

Managing mining for sustainable development

A SOURCEBOOK

UNDP Bangkok Regional Hub and
Poverty-Environment Initiative Asia-Pacific
of UNDP and UN Environment

April 2018

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Resilient nations.*



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Foreword

Minerals and metals are essential materials for the functioning of modern societies and economies. Mining provides great economic opportunities for resource-rich countries. However, the process of mining creates challenges and risks for the well-being of people and the environment. A key challenge for these countries is to manage mining in a way that contributes to – and does not jeopardize – sustainable development.

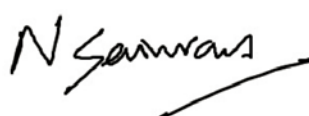
The management of mining at all stages, from exploration to mine closure requires serious consideration of social and environmental impacts. The legal and contractual frameworks that govern mining are often made with little consideration of environmental sustainability and the well-being of affected communities. The rights of local communities and indigenous people to have a say in decisions about mining projects are often not realized. Most countries have adopted rules on environmental and social impact assessment and mine closure, but the implementation of these rules is lagging behind.

Moreover, countries and communities often do not access the full economic benefits of mining. Governments may lack the capacity to estimate returns from mining and negotiate mining taxes. Even when they do collect fiscal revenues from mining, they face challenges with the volatility of these revenues and investing these resources into sustainable development. People and local businesses may not be able to take advantage of the job opportunities and business development potential that come from mining.

This sourcebook brings together existing knowledge, experiences and tools to help equip governments and communities in resource-rich countries and regions to manage mining in

a way that is consistent with their aspirations for sustainable development. The premise of this sourcebook is that it is within the power of governments of resource-rich countries to protect people and the environment and to realize the benefits from mining, working alongside the mining industry and local communities.

Much of the available knowledge on social and environmental sustainability concerns related to mining is produced by and for the mining industry, while most available knowledge products for governments are focused on the economic governance of mining. By synthesizing knowledge on the environmental, social and economic aspects of mining in a way that is relevant for governments and communities in resource-rich countries and regions, this sourcebook fills an important gap.



Nik Sekhran
Director
Sustainable Development
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Abbreviations and Acronyms

AETR	Average Effective Tax Rate	EPCM	Engineering, Procurement and Construction Management
AMD	Acid Mine Drainage	ESIA	Environmental and Social Impact Assessment
ASI	Aluminium Stewardship Initiative	FARI	Fiscal Analysis of Resource Industries
BBOP	Business and Biodiversity Offsets Programme	FDI	Foreign Direct Investment
BC	Bettercoal Code	FPIC	Free, Prior and Informed Consent
BRH	Bangkok Regional Hub (of UNDP)	GATT	General Agreement on Tariffs and Trade (of WTO)
CBA	Cost-Benefit Analysis	GDP	Gross Domestic Product
CBD	Convention on Biological Diversity	GHG	Greenhouse Gas
CCCMC	China Chamber of Commerce of Metals, Minerals and Chemicals Importers and Exporters	GIA	Gender Impact Assessment
CCSI	Columbia Center on Sustainable Investment	HIA	Health Impact Assessment
CDA	Community Development Agreement	HRIA	Human Rights Impact Assessment
CEA	Cumulative Environmental Assessment	IBA	Impact Benefit Agreement (Canada)
CFCs	Chlorofluorocarbons	ICMC	International Cyanide Management Code
CIA	Cumulative Impact Assessment	ICMM	International Council on Mining and Metals
CIRDI	Canadian International Resources and Development Institute	IFC	International Finance Corporation
CR	Corporate Responsibility	IGF	Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development
CSIRO	Commonwealth Scientific and Industrial Research Organization (Australia)	IIED	International Institute for Environment and Development
CSR	Corporate Social Responsibility	IISD	International Institute for Sustainable Development
CSRМ	Centre for Social Responsibility in Mining, The University of Queensland (Australia)	ILO	International Labour Organization
DICA	Directorate of Investment and Company Administration (Myanmar)	IMF	International Monetary Fund
EFA	Environmental Financial Assurance	IMO	International Maritime Organization
EIA	Environmental Impact Assessment	IPRA	Indigenous Peoples' Rights Act (the Philippines)
EIS	Environmental Impact Statement	IRMA	Initiative for Responsible Mining Assurance
EITI	Extractive Industries Transparency Initiative	ISO	International Standards Organization
EMP	Environmental Management Plan	LDC	Least Developed Country
EPC	Engineering, Procurement and Construction	LRTAP	Convention on Long-Range Transboundary Air Pollution

