Impact Benefit Agreement Guidebook

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For more information please visit www.sfu.ca/rem/planning/research/IBA.html or contact gunton@sfu.ca

CIRDI Canadian International Resources and Development Institute

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SCHOOL OF RESOURCE & ENVIRONMENTAL MANAGEMENT

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List of Acronyms

DCF	Discounted Cash Flow
IBA	Impact Benefit Agreement
NPV	Net Present Value
PSC	Production-Sharing Contract

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Introduction

1.1 Guidebook Purpose

Agreements between project developers and impacted communities are an increasingly popular means for communities to obtain a share of project benefits and mitigate adverse impacts. These agreements can have a variety of names including community benefit agreement, benefit sharing agreement, and impact benefit agreement. This Guidebook uses the term impact benefit agreement (IBA) to refer to these types of agreements.

There are many excellent guidebooks that provide advice on how to negotiate IBAs.[1] However, there is no guidebook currently available that provides in-depth advice on how to design the fiscal components of an agreement to achieve a fair distribution of project revenue for the community. This Guidebook addresses this gap by:

1. Summarizing key revenue-generating tools (referred to as fiscal instruments) and their respective advantages and disadvantages;
2. Providing a financial model that can be used to estimate the income that can be expected by a community from different fiscal instruments as well as instructions on how to use the model, and;
3. Providing guidelines for choosing the best fiscal instrument or combination of fiscal instruments (referred to as a fiscal regime) for the community.

Resource extraction projects can generate significant profits and this Guidebook is meant to assist communities in designing fiscal instruments that ensure a fair distribution of these profits. This Guidebook is intended for parties that could be affected by a proposed resource project and/or have resource ownership rights and want to evaluate options for collecting revenue from resource development for the community. The affected community may be a number of different entities including, but not limited to, Indigenous communities, local governments, or impacted stakeholders. It should be noted that this Guidebook focuses on fiscal components of IBAs. Those interested in other components of IBAs, such as measures for mitigating adverse environmental impacts and providing employment benefits, should consult other relevant sources.[2]

1.2 Guidebook Structure

In this first part of the Guidebook, we provide background information on resource development and IBAs. Part 2 of the Guidebook summarizes the IBA negotiation process and Part 3 contains a list of common IBA provisions. Part 4 describes common fiscal instruments used in IBAs and criteria to evaluate their respective advantages and disadvantages. Part 5 summarizes business strategies that can undermine the effectiveness of IBAs and provides tips on how to address them. Part 6 uses an economic model to evaluate alternative fiscal regimes and Part 7 uses the results of the evaluation and other information to provide guidance on how to choose an optimal fiscal regime. The appendices include a checklist of best

practice guidelines for IBAs (Appendix A), a mine model outline and user guide (Appendix B) used to evaluate fiscal instruments, the model outputs (Appendix C), and a summary of existing mining IBA fiscal provisions (Appendix D). Our examples and scenarios are drawn from national and international examples of IBA practice. It is our hope that the Guidebook offers insights for effective and equitable sharing of IBA fiscal benefits in a variety of settings.

1.3 Resource Context and IBA Background

Natural resource extraction is a common activity that occurs throughout the world, often in remote regions. Resource extraction is generally undertaken by private companies with the goal of generating a profit for shareholders. Natural resource extraction projects can face risks resulting from long exploration and pre-production periods during which no revenue is generated, volatile international commodity markets and environmental and political uncertainty.[3] What makes natural resource extraction projects attractive is their ability to generate sizeable economic rents, which are surplus project revenues in excess of all costs of production, including a normal return on capital.[4]

Cost and benefits of resource development: The decision to develop a resource is not an easy one. Private project developers and communities must take into account all the costs and benefits associated with resource development before making the decision to proceed. From the community's perspective, some potential costs associated with resource development include, but are not limited to:

- Environmental degradation (such as seepage of harmful chemicals into ecosystems and/or watersheds, animal habitat loss and/or fragmentation, soil erosion and slope instability, etc.)
- Cultural impacts (such as the loss of culturally significant areas, etc.)
- Social impacts (such as ones resulting from an influx of new workers including increased pressure on health services and the local housing market and the potential loss of the local 'identity')
- Economic impacts (Such as the loss of jobs due to environmental degradation, e.g., fishing)

Some potential benefits include:

- Revenue generation
- Job creation
- New and/or improved infrastructure (such as medical buildings, schools, recreation centers, roads, etc.)

Natural resource development projects can have both beneficial and adverse effects on impacted communities.[5] Projects can generate community economic benefits by providing employment and income. But projects can also generate adverse impacts such as displacement of people, impairment of activities, such as hunting and fishing, social stress caused by rapid change (e.g., influx of mobile workers), and adverse environmental impacts on air, water, and other community ecosystems. Community economic benefits can also be limited by using mobile workers and outside suppliers in place of local workers and local businesses. At the macro scale, larger resource projects may experience boom and bust cycles driven by international commodity markets that can create economic instability. Projects based on non-renewable resources such as mining will ultimately close, creating major economic challenges for the community and region. Consequently, resource development proposals must be carefully assessed by communities to identify the costs and benefits and determine whether the proposed project is in the best interests of the community and how the project should be developed and managed to meet community and regional objectives.

In many countries, such as Canada and Australia, natural resources are publicly owned and managed on behalf of the public by a provincial or state government.[6] Indigenous populations may also own or have ownership claims to natural resources in many jurisdictions. Provincial, state, and Indigenous governments have the ability to develop fiscal instruments, such as taxes and royalties, to

collect revenue from private sector developers extracting the natural resource. This revenue is a return to the public or Indigenous owner for their natural resource.[7] Benefits from resource revenue may enhance government budgets to help finance health and educational services, moderate tax rates, and maintain or construct new infrastructure.[8]

While resource revenues are supposed to be collected by governments to provide a fair return to the public owner, revenues may not be effectively used to offset the adverse impacts that may be suffered by the community or region closest to the resource extraction project.[9] In many instances, the profits from resource development may be retained by private corporations and not shared with the public. In recent years, however, affected parties, including Indigenous communities, governments, and various stakeholders, have done more to assert their resource ownership rights (or to highlight negative impacts associated with natural resource projects that require mitigation through benefits), primarily through the court systems, social and environmental review processes, or direct action. As a result, project developers are increasingly aware that they need to receive consent or "social license" from parties that may be affected by a resource project before the project can proceed.

Economic rent: An important component of the economics surrounding natural resource extraction is rent. Rent is the excess revenue over the cost of producing the natural resource, including a normal return to capital. Rent is the value of the in situ natural resource. Fiscal mechanisms, such as royalties and taxes, are designed to collect a portion of the rent and ensure the owners of the resource receive fair market value for its sale. The "owners" of the resource may be private entities and/or governments (including national, provincial/state, local, and/or Indigenous communities). Collecting rent and generating revenue for the owners of a natural resource helps provide justification for depleting the resource and any potential impacts associated with resource extraction.

Fiscal instruments: Monetary benefits are collected from natural resources by various levels of government and communities through fiscal instruments. Fiscal instruments come in many different forms, each with its own set of advantages and disadvantages. Some common fiscal instruments include fixed payments, royalties, and taxes. A description of all the key fiscal instruments and their respective advantages is provided in this Guidebook.

In a resource development context, consent or "social license" is defined as community approval and stakeholder support for a project.[10] The concept of consent has been expanded by international standards, such as the United Nations Declaration on the Rights of Indigenous Peoples.[11] When a community gives consent to develop a project, it must be free from force, intimidation, or pressure of any kind; it must be sought and given prior to licenses and project development plans being approved; and it must be informed, meaning that the community based their decision on adequate information provided by the project developer and independent experts that can be used to develop mitigation strategies to ensure that the impacted community benefits from project development.[12] If these criteria are not met, the affected community will most likely have a strong claim to challenge and halt the project through legal processes.[13]

An increasingly common way of acquiring consent from an affected party is through negotiating an IBA. IBAs are legally binding contracts signed between a project developer, a private project proponent or a government, and a community that may potentially be affected by a project. Theoretically, IBAs are a tool that can be used to develop a win-win scenario in which the project developer secures consent and increases the level of certainty that the project will go ahead, and the affected community secures its fair share of benefits from the resource project. As a result, IBAs have become legally, or de facto, mandated in many countries. As of February 2020, there are more than 400 active IBAs for mining projects in Canada.[14] Though they are growing in popularity, the success of IBAs is not guaranteed and largely depends on the legal rights and negotiating power of the community to determine whether the project can be built and the design and contents of the IBA.[15] An additional challenge to the widespread use of IBAs is that information on the agreements may often be difficult to access because many IBAs remain confidential, thus reducing the collective knowledge and knowledge transfer associated with understanding IBA structures in different contexts.

Free, prior, and informed consent is an international standard for the consultation process applicable to natural resource development projects. The consent must be free from force, given prior to any project decisions being made, and must be well informed by the project developer and experts.

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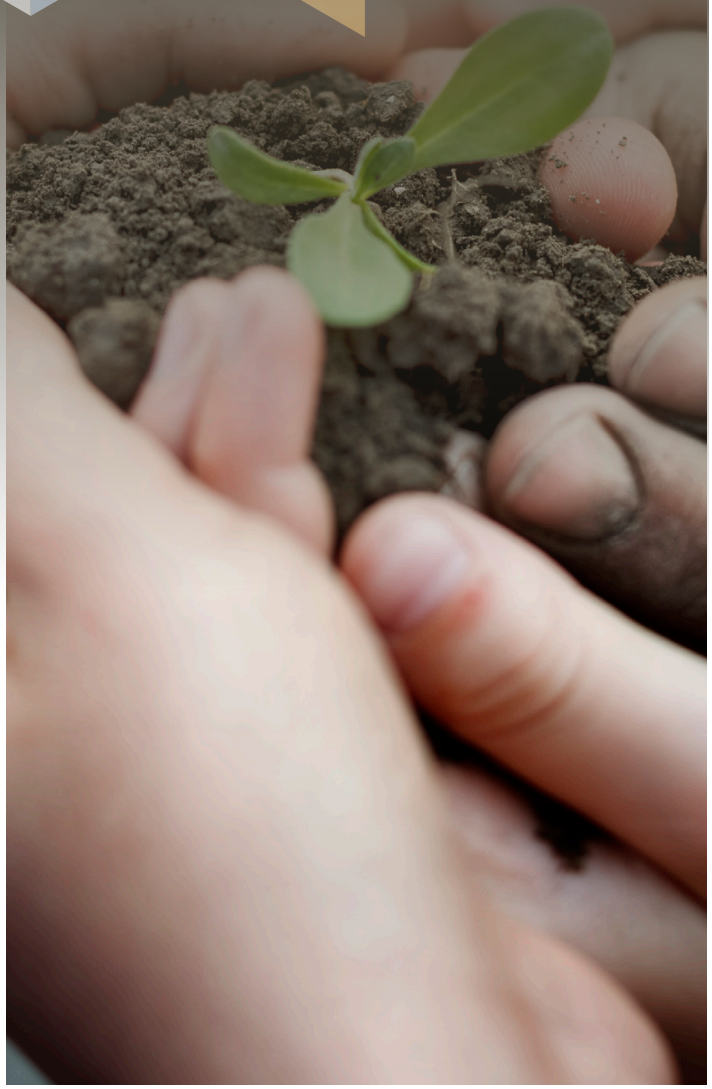
The IBA Process in Review



The IBA process consists of four stages. The first stage is pre-negotiation. In this stage, it is critical that the project developer and the community begin to build a collaborative relationship. This often consists of the project developer engaging with the entire community and sharing information about the proposed project. The community should gather as much information as possible on the proposed project and on the project developer. Once this relationship has started, the community should have internal meetings (that do not include the project developer) to identify community goals and needs, assess capacity constraints, and gauge the level of support that community members have for the project. It is important for the community leaders to fully engage the entire community in these discussions. If the community decides that it is interested in moving forward and negotiating an IBA, it is beneficial to develop a precursor agreement, such as a memorandum of understanding, in which the community and project developer agree upon a negotiation process for developing an IBA. Signing a memorandum of understanding does not constitute a form of consent for the project, but rather sets out the ground rules for how negotiations will proceed with the goal of developing a mutually agreed upon IBA design. Precursor agreements often contain financial payments to the community to help fund the community's assessment of the project and development of preconditions for project development.

