (Inuit employment	

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;

		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. Potential adverse impacts to hydrology/	estimate net monetary impact and/or quantitative/qualitative indicators could be used to assess impacts)
	Surface Water and Groundwater		

Greenhouse Gas (GHG) Emissions	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 (CO_2e). 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 CO_2e.	($767)	($3,261) - ($767)

Social	Social Wellbeing	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.	Net cost associated with).
		Potential adverse impacts to social wellbeing due to increased levels of substance abuse, family violence, and gambling.	
		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.	
		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).	

Indigenous Communities - Inuit[29]	Physical wellbeing	Potential adverse impacts to Inuit harvesting practices/food availability due to impacts to caribou, ringed seal, artic char, walrus, and narwhal. Potential adverse impacts to physical wellbeing in the form of increased levels of substance abuse and family violence.	Net cost associated with impacts to physical wellbeing. 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)
	Inuit Government/organization revenue	The Inuit; consisting of Nunavut Tunngavik Incorporated (NTI), Kitikmeot Inuit, Kivalliq	

	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.	-

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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%

	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%	

Theme 4: Subjectivity

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%

	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%

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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.					

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%

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%

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)

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