METR	Marginal Effective Tax Rate	UNCTAD	United Nations Conference on Trade and Development
MGI	McKinsey Global Institute	UNDP	United Nations Development Programme
MMDA	Model Mining Development Agreement	UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
MMSD	Mining, Minerals and Sustainable Development	UNEP	United Nations Environment Programme (now UN Environment)
MOU	Memorandum of Understanding	UNFCCC	UN Framework Convention on Climate Change
NAP	National Action Plan on Business and Human Rights	VAT	Value-Added Tax
NGO	Non-Governmental Organization	VCC	Vale Columbia Center on Sustainable International Investment (currently CCSI)
NHRC	National Human Rights Commission	WBCSD	World Business Council for Sustainable Development
NOAMI	National Orphaned/Abandoned Mines Initiative (Canada)	WCMC	World Conservation Monitoring Centre
NRGI	Natural Resource Governance Institute	WEF	World Economic Forum
OECD	Organisation for Economic Co-operation and Development	WTO	World Trade Organization
PEI	Poverty-Environment Initiative (UNDP-UNEP)		
PWYP	Publish What You Pay		
RJC	Responsible Jewellery Council		
SDG	Sustainable Development Goal		
SDSN	Sustainable Development Solutions Network		
SEA	Strategic Environmental Assessment		
SESA	Strategic Environmental and Social Assessments		
SIA	Social Impact Assessment		
SIDA	Swedish International Development Cooperation Agency		
SLO	Social Licence to Operate		
TRIMs	Trade-Related Investment Measures Agreement (WTO)		
UN	United Nations		
UNGP	UN Guiding Principles on Business and Human Rights		
UNCED	United Nations Conference on Environment and Development		

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Executive summary



ES

The extraction of minerals from the earth presents opportunities, challenges and risks to sustainable development. Minerals are essential for human well-being and are fundamental for virtually all sectors of the economy. However, mining also presents critical challenges and risks for sustainability. Mineral resources are finite and non-renewable, at least in human or biological timescales. Environmental and social problems and risks posed by mining are increasingly generating conflicts between mining companies and local communities. With declining ore grades for most minerals, the resource intensity and the amount of waste generated per unit of resource produced is likely to increase, and the associated environmental costs will prove a constant and growing challenge.

Mining activities can also contribute to sustainable development, particularly to its economic dimension. It can bring fiscal revenues to a country, drive economic growth, create jobs and contribute to building infrastructure. Thus, mining has both positive and negative implications for the Sustainable Development Goals (SDGs), with particularly strong impacts on 11 of the 17 the SDGs (Figure ES1).^A

Efforts to mitigate environmental impacts, protect human rights, promote social inclusion and enhance benefits from mining for development should be taken throughout the life of a mine and the whole value chain of mining. The impacts of mining are best understood when viewed through the various phases in the life of a mine: mineral exploration, mine development, mining operations and mine closure. Therefore, this sourcebook adopts a “life of a mine” approach (Figure ES2), which allows identifying concrete actions that governments and other stakeholders can take at different phases of mining.

FIGURE ES1. MINING AND THE SDGS



Source: Adapted from CCSI, SDSN, UNDP and WEF 2016.

FIGURE ES2. MAIN IMPACTS DURING THE LIFE OF A MINE

MINERAL EXPLORATION	MINE DEVELOPMENT	MINING OPERATIONS	MINE CLOSURE
<ul style="list-style-type: none"> Limited, but escalating impact as exploration progresses. 	<ul style="list-style-type: none"> Limited impact during studies, assessment, planning, but future impacts and mitigation opportunities are 'locked' at this stage. Major environmental and social impacts during mine construction. Surge in demand for jobs. Resettlement, displacement, in-migration. 	<ul style="list-style-type: none"> Major environmental and social impacts, depending on the nature and scale of the deposit and mining method. Demand for jobs, goods and services. Fiscal revenue flows. 	<ul style="list-style-type: none"> Winding down of operations lead to reduced impacts, but can leave lasting environmental legacies and social dislocation Loss of jobs and fiscal revenues

Source: Adapted by authors based on sources cited throughout this sourcebook

1. CCSI, SDSN, UNDP, and WEF 2016.

2. Hard law includes laws and other legally binding instruments, whereas soft law includes quasi-legal instruments such as customary law that are not legally binding.



Orienting legal frameworks towards sustainable development

In this section:

- The domestic legal framework
- Mining contracts
- International treaties, conventions and soft law
- Voluntary standards
- Customary rules

The legal and normative framework of mining encompasses the domestic legal framework of host countries (countries where mining takes place), mining contracts, international hard and soft laws,² voluntary standards by the mining industry and customary rules. These elements of the legal, regulatory and normative framework are often inconsistent with each other and have critical gaps, particularly in areas that are essential for the protection of the human rights and livelihoods of people affected by mining. Addressing these gaps and inconsistencies is essential to improve the environmental and social outcomes of mining activities and to protect the human rights of those affected by mining. Coordination within the government is necessary to ensure that the legal, regulatory and normative framework is implemented in a coherent manner and in ways that are consistent with promoting environmental sustainability and sustainable social and economic development.