The second stage is negotiation of the IBA. Historically, monetary benefits have been a key provision negotiated in IBAs. Monetary IBA provisions can include establishing and securing income for development or investment funds, creating a project equity sharing scheme, and establishing a fiscal regime. Additional non-monetary benefits are more diverse and may include provisions for providing infrastructure, employment, local business opportunities, and education and training for the community. The negotiators representing the community should fully engage the community in developing the objectives and contents of the IBA and the IBA should be formally approved and signed by elected official(s) or leaders that legitimately represent all stakeholder groups. Once the agreement has been signed it functions as a legal contract between the community and the project developer. Consequently, it is important for the community to work with legal counsel to ensure that the IBA is legally enforceable and clearly defines the obligations of the community and project developer.[16]

The third IBA stage is implementation. It is during this stage that the IBA begins to generate benefits for the community. A key component of this stage is monitoring the IBA provisions and determining whether they are performing as intended and generating the benefits that were agreed to during the negotiation stage.[17] If certain IBA provisions are not performing as intended or the IBA is not meeting community objectives, there should be an option for both parties to collaboratively reopen and revise specific parts of the IBA and dispute resolution procedures to resolve outstanding issues if the parties cannot mutually agree.

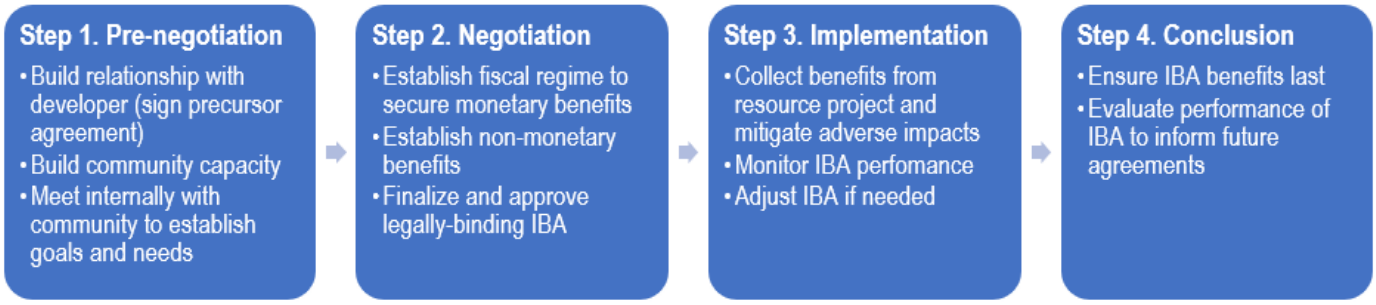


Figure 1. The IBA process

The final stage is the conclusion of the IBA. An IBA often expires once a project has ceased its operations. It is important that the IBA is designed with the goal of generating lasting benefits that continue to support the affected community for generations and to address potential issues such as site reclamation after the project closes. It is also important that the affected community evaluate the IBA design and assemble a list of strengths and weaknesses of the IBA to help inform future IBAs.[18]

3

IBA Provisions

There is broad diversity in the characteristics of IBAs that vary depending on the goals and objectives of the signatories and the nature of the project. Despite this diversity, most communities consider the following issues for inclusion in their IBAs:

- Communication and confidential provisions;
- Indigenous community and public access to mining tenures;
- Fiscal regime to generate revenue for signatories;
- Management of funds collected by fiscal regime;
- Employment (hiring targets, labour supply, recruitment, hiring preferences, etc.);
- Education and training;
- Union relationships;
- Business development including purchasing strategies to support local business;
- Environmental management, including;
  - ° Permits and licenses
  - ° Research on environmental issues
  - ° Monitoring and management systems
  - ° Mitigation measures
- Protection of local culture and heritage;
- Compensation for adverse impacts such as impairment of Indigenous harvesting and traditional use;
- Social measures to mitigate impacts;
- Dispute resolution procedures;
- Provision of community infrastructure; and
- Community participation in project management.

4

Fiscal Instruments

Fiscal instruments are an important component of IBAs because they are one of the principle tools for providing economic benefits to the impacted community. Fiscal instruments are used to help compensate for adverse impacts (social, environmental, cultural, economic, and health) that are not fully mitigated by other provisions in the IBA as well as provide a fair share of the profits generated by a resource project to the owners of the resource (public, Indigenous community, etc.).

A fiscal regime consists of a collection of fiscal instruments that apply to a certain extractive industry or project. The design of the fiscal regime is important because it determines the share of the financial benefits that will accrue to each of the parties involved (project developer, community, government, etc.). As discussed earlier, the purpose of this Guidebook is to help communities negotiate a fiscal regime that results in an optimal and fair distribution of project benefits.

4.1 Fiscal Provisions in Impact Benefit Agreements

Two methods were used to collect the data on IBA fiscal instruments used to develop this Guidebook. The first method was the creation of an IBA Fiscal Instrument and Regime Database that is summarized in Appendix D. The IBA Fiscal Instrument and Regime Database is an inventory of fiscal regimes and tools used in IBAs. The database was created by collecting a total of seventy-eight agreements from numerous countries including Australia, Canada, Ghana, Greenland, Laos, Mongolia, and Papua New Guinea. The agreements contained within this database were mainly sourced from the Columbia Centre for Sustainable Investment's (CCSI) Community Development Agreement Database,[19] and the government of British Columbia's website.[20] A few agreements that are not technically IBAs but contain many overlapping characteristics were also added to the database, such as the Peace River Agreement — a grant in lieu of property taxes that was negotiated between a collection of northeastern BC municipalities and the BC provincial government. The database contains bilateral agreements for the natural resource sectors of mining, forestry, oil and gas, and renewable energy. The database summarizes the provisions of each fiscal regime and the fiscal instruments that make up the fiscal regime.

The second method was the completion of a literature review of key fiscal instruments used in IBAs and other revenue sharing agreements. All of the reviewed documents were found using search engines, with the keywords "fiscal regime", "fiscal system", "natural resource", "benefit agreement", "revenue sharing", "community", "resource taxation", "rent", "extractive industries", and "mining", in various combinations. Additionally, the reference lists of all reviewed documents were consulted to identify related literature. The IBA database and the documents consulted in the literature review are available at: http://www.sfu.ca/rem/planning/research/IBA/Database.html

4.2 Project Developer Objectives

Before negotiations begin, it is important for community representatives to understand the objectives of the project developer. Simply put, natural resource project developers are interested in maximizing the profit for investors over the long term. Before contacting a community regarding a proposed project, the project developer will likely have performed a feasibility analysis, often using a discounted cash flow (DCF) model that forecasts revenues and costs of the proposed project over the project's life. The DCF forecasts all expected project revenues and expenses by year, brings these future values into present day dollars using a specified target rate of profit or "discount rate", and estimates the value of the project, or its net present value (NPV). If the calculated NPV for a project is positive, then it is worth pursuing from the perspective of the developer because the project will cover all costs and provide a profit to investors. If the NPV is negative, then the project developer will not proceed with the investment. There is considerable uncertainty in forecasting project revenues and expenditures due to uncertainty regarding future resource commodity price and production cost assumptions. To account for this uncertainty, the project developer will assess different scenarios with higher and lower commodity prices and extraction costs to determine whether the project is worth developing under different forecast assumptions. The project developer may also use a higher profit target or "hurdle rate of return" to take into account the project risks.

It is important for communities to understand that any requests to project developers — such as requiring the company to implement measures to mitigate adverse environmental impacts, hire and train local workers, and make payments to the community — may increase the costs of the project. If the costs are increased to the point that the investors will not make their target rate of return, the project will not be undertaken. Therefore, it is important for the community to understand the financial objectives of the project developer in order to realistically evaluate what community demands the developer can fulfill while still leaving a sufficient return for the investors to proceed with the project.

4.3 Community Objectives

Fiscal instruments should be evaluated relative to community objectives. The term community is used to describe all of the signatories to an IBA, excluding the project developer. The following table (Table 1) provides an overview of some objectives that are often used as evaluation criteria to guide design of a fiscal regime from the perspective of a community IBA signatory.

Table 1. IBA Evaluation Criteria[21]

Evaluation Criteria	Definition	Indicator
1. Revenue Generation	This criterion refers to the amount of revenue that the fiscal regime is capable of generating over the lifetime of the project as well as the proportion of total project rent that is collected. An optimal fiscal regime should maximize the revenue (economic rent) collected by the community.	a. An estimate of the NPV of the revenue generated for the community by the fiscal regime b. An estimate of the proportion of total rent collected by the community by the fiscal regime.
2. Revenue Stability	This criterion refers to the variability and certainty of revenue to the community over the lifetime of the project. An optimal fiscal regime should ensure a relatively stable flow of income throughout the project's life (from the initial project feasibility assessment to post-project site remediation).	a. An estimate of the annual variability of revenue over the lifetime of the project using the financial model. b. The standard deviation of the revenue generated by each fiscal instrument.
3. Administrative Efficiency	This criterion refers to the capacity of the community (expertise, time, and money) that is required to utilize a fiscal instrument or regime. This criterion includes commercial expertise that may be required to implement an equity-based investment. An optimal fiscal regime is one that requires a low level of capacity for the parties to administer, thus improving compliance.	An assessment of the level of administrative capacity required to implement a fiscal instrument. A low level of required capacity corresponds with a high level of administrative efficiency.
4. Neutrality	This criterion refers to potential impacts that the fiscal regime may have on the project developer's business decisions. A neutral fiscal regime is one that does not discourage or alter investment or production decisions. An optimal fiscal regime should capture only the economic rent and not reduce the potential benefits of the project by discouraging investment and production.	An assessment of the degree to which the fiscal regime affects business decisions regarding investment and production.
5. Decision-making Power	This criterion refers to the amount of project decision-making power that a community has under a given fiscal regime. An optimal regime should provide the community with some control over project management decisions.	An estimate of the amount of influence that a community has on project-related decisions.

No single fiscal instrument excels in all of the criteria and choosing a fiscal instrument will result in trade-offs between community objectives. For example, fiscal regimes that maximize the revenue accruing to the community may be difficult to administer and may reduce total project benefits by reducing project investment and production. Alternatively, fiscal regimes that collect less revenue will reduce the share of benefits accruing to the community and increase the share accruing to the project developer. It is important for the community to understand the evaluative criteria and prioritize objectives in order to choose a fiscal regime that will meet its needs and maximize the benefits it receives.

4.4 Types of Fiscal Instruments[22]

4.4.1 Fixed Payments

Fixed payments are the most common fiscal instrument used in IBAs and consist of the project developer agreeing to make specified payments to the community at various stages of the resource project's lifetime. Fixed payments can be made periodically over the lifetime of a project (for example every year or every quarter), and additional payments may be triggered by the start of production and when specified production milestones are reached. It is also common for fixed payments to be provided to affected communities at the pre-development stage to help fund the community's participation in negotiations. An example of a fixed payment system would be the developer paying a lump sum payment to support the community's negotiation process, a signing bonus after IBA negotiations are concluded, an annual payment during project construction, a bonus payment when the project commences operation, and annual payment during project operation. Two advantages of fixed payments are that they generate a stable, predictable flow of revenue and they are easy to administer. A further advantage of fixed payments is that they can provide revenue for the community even if the project is not completed if payments are required during the pre-construction phase, such as when the IBA is signed. A disadvantage is that fixed payments are insensitive to changing markets and therefore may not be effective in collecting a fair share of resource rents.

Fiscal instruments for generating community revenue:

- Fixed payments
- Cash bonus bidding
- Royalties
  - Volumetric
  - Ad valorem
  - Profit-based
    - Net income
    - Rate of return
- Property tax
- Lease fee
- Production-sharing and service contracts
- Joint ventures
- Net profits interest

4.4.2 Cash Bonus Bidding

Cash bonus bidding occurs through an auction-like process, during which the rights to extract a natural resource are auctioned to the highest bidder. Firms participating in the auction can bid an amount up to their estimated NPV of the resource site. A positive NPV indicates that the revenues from the project exceed the costs and that the project is profitable and likely to be developed. The competitive bid can be paid as a lump-sum up-front payment, a series of payments over the project's operating life or as a share of project profits. In theory, competitive bidding collects economic rents from the project, is administratively efficient, and does not reduce project benefits by reducing project investment or production. To be successful, competitive bidding requires reliable information on the resource and requires a large enough number of participating firms to ensure adequate competition. Since this fiscal instrument

requires the participation of multiple firms, it is not always appropriate for an IBA because resource projects that prompt IBAs often involve a single developer, rather than several competing developers. Another potential problem is that the project developer may have a target rate of return or discount rate that is higher than the community's discount rate. In this circumstance, the project developer will bid less for the natural resource than it may be worth to the community.

4.4.3 Royalties

Resource royalties are common fiscal instruments used to generate natural resource revenues for the resource owners. There are three primary types of royalties:

I. Volumetric

Volumetric royalties are a payment charged per physical unit of the resource being extracted, such as dollar per ounce of gold or dollar per barrel of oil. For enforcement and accuracy of payments, volumetric royalties require that the volume or weight of the resource is accurately recorded, which requires independent audits by the community or for the community to "piggyback" onto the provincial or national government's auditing process. A problem with volumetric royalties is that because they are based on the volume of production and not the value of the commodities produced, it is difficult to design a volumetric royalty to collect the fair market value or economic rent from the resource. If rates are set too high, volumetric royalties may be economically inefficient (not neutral) since they impose the same charge per unit of resource extracted regardless of the profitability of extraction. This may result in "high-grading" of the resource as companies leave lower grade resources in the ground because the royalty rate makes it unprofitable for them to be extracted. This can result in less production and less revenue for the community. If volumetric royalties are set too low, they will not collect the fair market value of the resource for the community. These problems are compounded by the fact that volumetric royalties do not adjust to market cycles in resource commodity prices. Volumetric royalties are likely to be too low during periods of high prices and too high during periods of low prices. The advantage of volumetric royalties is that they are administratively easy to implement and enforce.

II. Ad Valorem

Ad valorem royalties are based on a percentage rate of the economic value of the natural resource products sold by the project developer. The ad valorem royalty can be set at a constant rate such as 5% of the gross sales revenue or a sliding-scale rate that changes with variations in commodity prices. A potential advantage of ad valorem royalties relative to volumetric royalties is that ad valorem royalties better reflect market conditions by adjusting to changes in selling prices of the resource and, like volumetric royalties, they are relatively easy to administer. Although ad valorem royalties are more sensitive to changes in market prices than volumetric royalties, they still have a similar weakness of not being able to collect fair market value for the resource without becoming economically inefficient (not neutral). If ad valorem royalties are set at a high level to collect the rent for profitable resource projects, they may lead to "high grading" the resource because lower grades of the resource may be uneconomic to extract due to the high ad valorem royalty. This can reduce the quantity of the resource extracted as well as community revenue. If they are set low enough to minimize high grading, they might not collect fair market value for the resource and will not collect windfall rents generated during periods of high commodity prices.

III. Profit-based

<u>Net Income</u>

There are two types of profit-based royalties. The first, the net income royalty, is similar to a corporate income tax and collects a specified percentage of a project's net income. The revenue from a net income royalty will vary with the percentage rate of the royalty and the definition of 'net income', which, in turn, will vary with how revenue is

defined and what expenses the company is allowed to deduct to determine net income. For example, some royalty systems may allow companies to deduct development costs at a higher rate or deduct future exploration costs, thus reducing net income and royalty revenue in the earlier years of the project. Net income royalty revenue varies with the profitability of the project, which varies with commodity prices and production costs. Consequently, communities that rely on net income royalties share the up-side with project developers when markets are strong as well as the down-side when markets are weak or production costs are higher than projected. Communities may not be willing to bear commodity price and project cost risk associated with a net income royalty because the community may want a more stable and predictable flow of revenues to finance community needs. Net income royalties are also more difficult to administer than other royalties because they require more detailed financial information. However, net income royalties are based on the profitability of the project and therefore can be designed to collect a larger share of the economic rent with fewer negative impacts, such as high grading of the resource.

Rate of Return

The second type of profit-based royalty is the rate of return royalty. Rate of return royalties are similar to net income royalties with one major difference: rate of return royalties allow for a return on investment to be deducted from net income before the royalty is applied. The rate of return royalty is designed to tax only the economic rent from the project and is, therefore, normally set at a higher rate than a net income royalty because it applies after the project developer has already earned their return on investment. With a rate of return royalty, a specified percentage tax rate is applied to economic rent of the project. As previously stated, economic rent is defined as the revenue surplus derived after deducting all costs of production from gross revenue, including a 'normal' profit sufficient to motivate investors to develop and operate the resource project. An advantage of the rate of return royalty is that it is capable of generating larger revenues than other royalties because it is less likely to distort project operators' investment decisions that may reduce the quantity of resource extraction and is highly responsive to windfall profits. Rate of return royalties have a similar disadvantage as net income royalties in that the community bears project risks because the royalty revenue varies with the profitability of the project. This problem can be even greater for rate of return royalties relative to net income royalties, because the rate of return royalty does not collect revenue until after the investor has recovered their costs and earned a profit. Consequently, payments to the community may be deferred for multiple years after project operations have begun, unless the rate of return royalty is combined with other fiscal instruments such as fixed payments. Another disadvantage is that a rate of return royalty is difficult to administer because it requires more detailed financial information. Most communities choose not to administer rate of return royalties due to potential administrative challenges.

4.4.4 Property Tax

Property taxes are usually applied as a percentage of a site's value. The value of a site can be determined using either the NPV of the mineral reserve, the book value or depreciated book value of capital expenditures, or the market value of comparative sites. Property taxes provide stable payments to the community but, at most rates of property taxation, fail to generate significant revenue and/or capture windfall profits. Additionally, property taxes are not based on the profitability of the project and, therefore, can distort investment decisions, thus reducing project revenues.

Collecting property taxes can be complicated for local governments since natural resource extraction projects are often located outside municipal boundaries and, therefore, taxing the project is not within the jurisdiction of the community or municipal government. In this situation, it is still possible to collect property taxes by creating a satellite municipal boundary that captures the project footprint or by negotiating a grant in lieu of taxes or a property tax as part of the IBA. This grant would be based on the estimated amount of property tax the project would be paying if it was located within municipal boundaries.

4.4.5 Lease Fee

Lease fees can be used by a community to obtain relatively small but consistent revenues from holders of public resource rights. Lease fee payments depend on the size of the land area leased. The private leaseholder will pay a specified rate per hectare of leased land, often on an annual basis. Lease fees sometimes require a minimum level of investment by the leaseholder to retain the lease. Lease fees provide stable payments to the community regardless of whether the project is completed, but they are a form of fixed payments that do not vary with market conditions and, consequently, are not designed to collect economic rent.

4.4.6 Production-Sharing and Service Contracts

Production-sharing contracts (PSCs) and service contracts are types of contractual arrangements in which the project developer takes on the role of a contractor to develop the resource on behalf of the community. Although PSCs are more commonly used in the oil and gas industry, they can be used in other sectors such as mining industry as well. In a PSC or service contract, the project developer provides the technical and financial services necessary for resource exploration and development. Consequently, the extractive company bears the majority of the technical and financial risks related to the project. In a PSC, the community receives the physical product and not cash as the form of payment, while in a service contract the community receives the revenue left over after the payment to the project developer for extracting the resource. These fiscal instruments are appropriate for communities that want more direct control over the resource extraction process but do not have the capacity to develop the resource themselves. Under these contracts, the community retains ownership and control of the project. The downside is that PSCs and service contracts are administratively complex to administer from the perspective of the community.

4.4.7 Joint Ventures

Joint ventures involve the community becoming an ownership partner by investing in the project. Since the community becomes part owner of the resource project, the community will be involved in the decision-making and management processes and receive a share of the project's profits based on its share of the ownership. The trade-off is that joint ventures require the community to have a significant amount of administrative and commercial capacity and resources to finance and manage its investment in the project. The community also bears a portion of the project risk. If project costs are higher and/or revenue is lower than expected due to weak commodity prices, the community could end up incurring a net loss from the project if revenues are insufficient to cover debt servicing costs incurred to finance the community's equity investment. The community will also receive a return on only its share of the investment, thus forgoing revenue from the share of the project owned by the private developer. Therefore, joint ventures can leave a substantial proportion of the economic rent in the hands of the private developer unless additional fiscal measures such royalties are applied to the entire project

The primary negotiable stipulation for joint ventures is what percentage share the community will purchase and what the purchase price will be. Related to this, the community must decide how it will finance its investment. In some cases it may be unrealistic for the community to have sufficient financial capital for an up-front investment, meaning that it will have to negotiate a loan from the project developer or government that will be paid off over a period of time from the revenue generated from the resource project.

4.4.8 Net Profits Interest

A net profits interest is an agreement in which the community receives a specified share of the project's net profits, similar to the joint venture arrangement, without actually investing capital in the project. In effect, the net profits interest is conceptually similar to a net income royalty, although the formula for collecting the royalty share and the net profits interest share may be different.

5

Business Strategies to Minimize Payments to IBA Communities

Communities negotiating IBAs should be aware of business strategies that companies may use to hide profits and reduce payments to governments and communities. The most common strategies used by companies to reduce payments involve the use of transfer pricing, which is a technique used for shifting profits from one part of the company to another part of the company to reduce its tax burden. There are several ways that companies can achieve this. First, the producing company can sell its resource or intermediate mineral product to a related company for a below market sales price. This reduces the producing company's declared revenue from the resource project. Second, the producing company can purchase goods and services from a related company at inflated prices, thereby artificially increasing its costs and decreasing its declared profits. Third, a parent company can provide a loan to a producing subsidiary to finance a natural resource project and charge an interest rate that reduces the subsidiary's net income, even all the way to zero. This technique is also referred to as "thin capitalization". These techniques to reduce reported profits of the producing company can result in the company paying less in taxes and royalties to the community and various levels of government. It is important that IBA signatories and other governments independently audit and monitor private companies to prevent underreporting of project profits through transfer pricing. This can be achieved by using fair market index prices for determining sales revenue, costs, and financing charges in the IBAs in instances where the company's financial data may not represent fair market value due to intra-company transfer pricing. For communities without monitoring capability, the rule "tax what you observe" should be followed. Following "tax what you observe" means that communities should design their royalties to tax variables that are already monitored and publicly reported, such as those used to calculate royalties or income taxes paid to provincial or national governments.

Project developer tax avoidance:

Although considered by many to be unethical, some project developers could use strategies to decrease their tax payments, and, consequently, their payments to the community. Some strategies that the project developer can use include:

- Selling the resource to a related company for below market prices.
- Purchasing goods and services from a related company at inflated prices.
- Receiving a loan from a related company with an above market interest rate.

6

Evaluation of Alternative IBA Fiscal Regimes

In this section, seven IBA fiscal instruments are evaluated using an economic model based on a representative copper and gold mine. The evaluation is designed to test alternative fiscal instruments under a range of market conditions. The fiscal instruments tested include fixed payments, an ad valorem royalty, a volumetric royalty, a profit-based royalty, and a joint venture investment (Table 2). The parameters of the fiscal regimes were determined based on a review of existing IBA and government revenue collection measures applied to the mining sector (see Appendix E).

The financial model assumptions and parameters used to test the fiscal instruments are based on a recently constructed mine located in northern BC (Red Chris mine). This mine primarily produces copper, with an approximate production volume of 75 million pounds per year. The mine also produces gold, with an approximate production volume of 33,000 ounces per year. The project lifetime is 29 years: 4 years of construction and 25 years of operations. The capital costs of the project are estimated to be $450 million and the operating costs are estimated to be $190 million per year. Revenue from the mine is based on the forecast prices for minerals and production of the mine. Three scenarios are used for forecasted prices: a base case that uses annual year-end prices of gold and copper over the previous ten years (2008 to 2017)[23] converted to 2018 Canadian dollars, a low-price case that uses prices 10% lower than the base case, and a high-price case that uses prices 10% higher than the base case. In all three price scenarios, prices vary from year to year consistent with the market price cycles experienced during the previous ten years (year-end prices from 2008 to 2017). The data used to develop the mine model are taken from publicly available information reported by the company[24].

The seven fiscal instruments are evaluated and ranked using the following five criteria defined in Table 2:

1. Revenue generation
2. Administrative efficiency
3. Neutrality of impact on project investment and production decisions
4. Revenue stability
5. Decision-making power.

Table 2. IBA Fiscal Instruments

Fiscal Instrument	Fiscal Regime Parameters
Fixed payments	• Fixed payments - Up-front: $20 million, Construction: $5 million/yr for 4 yrs, Annual: 250,000/ yr for 25 yrs
Ad valorem royalty	• Royalty rate- 1.2% of gross revenue
Volumetric royalty	• Royalty price per volume of production - Copper- $0.04/lb, Gold- $16.12/oz
Net income and rate of return royalty	• Royalty rates - Tier 1: 2% of net income. Tier 2: 13% of net income. Tier 1 royalty rates apply until the project investment is recovered. After project investment is recovered, the royalty rate rises to Tier 2 (13% of net income). Tier 1 payments are deductible from Tier 2 royalty payments.
Fixed payments/ad valorem royalty	• Fixed payments - Up-front: $20 million, Construction: $5 million/yr for 4 yrs, Annual: 250,000/ yr for 25 yrs • Ad valorem royalty - 1.2%
Hybrid regime combining fixed payments, ad valorem royalty and net income/rate of return royalty	• Fixed payments - Up-front: $20 million, Construction: $5 million/yr for 4 yrs, Annual: 250,000/ yr for 25 yrs • Ad valorem royalty - 1.2% • Rate of return royalty - Tier 1: 2%, Tier 2: 13%. Tier 1 royalty payments are deductible from Tier 2 royalty payments.
Joint Venture	• 20% community equity financed by a loan based on a 25-year repayment schedule and an interest rate of 4%. Dividends are paid to the community annually - equivalent to 20% of the net cash flow of the mine (after tax and interest payments).

Note: These fiscal instruments and parameters are based on the review of current IBAs summarized in Appendix E.

6.1 Revenue Generation

As previously discussed, this criterion refers to the amount of revenue that the fiscal regime is capable of generating over the lifetime of the project. An optimal fiscal regime will maximize the revenue and proportion of rent received by the community. Revenue generation is measured in two ways: total revenue and the share of economic rent. The share of economic rent is an important indicator because it shows what proportion of the value of the natural resource the community is collecting. The results are summarized in Figure 2 and Figure 3.

Figure 2 shows the range of revenue under three different commodity price scenarios based on different market conditions: a low price, reference price, and high price. The results in Figure 2 are the NPVs of the total payments to the community from the project. As discussed previously, NPV refers to revenue received by the community, brought into the present using a specified discount rate (which in this case is 10%).[25]

The results (Figure 2) show that the hybrid regime, which combines fixed payments, an ad valorem royalty, and a profit-based royalty, generates the most revenue for the community ($80 million under the reference price). This result is not surprising, since the hybrid regime consists of a combination of multiple instruments. The volumetric royalty generates the least revenue for the community ($17 million). Revenue estimates for cash bonus bidding are not provided in Figure 2, but under perfect conditions, cash bonus bidding could in theory collect the entire rent from the project, estimated at just under $300 million. However, revenue generated under competitive bidding is likely to be lower than this due to imperfections in the bidding process such as a limited number of companies willing to bid.

A sensitivity analysis was performed to calculate how these revenues and rents change when the market prices of copper and gold change. For the hybrid regime, total community revenue can range between $63 million and $100 million, indicating that the hybrid regime adjusts well to changes in market conditions (Figure 2). Community revenues do not change with changes in commodity prices for fixed payments or the volumetric royalty because these are not based on project profits. The joint venture shows the potential risks and rewards of becoming a joint venture partner. The community incurs interest and principal repayment charges to cover the cost of the loan required to finance the equity investment. Under base case and high price market conditions, the share of net income from the project should be high enough to repay the loan and generate a net return on the investment. However, under weak market conditions, the share of net income may be insufficient to cover the costs of the loan and the community may incur an overall loss.

It is interesting to note that the proportion of the rent collected under the various fiscal regimes ranges from a high of 27% under the hybrid regime to a low of 7% under the volumetric royalty (Figure 3). For all fiscal regimes, a significant proportion of the rent is retained by the project developer and other levels of government, indicating a potential for communities to collect more revenue by increasing royalty rates in the IBA beyond those used in the evaluation.

All of the revenue generation estimates are based on the assumption that the project is built. If the project is not completed, then the ad valorem royalty, the volumetric royalty, the profit-based royalty, and the joint venture would not generate any revenue for the community. Fixed payments, however, would still generate some revenue even if the project is not completed as long as the fixed payment schedule is structured to require payments at various milestones prior to project completion such as when the IBA is signed.

Several qualifications should be noted when interpreting these revenue results. First, the results will vary depending on the specific characteristics of the project being assessed and therefore it is important to undertake a detailed analysis of each specific project. Second, it is possible to increase revenue generated in each fiscal regime by increasing royalty rates or, in the case of the joint venture, changing the terms of the investment and loan financing. However, although royalty rates could in theory be increased to generate more revenue under each fiscal regime, increasing royalty rates may not generate the anticipated revenue increase because higher rates could adversely affect production output by encouraging high grading and/or discouraging investment. The capacity to increase revenue by increasing royalty rates is therefore limited by the relative fiscal neutrality of each instrument. Therefore, neutrality, which is discussed in a separate section below, is an important consideration in assessing revenue potential.

6.2 Administrative Efficiency

This criterion refers to the capacity of the community (expertise, time, and money) that is required to implement each fiscal instrument or regime. The hybrid regime and the joint venture involve the most administrative challenges. The hybrid regime requires higher administrative capacity to implement, audit, and monitor since it includes an ad valorem royalty and a profit-based royalty that require detailed financial information and verification of financial records. The joint venture requires the administrative capacity to finance and manage the joint investment in the project. A fixed payments fiscal instrument is the easiest to administer since it does not require auditing or monitoring on the community's part. One way of increasing administrative efficiency is to rely on a senior government's royalty system by setting the IBA fiscal regime royalties as a percentage of the senior government royalty payments. This way the senior government is responsible for administering the royalty and the community can 'piggyback' on the senior government's system.

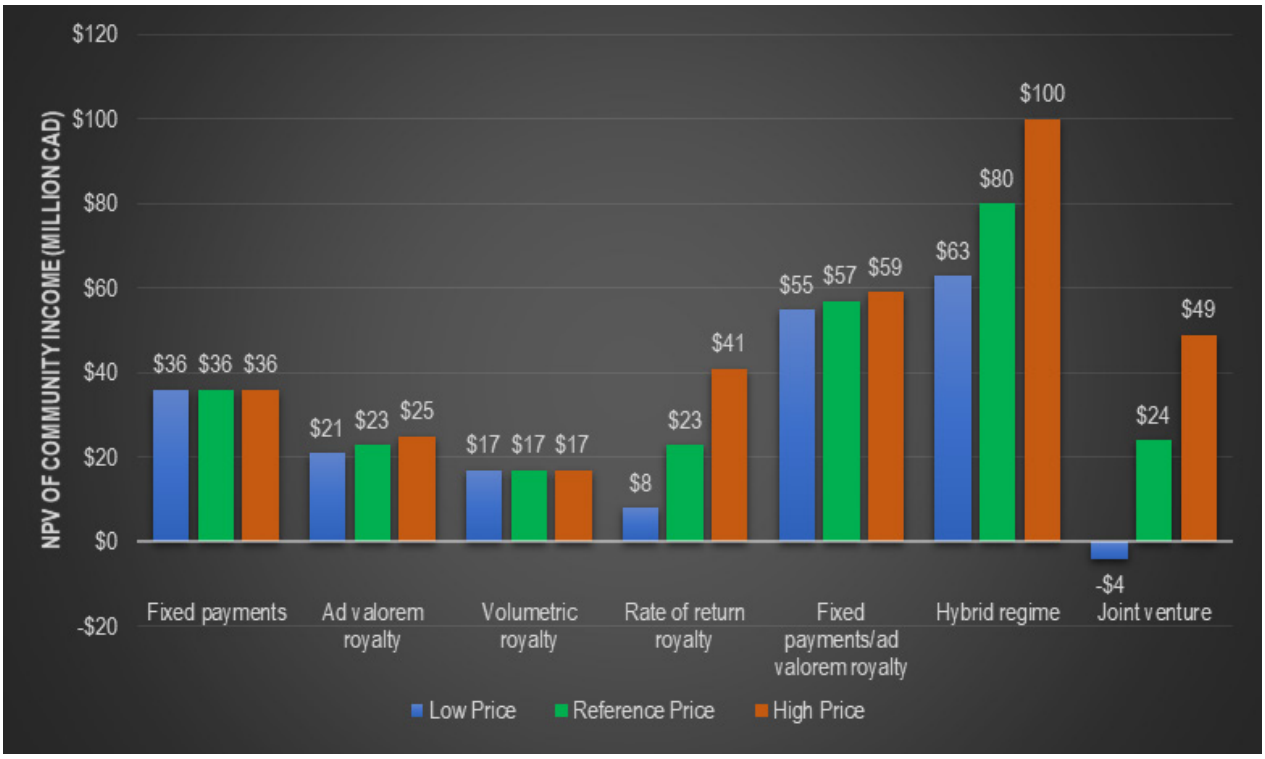


Figure 2. NPV of community income generated by each fiscal instrument (2018 Can $).

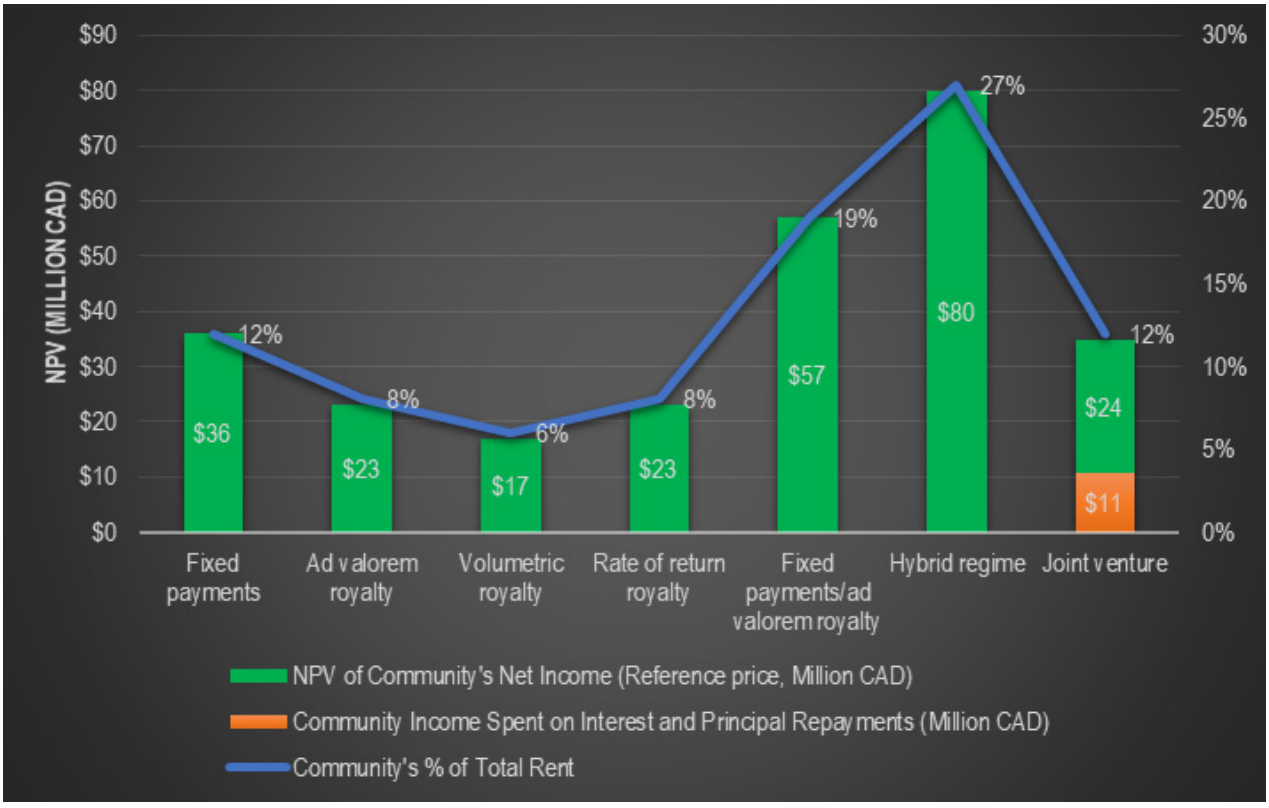


Figure 3. Community NPV and percentage of total rent under each IBA scenario

6.3 Neutrality

This criterion refers to the potential impact that the fiscal regime may have on the project developer's business decisions. A neutral fiscal regime is one that does not distort or alter investment or operational decisions that reduce the overall project production and benefits. A neutral fiscal regime will only capture the economic rent generated by a project. The fiscal instruments that are the most neutral are cash bonus bidding, joint ventures, and rate of return royalties, given that these instruments should not alter any of the production or investment decisions of the project operator because they allow the operator to cover all costs including a return on capital. The ad valorem royalty and the volumetric royalty are the least neutral fiscal regimes since they are not designed to capture economic rents and may result in high grading of the natural resource by charging the same royalty on low grade deposits as high grade deposits. Fixed payments should be neutral once the project is built because the payment is not related to production and therefore is unlikely to have any impact on production decisions that could lead to high grading of the resource. However, if the fixed payments are set too high, this may result in the project not being constructed.

6.4 Income Stability

This criterion refers to the variability of income received by the community over the lifetime of the project, from the beginning of the construction phase to the end of the operating phase.[26] The objective is to provide a relatively stable and predictable minimum annual payment to the community over the project's life to provide the community with increased certainty regarding the revenue flow. As seen in Figure 4, fixed payments have the highest income stability. As well, fixed payments have the added potential advantage of providing revenue even if the project is not completed as long as payments are required during the pre-construction phase. The profit-based royalty and the joint venture generate relatively unstable income flows because the community revenue is dependent on project profitability that varies from year to year. The variability in revenue for most fiscal regimes shows that communities should be cautious in forecasting revenue inflows and avoid committing to ongoing expenditures of IBA revenues that cannot be sustained.

6.5 Decision-Making Power

This criterion refers to the amount of project decision-making power that a community has under a given fiscal regime. The joint venture arrangement can provide the community with decision-making power depending on the percentage share owned by the community. All of the other fiscal instruments provide a low level of decision-making power for the community. However, decision-making powers could be negotiated as part of management provisions

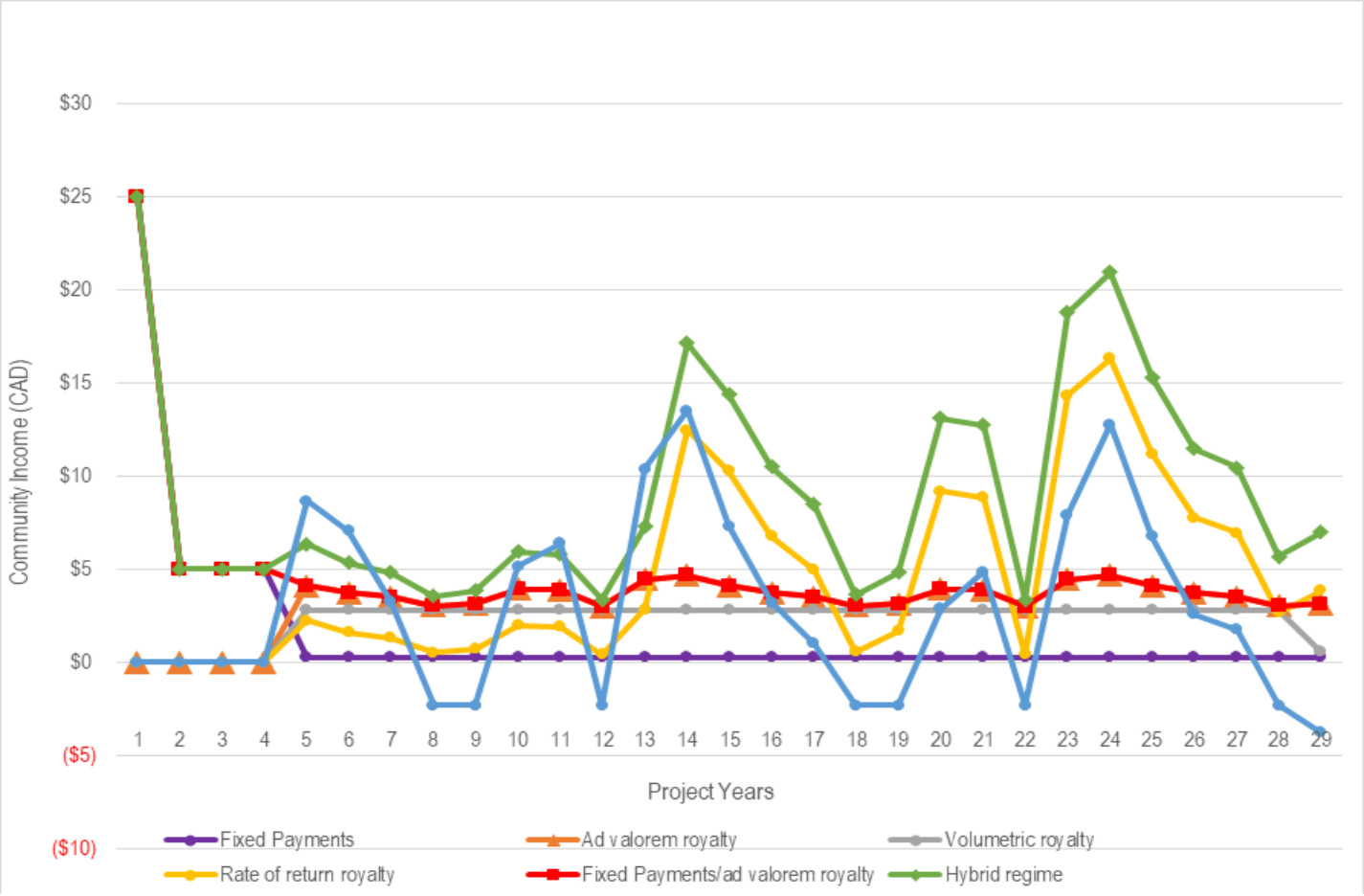


Figure 4. Annual community revenue generated by each fiscal instrument

7

Designing the Fiscal Regime of the IBA

7.1 Evaluating Fiscal Instruments

An evaluation summary for each fiscal instrument is presented in Table 3. Under each criterion, each fiscal instrument receives one of three scores: high (green), medium (yellow), or low (red). The ratings show that each instrument has advantages and disadvantages and no instrument is ideal in terms of fully meeting all the criteria.

Fixed payments rate high in terms of income stability and administrative efficiency and medium in terms of revenue generation and neutrality. Fixed payments also have the added benefit of generating revenue even if the project is not completed as long as payments are required during the pre-construction phase. Cash bonus bidding has a high rating for revenue generation and neutrality. But although cash bonus bidding has the potential to generate the most revenue, the conditions necessary for effective bidding, such as a large number of bidders and accurate information on project parameters, may be difficult to meet. The volumetric and ad valorem royalties have a medium rating for revenue generation, a high rating for stability of revenue flow and administrative efficiency, but a low rating for neutrality, which indicates that the royalty rates, and consequently the revenue generation, cannot be increased without adversely impacting production. The net income and rate of return royalties have a low rating for income stability and administrative efficiency, a medium rating for revenue generation and high rating for neutrality. The administrative challenges of the net income and rate of return royalties can be reduced if communities are able to 'piggyback' on senior government royalty systems by calculating community royalty payments as a percentage of senior government payments. The hybrid regime, which combines three fiscal instruments (fixed payments, an ad valorem royalty, and a rate of return royalty), combines the benefits of several instruments and therefore receives a high rating in terms of revenue generation and income stability, and a medium rating in terms of neutrality and administrative efficiency. The revenue in the hybrid regime can also be increased by increasing the rate of return component, which is relatively neutral and therefore should not impact investment or production decisions, while the administrative challenges can be reduced by piggybacking on senior government royalties. The joint venture option and production sharing options are the best in terms of increasing community control over the project's operations, but they are complex to administer and the revenue flow is highly unstable.

The evaluation shows that the choice between alternative fiscal instruments will require trade-offs between community objectives. For example, fiscal regimes that maximize the revenue accruing to the community tend to be more difficult to administer and result in lower income stability. Alternatively, fiscal regimes that are easier to administer, such as volumetric and ad valorem royalties, have lower revenue generating potential and may impact project benefits by affecting investment and production decisions. Hybrid regimes that use a combination of instruments are likely the most

effective because they can combine the benefits of different instruments into a single fiscal regime. But regardless of which instruments are chosen, each instrument or combination of instruments has different advantages and disadvantages, and it is therefore important for the community to prioritize its objectives and develop a fiscal regime that meets its needs.

Table 3. Evaluation of Fiscal Instruments

Fiscal Instrument	Evaluation Criteria				
	Revenue Generation	Admininistrative Efficiency	Neutrality	Stability of Income	Decision-making Power
Production-sharing and Service Contracts					
Joint Venture					
Fixed Payments					
Cash Bonus Bidding					
Volumetric Royalty					
Ad valorem Royalty					
Net Income Royalty (profit-based)					
Property Tax					
Lease Fee					
Rate of Return Royalty (profit-based)					
Hybrid Regime (Fixed payments, ad valorem royalty, and rate)					

Performance: High Medium Low

7.2 Incorporating Non-Revenue Benefits into IBAs

While revenues paid to the community are the primary subject of this Guidebook, there are other potential benefits that are important to consider when developing an IBA. As noted in Part 3 of this Guidebook, IBAs often include commitments for the project developer to provide additional benefits such as hiring employees from the community, purchasing goods and services from community businesses and contractors, providing community infrastructure, and mitigating adverse project impacts. Negotiation of these benefits needs to be integrated with the negotiation of revenue measures because each benefit incurs a cost that will impact the amount of rent and ability of the project developer to fund other benefit provisions. There are, therefore, trade-offs that the community may have to make between alternative benefit provisions.

Evaluating each benefit to the community and assessing its impact on the ability to obtain other benefits in IBA negotiations can be challenging. For example, if the project will employ 600 workers and 100 are hired from the community, the project developers will often cite the 600 employees as a benefit of the project without distinguishing between jobs filled by in-migrants from those filled by community residents. Even if the project developer uses the measure of 100 workers hired from the community, this may still be overstating the benefit if these 100 community workers are already employed in other jobs. The valid measure of the employment benefit to the community is the net increase in community wages and community employment, not the total wage bill.[27]

It is also important to estimate the cost to the project developer of hiring local workers and using local contractors. The developer would need to hire workers and purchase goods from suppliers regardless of whether they come from the community or not. Therefore, hiring local workers and using local suppliers should not be considered as a concession by the project developer in the IBA negotiations unless these initiatives increase the costs of the project. Only the potential increased costs should be viewed as a concession provided by the project developer in the IBA negotiation that impacts the ability of the developer to fund other benefits.

Valuing the benefits of the project developer providing community infrastructure or mitigating adverse environmental impacts in IBA negotiations is also important. Provision of community infrastructure by the project developer is a cost to the developer that represents a concession in the IBA negotiations that reduces the ability to fund other benefits. However, the benefit to the community may be lower than the cost to the developer if the community places a lower value on the infrastructure than the cost of building it. In this case, the community may be better off if it received the money that the developer was going to spend on infrastructure and used it for other investments that are more valuable to the community.

These examples illustrate several key points that communities should take into account when negotiating other non-revenue benefits in an IBA. First, the valuation of costs and benefits of non-revenue benefits can vary significantly between the developer and the community. Consequently, it is essential in IBA negotiations for the community to estimate the costs and benefits of each component from the perspective of the community and the project developer. Second, the community should use this information to assess what can be termed the "opportunity cost" of each provision from the community's perspective. Opportunity cost is defined as what the community gives up by each provision of the IBA, keeping in mind that there is a maximum limit to what the project developer is able to provide based on the economics of the project. Asking for one provision in an IBA, such as providing more infrastructure, will restrict the project developer's ability to provide other benefits to the community, such as increasing royalty payments. Therefore, it is important for the community to negotiate all the provisions in the IBA as an interdependent package to maximize overall community benefits.

A simple example will help illustrate the role of these concepts in negotiating an IBA. Assume that the proposed IBA for a mining project contains the following five types of benefits as outlined in Table 4: revenue payments, local hiring, local purchasing, provision of infrastructure, and environmental mitigation. The costs to the project developer of providing these benefits to the community and the value of the benefits to the community are summarized in Table 5. The proposed mine, which uses the reference case mining model described in Part 7, is projected to generate $300 million in rent estimated as the NPV of the mine over the life of the project. This rent represents the maximum amount

of revenue that could be collected from the project developer while still leaving sufficient returns for the project to be economically viable. The total cost of the IBA provisions to the project developer in the example is $85 million, leaving $215 million of rent to be retained by investors. In the example, the community could theoretically collect higher revenues from the project up to a maximum of $300 million depending on their bargaining power and other factors such as the project developer's view of risk. But it is important to note that there is a maximum that can be collected in the form of benefits and increasing one IBA benefit provision could reduce the ability of the developer to provide other benefits.

It is also important to note that the valuation of benefits can vary significantly by the type of benefit provided (Table 5). The incremental cost to the project developer of employing community residents and using local suppliers, for example, is considerably lower than the gross cost because the developer would incur most of these costs to operate the mine, regardless. In the example, it is assumed that the project employs 150 community residents at the same wage rate it would have paid in-migrants. The only extra cost to the company is the cost of training the community residents for the jobs, which in the example is assumed to be $50,000 per employee. The benefit to the community of these new jobs is the increase in the wages, which in the example are assumed to increase from the current level of $50,000 per year per employee to $100,000 per year, resulting in a benefit to the community of $67 million over the life of the mine. The total incremental cost to the developer of providing community employment is just $7 million (the NPV of the training costs), which is much lower than the total wages paid to the 150 community hired workers. The community benefit to cost ratio of hiring local employees is 9.7, calculated by dividing the $67 million benefit to the community by the $7 million cost to the developer. The provision of infrastructure provided by the developer in the example has a lower benefit cost ratio (0.5) because it is assumed that the community's valuation of the benefits of the infrastructure is lower than the cost to the developer to build it. Therefore, the community could increase the net community benefits from the IBA by increasing community employment and reducing infrastructure spending. The community also has room to increase the magnitude of benefit provisions given the sizable rent ($215 million) still available after funding the IBA benefits (Table 6).

The valuation of costs and benefits will vary from community to community based on community preferences and project parameters. The example therefore should be viewed as simply an illustration of some of the issues and concepts that the community should be cognizant of when negotiating an IBA and communities should undertake their own detailed assessments to determine the benefit and cost valuations for IBA provisions. But what the example shows is that it is important for the community to estimate the economic rent available to fund IBA provisions and to disaggregate the costs and benefits of each proposed IBA provision from the perspective of the community as well as from the perspective of the project developer. The community should negotiate benefit provisions as an integrated package and focus on the provisions with the highest benefit to cost ratios to maximize overall net community benefits.

Table 4. IBA Benefit Provisions

Benefits Components	Description
Monetary Payments	$20 million upfront payment, $5 million/year for 4 years construction, and $250,000 per year of operation from year 5 to mine closure.
Employment	150 employees for mining operations are hired from the community. Average compensation per employee is $100,000, beginning when the mine starts production in year 5. Training costs are $50,000 per employee, paid by company in year three. Pre-project income of employees hired at mine is $50,000, resulting in a net benefit per employee of $50,000/employee/year (increase in employee income).
Infrastructure	A $15 million payment to fund a community centre and an expanded road system built in year 3.
Environmental Mitigation	$23 million to offset adverse environmental impacts and to redesign tailing ponds to reduce risk of leakage spent in year 3.
Local Purchases	20% of company purchases are local, equal to $5 million per year during operation (year 5 to closure). Local purchases are 10% more expensive to project relative to using non-local suppliers. Local suppliers' net incremental cost is 50% of incremental purchase revenue, resulting in net community benefit of local purchases of $2.5 million per year beginning in year 1.

Table 5. Evaluation of Benefit Provisions for Mine

Benefit	Cost to Company (millions of $)	Benefit to Community (millions of $)	Community Benefit/ Cost Ratio
Fixed Payment	$36	$36	1.0
Local Employment	$7	$68	9.7
Local Purchases	$5	$22	4.6
Infrastructure	$14	$7	0.5
Environment	$23	$23	1.0
Total	$85	$157	1.9

Table 6. Total Project Rent Distribution

	(Millions of $)
Total Project Rent Available (before IBA)	$300
Total Cost of IBA to Developer	$85
Total Project Rent Remaining after IBA	$215

7.3 Guidelines for Negotiating a Fiscal Regime

Based on the review of IBA literature and the analysis in this report, it is recommended that communities use the following guidelines in developing the fiscal regime for their IBA:

1. Develop explicit community objectives and conduct a comprehensive evaluation of the project to determine if the project should be supported or rejected;
2. Develop a proposed fiscal regime based on community priorities and objectives. The optimal fiscal regime will vary from community to community and from project to project. There is no one optimal regime that applies to all circumstances;
3. Integrate the design of the fiscal regime with the design of other proposed IBA components to allow for assessment of trade-offs between various benefit provisions such as employment, local purchases, and community infrastructure;
4. Negotiate a precursor agreement with the project developer that includes funding support to undertake an economic evaluation of the proposed project and a financial evaluation of alternative fiscal instruments and other benefit provisions similar to the evaluation framework used in this Guidebook;
5. Ensure that the IBA provides funding through a fixed payment schedule at various stages of project development, such as a bonus payment for signing an IBA, to provide community revenue even if the project is not completed;
6. Develop and weight the relative importance of the community fiscal objectives which could include revenue generation, administrative efficiency, neutrality, income stability, and decision-making power;
7. Undertake a preliminary assessment of fiscal options and other IBA benefit options relative to community objectives to determine which options best meet the community's objectives;
8. Develop a financial feasibility model of the proposed project and use the model to test alternative fiscal regimes and other benefit options such as local hiring, local contracting, provision of community infrastructure and environmental mitigation relative to community objectives and project developer financial returns. Then, disaggregate costs and benefits from the perspective of the project developer and the community to identify the benefit provisions with the highest benefit to cost ratios to determine the optimal mix of benefit provisions that maximizes the overall net benefit for the community;
9. Use the results of the model and community objectives to develop the preferred fiscal regime and other benefit provisions in the IBA. The preferred fiscal regime will likely use a combination of fiscal instruments including fixed payments that are made throughout the project lifecycle from pre-project planning to site remediation, a profit-based royalty, and a volumetric or ad valorem royalty. The rates of the royalties combined with the other benefit provisions contained in the IBA should be set to collect most of the economic rent from the project;
10. Evaluate options for reducing the administrative burdens on the community by 'piggybacking' some of the IBA revenue provisions on senior government royalty systems where possible. For example, instead of designing and administering its own royalty, the community could collect a percentage of the revenue collected under an existing senior government royalty;
11. Based on negotiations, finalize and approve the fiscal regime and the other IBA benefit provisions to be incorporated in the IBA and ensure that the fiscal regime and other benefit provisions are legally enforceable by having the IBA reviewed by legal experts hired by the community;
12. Include monitoring and auditing provisions in the IBA to assess the performance of the fiscal regime and other benefit measures to ensure that it is meeting its objectives and revise the regime as required; and
13. Ensure that all aspects of the IBA and IBA negotiation process meet best practice guidelines (provided in Appendix A).

8

Conclusion

The recommendations and the fiscal tools discussed in this Guidebook are intended to bridge the knowledge and technical capacity divide that often separates major industry actors and senior governments from the communities impacted by resource projects. As stated in the introduction, the purpose of the Guidebook is to assist communities and regions with the negotiation of IBAs that provide a fair distribution of revenues from major resource development projects. Admittedly, the concept of 'fair' is a highly relative and context dependent variable in the negotiation process. For this reason, the opportunity to engage in comparative studies with existing IBAs, as facilitated by ongoing fiscal tool and other IBA research, is also important. Raising the level of collective knowledge concerning negotiation options and case examples of IBAs will enable better outcomes for all parties.

As noted, this Guidebook focuses on revenue measures to be included in IBAs to fill a current gap in the IBA literature. Non-revenue issues, such as how to structure IBA negotiations and management systems and how to protect ecosystem services or enhance or protect cultural capital are equally important issues in IBA negotiations. For this reason, this Guidebook should be used in concert with other resource materials that address these other community objectives. It is also important that communities utilize technical advisors who are familiar with the concepts and methods of financial and benefit cost analysis outlined in this Guidebook and the financial modeling to assist them in IBA negotiations. We also invite interested parties to review additional IBA resources and recommendations located on our project website: http://www.sfu.ca/rem/planning/research/IBA.html.

Endnotes

Endnotes

1. See for example: Browne & Robertson, 2009; Gordon Foundation, 2015; Szoke-Burke et al., 2018; World Bank, 2012
2. See for example: Adebayo and Werker, 2020
3. Guj, 2012; Guj, Bocoum, Limerick, Meaton, & Maybee, 2013; International Monetary Fund, 2012
4. Garnaut & Clunies Ross, 1983; Guj, 2012; Guj et al., 2013; Gunton & Richards, 1987; International Monetary Fund, 2012; Johnston, 1994
5. Gunton, 2017; Oxfam Australia, 2010
6. Land, 2009; Markey & Heisler, 2011
7. Alberta Department of Energy, 2007; Otto et al., 2006
8. Markey & Heisler, 2011; Segal, 2012
9. Söderholm & Svhan, 2015
10. Cooney, 2017; Dupuy, 2014; Sosa & Keenan, 2001
11. United Nations General Assembly, 2007
12. Oxfam Australia, 2010
13. In Canada, for example, there have been a number of successful court challenges. See for example: Haida (2004), Taku River (2004), and Mikisew Cree (2005).
14. Natural Resources Canada, 2018
15. O'Faircheallaigh, 2015; O'Faircheallaigh & Gibson, 2012
16. There are several guides that discuss the how to ensure that that IBAs are legally enforceable. See for example: Szoke-Burke et al., 2018
17. Hira et al., 2020
18. For a more detailed description of the IBA process see Gordon Foundation, 2015
19. CCSI (2018)
20. See Government of British Columbia (2019)
21. Criteria adapted from: Guj, 2012; Guj et al., 2013; International Monetary Fund, 2012; Johnston, 1994
22. For more information on these fiscal instruments see: Guj, 2012; Guj et al., 2013; International Monetary Fund, 2012; Johnston, 1994
23. World Bank, 2019;
24. Imperial Metals Corporation, 2017
25. Note that the private investors discount rate or target rate of return of 10% used here may be higher that the communities or 'social' discount rate, which can be much lower. If a community discount rate of around 3.5% is used, for example, the rent generated by the project would be much higher. However, the project would not be developed at the social discount rate by the private investor.
26. In practice, it is possible for the community to negotiate payments at different stages of the project, such as the exploration phase or when the final investment decision is made. Payments at these stages, however, were not included in this analysis.
27. See: Shaffer (2010) for a discussion of these and other issues in defining benefits and costs.
28. For the results of the study see: Cascadden, Gunton & Rutherford (2020).
29. The design of this model was based off the IMF Fiscal Analysis of Resource Industries model (2016) and the CCSI Benchmarking Gold Mining Fiscal model CCSI (2016).

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Appendix A

Appendix A. IBA Best Practices Guidelines Checklist

The following best practice guidelines for creating IBAs is based on an extensive study of IBA best practices.[28]

Criteria	Sub-Criteria	Indicator	Verbal Rating*	Numeric Rating*	Recommendations
1. Empowering	1.1 Every affected community is a participant in the IBA-making process.	i. All communities with legal rights impacted by the project are consulted.			
		ii. All communities with unrecognized legal rights impacted by the project site are consulted.			
		iii. All communities who may experience downstream effects of the project are consulted.			
	1.2 Vulnerable and marginalized groups are included in the IBA-making process.	i. Women, youth, or elder groups impacted by the project are consulted in the IBA-making process.			
		ii. The IBA community negotiation team includes representatives from marginalized interests (i.e., the team included representatives from marginalized groups whose support was required for approval of the IBA)			
	1.3 Community sovereignty is maintained.	i. The community retains all of its rights, such as governance, access to land and resources, participation in regulatory processes, and land monitoring powers, in the IBA.			

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Criteria	Sub-Criteria	Indicator	Verbal Rating*	Numeric Rating*	Recommendations
	1.4 IBA funds are managed by the recipient community.	i. All funds paid to the community under the IBA are managed by the recipient community.			
	1.5 The community has its own goals and development plan, which the project is only a part of.	i. The impacted community has its own long-term development plan for the area.			
		ii. The development plan was prepared prior to commencement of IBA negotiations and IBA negotiations are guided by the community objectives in the development plan.			
2. Respects Local Culture	2.1 Project employees take part in cross-cultural training.	i. There is cross-cultural training available to project employees.			
		ii. Cross cultural training is mandatory for all employees.			
	2.2 Traditional or community knowledge is included in the project design and management.	i. Traditional knowledge is collected or known by the project designers.			
		ii. Traditional knowledge is used to design the project.			
	2.3 Employment schedules accommodate community members' cultural needs.	i. Employee work schedules are designed to suit cultural needs.			

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Criteria	Sub-Criteria	Indicator	Verbal Rating*	Numeric Rating*	Recommendations
3. Affirmation	3.1 The IBA is negotiated in good faith.	i. There is evidence that the agreement was a signed in good faith, such as a signed agreement clause.			
	3.2 The community-company relationship is trusting and is maintained.	i. The community and the company see each other as trustworthy.			
		ii. There are regularly scheduled face-to-face interactions between company employees and community members.			
	3.3 The agreement is seen as legitimate by the community.	i. The negotiator or negotiation team representing the community is accountable to and approved by the community.			
		ii. The agreement is formally approved by the community by a community vote.			
	3.4 The company is committed to the agreement's success.	i. Employees, including upper-level management, formally affirm their commitment by signing the IBA or by some type of collective formal declaration indicating their support for the IBA.			
	3.5 The role of an IBA in the project approval process is clear.	i. Project approval is contingent on concluding an IBA with the impacted communities.			

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Criteria	Sub-Criteria	Indicator	Verbal Rating*	Numeric Rating*	Recommendations
	3.6 The IBA does not replace government's role in supporting the community.	i. Government services and government funding for the community is not reduced as a result of an IBA.			
4. Open Communication	4.1 A precursor agreement, such as a memorandum of understanding, is signed.	i. There is a signed, public precursor agreement that provides a framework for IBA negotiations.			
		ii. The precursor agreement outlines the objectives and process of negotiating an IBA.			
	4.2 The IBA, precursor agreement (if available), monitoring results and all other IBA relevant information are public.	i. The IBA precursor agreement and is publicly available.			
		ii. The IBA is publicly available.			
		iii. The IBA's monitoring results are publicly reported on a regular basis.			
		iv. The IBA and monitoring results are available in the local language(s).			
	4.3 Communication between signatories continues throughout project operation.	i. There are regularly scheduled meetings that community members and company employees can attend to discuss IBA performance and project management issues.			

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Criteria	Sub-Criteria	Indicator	Verbal Rating*	Numeric Rating*	Recommendations
		ii. Community members and company employees are able to discuss all matters and grievances at these meetings.			
		iii. If needed or requested communication is done in the locally spoken language(s).			
	4.4 There is continuity in who is involved with the IBA making and implementation process.	i. There is staff continuity throughout IBA negotiation and IBA implementation.			
		ii. New staff are required to complete an IBA orientation program comanaged by the community and company.			
5. Capacity Building	5.1 Each party's capacity is assessed	i. The capacity of the community to participate in IBA negotiations and manage the IBA is assessed by the community and any capacity constraints are identified.			
		ii. Parties have sufficient time to fully prepare for negotiations.			
		iii. The community develops a plan to address all identified capacity constraints prior to commencement of IBA negotiations.			

Criteria	Sub-Criteria	Indicator	Verbal Rating*	Numeric Rating*	Recommendations
	5.2 Capacity building initiatives exist and are funded	i. There is sufficient funding and resources to address community capacity constraints.			
		ii. Sufficient resources are provided for job training.			
		iii. Sufficient resources are provided to develop community governance capacity necessary for management of the IBA.			
		iv. Sufficient resources are provided for local business development.			
	5.3 There is a dedicated person in charge of employment and training of the local community.	i. There is a dedicated person accountable to the community in charge of employment and training of the local community members.			
	5.4 Capacity building provisions should be locally available.	i. There are job training and capacity building initiatives provided within the community.			

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Criteria	Sub-Criteria	Indicator	Verbal Rating*	Numeric Rating*	Recommendations
6. Equity	6.1 No community member is worse off as a result of the project, after mitigation and compensation.	i. There are provisions to ensure that any member of the community adversely impacted by the project is fully compensated for the adverse effect.			
	6.2 Financial benefits are scaled to the total project benefits.	i. Financial benefits for the community are assessed as a proportion of total financial project benefits.			
		ii. Financial benefit payments to the community are based on the overall project profitability.			
	6.3 Financial benefits are delivered to suit community needs.	i. The financial payment benefit formulas are consistent with community objectives for a stable and predictable flow of payments.			
	6.4 Contracts are designed for, and favour, local businesses.	i. Local businesses have an advantage in the contract bidding processes.			
		ii. Contracts are unbundled to allow for small local business participation.			
		iii. There are measurable targets for contracting with local business.			

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Criteria	Sub-Criteria	Indicator	Verbal Rating*	Numeric Rating*	Recommendations
	6.5 Community members are preferentially hired.	i. There are provisions with measurable targets and milestones that require hiring community members.			
		ii. There are provisions with measurable targets and milestones that support advancement of community members into higher skilled and higher paying positions.			
		iii. There are provisions with measurable targets and milestones that support retention of community members in the project workforce.			
7. Enforceability	7.1 The IBA includes a dispute resolution mechanism.	i. There is a provision for dispute resolution in the IBA.			
		ii. Dispute resolution is co-managed by the community and project representatives.			
		iii. The dispute resolution process provides for a mutually agreed on arbitration process to resolve the dispute if the parties to the IBA cannot agree on a resolution.			
	7.2 The IBA is a legally binding document.	i. The IBA is legally binding.			

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Criteria	Sub-Criteria	Indicator	Verbal Rating*	Numeric Rating*	Recommendations
		ii. All provisions in the IBA are written in a manner to ensure that they are legally enforceable.			
		iii. The IBA has been reviewed by legal experts representing the community.			
	7.3 The IBA is jointly governed with a clearly outlined framework.	i. There is a clear IBA governance structure that outlines who is responsible for managing each component of the IBA.			
		ii. The IBA is jointly governed by community and project representatives.			
	7.4 The IBA's provisions have measurable targets.	i. All provisions in the IBA have measurable targets and milestones.			
	7.5 There are penalties for non-compliance with the IBA.	i. There are penalties for non-compliance with the IBA.			
8. Effective Implementation	8.1 Each provision is included in an implementation plan.	i. Each provision in the IBA has an implementation plan that shows milestones, resources (funding and personnel), and the party responsible.			

Criteria	Sub-Criteria	Indicator	Verbal Rating*	Numeric Rating*	Recommendations
	8.2 There is funding for IBA implementation.	i. There is sufficient funding to implement employment, business contracting, environment and culture protection, financial, training and education, community development, and closure and reclamation provisions.			
	8.3 There is an overseer of IBA implementation.	i. There is a person or committee in charge of implementing the IBA.			
		ii. The implementation person or committee is paid.			
		iii. The implementation person or committee is accountable to both the community and the company.			
	8.4 The implementation process is collaboratively designed.	i. The community and the company collaborate to design the IBA implementation process.			
		ii. Each party's role in IBA implementation is made clear.			

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Criteria	Sub-Criteria	Indicator	Verbal Rating*	Numeric Rating*	Recommendations
9. Monitoring and Adaptability	9.1 Progress towards IBA objectives and project impacts are periodically monitored.	i. There is a monitoring plan.			
		ii. All provisions and impacts are monitored on a regularly scheduled basis.			
		iii. Monitoring is done with appropriate metrics relevant to the objectives and targets.			
	9.2 The community and the company jointly monitor the project and the IBA.	i. All IBA signatories comanage monitoring.			
	9.3 A baseline assessment of the environmental, cultural, and socioeconomic conditions of the community is conducted.	i. There is a baseline environmental assessment.			
		ii. There is a baseline socioeconomic assessment.			
		iii. There is a baseline cultural assessment.			
		iv. The community is involved in all the baseline assessments.			
	9.4 There is funding for monitoring.	i. There is adequate funding for monitoring provided in the IBA.			

Criteria	Sub-Criteria	Indicator	Verbal Rating*	Numeric Rating*	Recommendations
	9.5 IBA deficiencies that have been identified in monitoring must be mitigated.	i. There is a provision in the IBA requiring any deficiencies identified in monitoring results to be mitigated.			
	9.6 There is a process for amending the agreement.	i. There is a process by which the parties can re-open the IBA for negotiation.			
10. Breadth	10.1 The IBA addresses all project phases: construction, operation, and closure and reclamation.	i. The IBA addresses the construction, operation, closure, and reclamation phases of the project.			
		ii. There is a closure and remediation plan.			
		iii.The community comanages project closure and reclamation.			
		iv. Ownership of all project related infrastructure after project closure is clearly defined.			
	10.2 The IBA contains provisions dealing with: employment, business contracting, training and education, financial payments to the community, cultural protection, and environmental protection.	There are provisions in the IBA covering community involvement in the following activities:			
		i. Employment.			
		ii. Business contracting.			
		iii. Training and education.			
		iv. Financial payments to community.			

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Criteria	Sub-Criteria	Indicator	Verbal Rating*	Numeric Rating*	Recommendations
		v. Cultural protection.			
		vi. Environmental protection.			
* verbal and numeric rating: fully met (3), largely met (2), partially met (1), not met (0)					

Appendix B

Appendix B. Mine Model Outline and User Guide

Outline

The purpose of this model is to provide a comparative assessment of the different fiscal instruments commonly utilized in IBAs and their ability to generate income for communities. The model specifically compares the present values of the estimated economic rents that accrue to the community, the federal and provincial governments, and the project developer. Its intended audience is any party that could potentially be affected by a proposed resource project and/or has resource ownership rights and should benefit from a proposed project; however, ideally the model would be shared by all parties so that negotiations regarding IBA fiscal instrument and regime design are rooted in a common understanding.

It is important to note that this model is representative of a standard copper and gold producing mine in northern BC. That being said, with appropriate adjustments to the key inputs, the model can be adapted to a variety of mineral extraction projects.

The structure of this model is based on dynamically connected income statement, balance sheet, and cash flow statement forecasting models.[29] Mine revenues are derived from the mineral volumes extracted and sold at the market commodity prices. Associated mine expenses (including taxes and IBA payments) are then incorporated into the model on either a fixed or variable basis. Finally, capital costs and the associated funding mechanisms are added to complete the project cash flow analysis. Mine economic rents are the NPV of the project derived using the definition previously outlined in section 1.3 of this Guidebook. These rents are then further segregated into those collected by the community, federal/provincial government, and project developer.

The model ignores discrepancies between the timing of revenue and expense recognition and actual cash flows. For example, it is assumed that all minerals extracted are sold immediately and that the project developer holds no inventory or accounts receivable. Similarly, it is assumed that expenses are paid as they accrue and there are no accounts payable. This may result in some inconsistencies between the forecasted and actual project developer and community revenues on a year to year basis, but over the lifetime of the mine this will have little impact on project developer and community revenues.

Separately, the model calculates the revenues and economic rents generated by the community and the federal/provincial government through their employment of IBA fiscal instruments and regimes.

The resulting summary outputs of the rent distributions are then presented in tables and graphs in the 'Key Outputs' worksheet. The full mine model is available at: http://www.sfu.ca/rem/planning/research/IBA.html

Appendix B

User Guide

Overview

The model is composed in Microsoft Excel and is intended to be edited and used in Microsoft Excel. There are six worksheets in the model, all of which are linked together by formulas. The general flow of the model starts with the "Key Inputs" worksheet, where the model input variables and assumptions can be adjusted. From there the model moves to the "Ref" (reference or base case scenario) tab, where the project economics are detailed and the distribution of economic rents is calculated. The "Low", "High", and "Cap Cost Overrun" worksheets provide the same functionality as the "Ref" worksheet, but are used for sensitivity analyses. The "Low" and "High" worksheets specifically account for scenarios in which the mineral prices are 10% lower and 10% higher, respectively, than the "Ref" scenario. The "Cap Cost Overrun" worksheet illustrates a scenario in which the mine capital costs are 30% higher than in the "Ref" scenario. Finally, the "Key Outputs" worksheet summarizes the results and provides visual aids. Conceivably, users that have little or no experience with models, and prefer to keep things simple, can focus on only using the "Key Inputs" and Key Outputs" worksheets. Users that have more experience with models, or that want a more detailed review of model metrics, should feel free to analyze the "Ref", "Low", "High", and "Cap Cost Overrun" worksheets.

Editing

Changes to the input variables can be made by editing the cells highlighted in light blue in the "Key Inputs" worksheet. Changes to the assumptions and input variables should only be made in the "Key Inputs" tab. Cells in white contain formulas which should not be edited by inexperienced modellers, as changing them may result in the model not functioning properly. In the "Ref" and other analysis worksheets, the cells highlighted in light blue refer back to the cells in "Key Inputs" worksheet. The cells in light green are typically the sum total of a line item over the lifetime of the mine project. These cells are not intended to be edited.

Input Assumptions

Input assumptions play a critical role in the accuracy of the modelled results. Care must be taken to ensure that the values inputted into the light blue cells in the "Key inputs" worksheet are reasonably accurate and either grounded in forecasted or historical data or based on comparable project parameters. The key input assumptions are as follows:

Mining Company

- Copper Production: The volume of the primary mineral (in this case, copper, in pounds [lbs]) expected to be extracted and sold annually over the life of the mine. This information would typically be based on proven geologic reserves, mine operating forecasts, and/or comparable mines. Care must be taken to ensure that the units used to measure volume are the same units that are commonly used for the mineral commodity pricing.
- Gold Production: The volume of the secondary mineral (in this case, gold, in ounces [oz]) expected to be extracted and sold annually over the life of the mine.
- Copper Price: The expected sale price of the primary mineral sold. This will typically be based on historical or forecasted commodity price figures; however, if a mine regularly employs non-market pricing strategies such as hedging or offtake agreements, then the commodity price used in the model should reflect this. It is also important to be consistent with the currency used in the model. Note that mineral prices are more commonly presented in US dollars. A rolling 10-year historical Canadian dollar copper price trend has been used for the results presented in the Guidebook. The low and high commodity prices

are linked to the sensitivity scenarios in the "Low" and "High" worksheets, respectively. All input costs in the model are translated into constant year dollars to remove impacts of inflation.

- Gold Price: The expected sales price of the secondary mineral sold.
- Per Unit Operating Cost: The cash costs of production per unit (in this case per pound) of the primary mineral produced. This figure should include direct labour, operating materials and supplies, equipment and mill costs, applicable overhead, and any other on-site operating costs. This input is one of the most important variables in the model as the operating costs are often the biggest cost a mine has and have a significant impact on a mine's rent generating ability.
- Annual Contribution to Reclamation: The annual amount that the mine sets aside to fund the reclamation liability at the end of mine's life.
- General and Admin Costs: The mine's administrative costs expressed as a percentage of sales.
- Treatment/Refining/Transport Costs: The cash costs per pound of the primary mineral produced attributable to off-site activities such as extracting the mineral from the ore and delivering it to the end market. Technical factors such as the grade of ore and logistical factors such as rail and truck capacity will affect these cost figures.
- Initial Capital Expenditure: The capital required to build the mine and its accompanying infrastructure before operations can commence. These costs will typically be incurred in the first few years of the mine's life; however, if planned expansions occur at different points in the mine's life cycle these can be incorporated into the model within this field.
- Cost Overrun Capital Expenditure: The factor by which initial capital costs exceed the normal, or expected, capital costs. This factor is linked to the "Cap Cost Overrun" worksheet to provide a capital cost range as part of a sensitivity analysis.
- Capital Depreciation Rate: The rate at which mine assets are depreciated (using the straight-line method). The standard capital cost allowance for class 41 mine assets in Canada is 25%. Note that historically, some class 41(a) assets used in a mining operation qualify for accelerated depreciation (up to 100%), but this allowance will be phased out in Canada after 2020.
- % Debt Project: The debt percentage of the total capital structure (in relation to equity). The capital structure determines how the mine's capital costs are funded.
- Interest Rate: The annual interest rate payable on the mine debt.
- Years to Maturity: The amortization period on the mine debt.
- Equity Returns: The annual dividends (expressed as a percentage of net income), payable to mine operating company shareholders.

Community

A detailed description of the different IBA fiscal instruments can be found in the Guidebook. Some of the key points in relation to the modelling of specific fiscal instruments are described below:

- Profit-Based Royalty: The profit-based royalty utilizes the same two-tiered taxation regime as described in the government section below; however, the model is built so that profit-based royalties derived from an IBA are paid out after government royalties are paid. It is assumed that the tier 1 and 2 royalty percentages will typically be the same as the government percentage.

- Equity Share: This input variable is relevant when a community enters into a joint venture agreement with the project developer. An equity investment (or, joint venture ownership stake) in the mine results in a change in the mine's equity funding structure. The private mine equity amount is proportionally reduced by the amount of the community's investment. It is assumed that the equity investment will be made before construction of the mine begins. Corresponding to this investment, it is also assumed that the community will take on a loan equivalent to the size of their investment to fund their ownership stake. The model has inputs for the amortization period of the loan, the interest rate of the loan, and the targeted cash equity return (i.e., dividend distributions). The equity return is expressed as a percentage of net income and is proportional to the percent value of the equity investment (e.g., a 20% equity investment with a 50% targeted equity return on $100,000 in annual net income will result in a cash distribution of $10,000 annually ($100,000*50%*20%)). It is worth noting that an equity investment is structurally different than the other fiscal instruments as the dividends that are derived from the equity investment constitute a distribution of the resource rents. Furthermore, all or a portion of the capital invested may remain within the mine for as long as the mine is operational, while the loan would be repaid over the mine's lifetime. This could result in a negative cash flow situation for the community. The dividends received from the equity investment may not be sufficient to repay the annual loan obligations.
- Lump Sum Deductible from Royalty: If this field is set to "Yes" the lump sum payments will be deducted from the amounts payable via the "Volumetric", "Income Based Royalty", and "Ad Valorem" fiscal instruments. If this field is set to "No", the lump sum payments will not be deducted.

Government

- Mining Tax Tier 1: Some jurisdictions, such as BC, impose mining taxes in two tiers. In the case of BC, the first tier is a tax on the mine's "net current proceeds" and is set at 2%. This input should not be adjusted unless the provincial government updates its taxation regime. The tier 1 mining tax is deductible from the tier 2 tax.
- Mining Tax Tier 2: In the case of BC, the second tier is a tax on the mine's "net revenue" and is set at 13%. This input should not be adjusted unless the provincial government updates its taxation regime.
- Corporate Income Tax: The corporate income tax rate used in the model is the combined Canadian federal and provincial income tax rate.
- Property Tax: The property, or mineral land, tax is set at the BC provincial mandated tax rate per hectare. This input can be adjusted by determining the size of the mine (in hectares [ha]) and the corresponding provincial tax rate per hectare.
- Note that all of the government tax parameters discusses above are based on the BC provincial and federal tax regimes and will have to be amended to reflect the tax regimes for the jurisdiciton in which the project is being proposed.

Appendix C. Model Outputs

Model Scenarios

Scenario	Fiscal Instrument
1	Fixed payments
2	Ad valorem royalty
3	Volumetric royalty
4	Profit-based royalty
5	Fixed payments/ad valorem royalty
6	Hybrid regime
7	Joint venture

Appendix C

Price Scenario	Indicator	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7
Low Market Price Scenario	Total Revenue to Community ($MM)	46	83	67	47	123	170	-24
	NPV of Payments to Community ($MM)	36	21	17	8	55	63	-4
	% of Total Rent Captured	34%	20%	16%	8%	52%	60%	9%
	% of Total Discounted LOM Revenue	2.1%	1.2%	1.0%	0.5%	3.2%	3.7%	0.6%
Reference Market Price Scenario	Total Revenue to Community ($MM)	46	92	67	132	132	264	86
	NPV of Payments to Community ($MM)	36	23	17	23	57	80	24
	% of Total Rent Captured	12%	8%	6%	8%	19%	27%	12%
	% of Total Discounted LOM Revenue	1.9%	1.2%	0.9%	1.2%	3.0%	4.2%	2.0%
	Coefficient of Variation Throughout Project (%)	292	43	44	104	86	63	163
	Minimum Annual Community Income Throughout Project ($MM)	0	0	0	0	3	3	-4

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Price Scenario	Indicator	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7
Reference Market Price Scenario	Maximum Annual Community Income Throughout Project ($MM)	25	5	3	16	25	25	14
	Coefficient of Variation During Production Phase (%)	0	14	16	90	14	57	147
	Minimum Annual Community Income During Production Phase ($MM)	0	3	1	0	3	3	-4
	Maximum Annual Community Income During Production Phase ($MM)	0	5	3	16	5	21	14
High Market Price Scenario	Total Revenue to Community ($MM)	46	101	67	217	141	358	185
	NPV of Payments to Community ($MM)	36	25	17	41	59	100	49
	% of Total Rent Captured	7%	5%	4%	8%	12%	21%	12%
	% of Total Discounted LOM Revenue	1.7%	1.2%	0.8%	1.9%	2.8%	4.8%	3.0%

Appendix D. Summary of Base Metal IBA Fiscal Provisions

The IBA Fiscal Instrument and Regime Database was filtered to obtain the ten IBAs negotiated for base metal mining operations. Below is a summary of the fiscal instruments and rates found within the ten base metal mining IBAs. The summary chart below does not include payments which:

- Occur due to project delays or suspension
- Depend on internal budgeting processes or matching contribution
- Come directly from a government entity that is not a signee in a bilateral IBA.

IBA	Resource(s) Extracted	Fiscal Tool(s)	Rate	Triggering Factor and Conditions
Mary River Project Inuit Impact Benefit Agreement, Nunavut, Canada	Iron ore	Single fixed payment	$5,000,000 CAD	On date IBA is signed.
		Single fixed payment	$5,000,000 CAD	Within 5 days of project receiving Water License.
		Single fixed payment	$10,000,000 CAD	Within 5 days of construction decision.
		Single fixed payment	$750,000 CAD	Single payment.
		Multiple fixed payments	$1,250,000 CAD	Starts 1 year after construction decision. Payment in each calendar quarter. Payment stops when commercial production begins.
		Multiple fixed payments	$1,000,000 CAD	Yearly payment for the first 2 years of agreement.
		Multiple fixed payments	$250,000 CAD	Yearly payment staring when the agreement comes into effect. Payment stops when commercial production begins.
		Multiple fixed payments	$25,000 CAD	Yearly payment.
		Ad valorem royalty	1.19%	Yearly. Starts when either: 30 years of commercial production has elapsed OR when 1 billion tonnes of iron ore have been mined.

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IBA	Resource(s) Extracted	Fiscal Tool(s)	Rate	Triggering Factor and Conditions
The Raglan Agreement, Quebec, Canada	Nickel, copper, cobalt, platinum, palladium	Single fixed payment	$1,000,000 CAD	Within 30 days of project authorisation.
		Single fixed payment	$1,000,000 CAD	Within 30 days of the start of commercial production
		Multiple fixed payments	$300,000 CAD	Yearly for 5 years. Starts the first year of commercial production.
		Multiple fixed payments	$300,000 CAD	Yearly for 5 years. Starts the first year of commercial production.
		Multiple fixed payments	$500,000 CAD	Yearly for years 6-10.
		Multiple fixed payments	$800,000 CAD	Yearly. From year 11 onwards.
		Multiple fixed payments	$250,000 CAD	Yearly. Starts the first year of commercial production.
		Profit-based royalty	4.5%	Paid yearly. Calculated monthly.
Stk'emlupsemc of the Secwepmc Nation Economic and Community Development Agreement, British Columbia, Canada	Gold, silver, copper	Profit-based royalty	37.5%	Paid yearly by a provincial government. The specified percentage is a proportion of Mineral Tax Revenue received by government.
Lower and Upper Similkameen Indian Bands Economic and Community Development Agreement, British Columbia, Canada	Copper	Profit-based royalty	35%	Paid yearly by a provincial government. The specified percentage is a proportion of Mineral Tax Revenue received by government.
Nak'azdli First Nation Economic and Community Development Agreement, British Columbia, Canada	Copper, gold	Profit-based royalty	12.5%	Paid yearly by a provincial government. The specified percentage is a proportion of Mineral Tax Revenue received by government.

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IBA	Resource(s) Extracted	Fiscal Tool(s)	Rate	Triggering Factor and Conditions
Williams Lake Indian Band Economic and Community Development Agreement. British Columbia, Canada	Copper, gold	Profit-based royalty	18.5%	Paid yearly by a provincial government. The specified percentage is a proportion of Mineral Tax Revenue received by government.
Kwadacha Economic and Community Development Agreement, British Columbia, Canada	Gold, copper	Profit-based royalty	11.67%	Paid yearly by a provincial government. The specified percentage is a proportion of Mineral Tax Revenue received by government.
Cooperation Agreement	Gold, copper	Multiple fixed payments	$6,500,000 CAD	Yearly.
Kainantu Gold Mine Project (Memorandum of Agreement), Papua New Guinea	Gold, copper	Ad valorem royalty	1.4%	Yearly. Rate levied on Free on Board price.
		Ad valorem royalty	0.5%	Yearly. Rate levied on Free on Board price.
		Single fixed payment	140,000 Papua New Guinea Kina	Unspecified
		Single fixed payment	20,000 Papua New Guinea Kina	Unspecified
		Single fixed payment	30,000 Papua New Guinea Kina	Unspecified
		Single fixed payment	25,000 Papua New Guinea Kina	Paid when mine construction starts.
		Single fixed payment	60,000 Papua New Guinea Kina	Paid during mine construction.
		Single fixed payment	140,000 Papua New Guinea Kina	Unspecified
		Single fixed payment	60,000 Papua New Guinea Kina	Unspecified
		Single fixed payment	60,000 Papua New Guinea Kina	Unspecified
Ramu Nickel/ Cobalt Project (Memorandum of Agreement), Papua New Guinea	Nickel, cobalt	Ad valorem royalty	1.3%	Yearly. Rate levied on Free on Board price
		Investment return	5% project equity	
		Single fixed payment	1,000,000 Papua New Guinea Kina	Unspecified
		Multiple fixed payments	100,000 Papua New Guinea Kina	Yearly. Payment begins when agreement comes into effect. Payment ends when the first royalty payment is made to the State of Papua New Guinea.

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IBA	Resource(s) Extracted	Fiscal Tool(s)	Rate	Triggering Factor and Conditions
** Note: The IBAs associated with the Kainantu Gold Mine Project and Ramu Nickel/Cobalt Project are from Papua New Guinea. As such, the revenue is shared to impacted communities by the State of Papua New Guinea. The indicated ad valorem rates for both of these agreements has been converted to reflect the proportion of mineral value which flows to the impacted communities. Originally, these values were expressed as a proportion of the ad valorem royalty which the State of Papua New Guinea collects from a base metal project – as stipulated within Papua New Guinea's Mining Act, 1992.