The domestic legal framework in mining, which consists of constitutions, laws, policies and regulations, needs to be coherent with international laws and norms, as well as customary rules practised in the country.

Mining contracts, usually entered with large investors, constitute another key element of the normative framework of mining in many resource-rich countries. However, developing countries with

less developed domestic legal frameworks tend to rely on contracts to fill legal and regulatory gaps. This may not be consistent with the public interest. Instead of a contract-based regime, a law-based regime is preferable, because it is more transparent, is applicable equally to all investors, and creates less burden for the government in administering, monitoring and enforcing. Contracts with mining investors can also limit the policy space for adopting more progressive laws and regulations that mitigate the negative environmental and social impacts and enhance the fiscal and economic benefits from mining to host countries. If contracts need to be used, then countries should limit contract terms that are open to negotiation, consider the adoption of model mining agreements, and ensure public disclosure of mining contracts.

The normative framework of mining is also shaped by international law, including international investment treaties, human rights laws and standards, and environmental conventions and treaties. Bilateral investment treaties, while important for attracting investment into host countries by protecting investors' rights may be protected at the expense of the public interest and human rights in the host country. Thus, countries such as Ecuador, India and Indonesia have started assessing, revising and renegotiating or cancelling investment treaties they are party to.

International human rights instruments include both hard laws and soft laws. The core instruments for the protection of human rights – the International Covenant on Civil and Political Rights and the International Covenant on Economic, Social and Cultural Rights, as well as the ILO Convention No. 169 on the Rights of Indigenous Peoples, are key international law instruments relevant for mining. The main relevant soft law instruments are the United Nations Declaration on the Rights of Indigenous Peoples and the UN Guiding Principles on Business and Human Rights. Governments should make their domestic laws and regulations consistent with their international human rights commitments; they should also seek to incorporate principles and guidance from soft laws into their legal and regulatory framework to protect people affected by mining.

Similarly, various instruments in international environmental law should be taken into account

in shaping the domestic legal framework and the environmental regulation of the mining industry. These include conventions and treaties on mineral waste, water quality, nature preservation, biodiversity, air pollution and climate change.

Voluntary standards and codes adopted by the mining industry on environmental and social performance may exert a strong influence on the actions of mining companies and in this regard also constitute part of the normative framework. A major report commissioned by the mining industry in 2002, “Mining, minerals and sustainable development” (MMSD), critically examined the industry’s performance related to the environmental and social impacts, human rights, local development and fiscal contributions of mining. The report gave rise to many initiatives promoting responsible mining, including standards on environmental and social performance. Governments can make use of voluntary standards by the mining industry to strengthen domestic standards.

Customary rules form another important element of the normative framework relevant for mining. Customary land tenure systems, regulated through customary rules, are prevalent in many developing countries and indigenous territories. However, customary tenure systems are often not recognized by the law or are insecure. The insecurity of land rights defined by customary rules comes to the fore when mineral resources are discovered and mining development starts in these areas. As a result, people can be displaced, dispossessed and impoverished. Safeguarding the rights of indigenous peoples and other peoples over communal lands – such as forests and pastures – is important not only for protection of human rights; it is increasingly recognized as important for the sustainable management of these lands. The Voluntary Guidelines on the Responsible Governance of Tenure have been endorsed by the Committee on World Food Security. They provide guidelines for governments on strengthening land tenure systems, including recognition and protection of the legitimate tenure rights of people and communities with customary tenure systems.

This sourcebook makes recommendations to governments based on the experiences of countries, and on international normative instruments and standards.

RECOMMENDATIONS

Orienting legal frameworks towards sustainable development

Making domestic laws and regulations coherent with each other and sufficiently detailed to function as the core set of instruments for governing mining

Improving coordination between government agencies and between national and subnational governments

Considering moving from contract-based regimes to law-based regimes, avoiding using mining contracts to fill legal and regulatory gaps

Considering establishing model agreements which provide the policy space for environmental and social laws of the country, and limiting terms that are open to negotiations

Where mining contracts are made, paying special attention to provisions related to environmental impact mitigation, mine closure, resettlement, local content and employment

Ensuring transparency of mining contracts, including disclosure of beneficial ownership

Assessing implications of international investment treaties on the country’s commitments to sustainable development, human rights and the domestic policy space; negotiating terms in investment treaties to minimize these negative implications

Incorporating or strengthening the principles of consultation with local communities and free, prior and informed consent (FPIC) in domestic laws and regulations; and establishing or strengthening state remedy mechanisms for people affected by mining

Making use of voluntary standards developed by and for the mining industry, encouraging responsible mining investments and recognizing companies that adhere to strong standards

Recognizing and progressively registering customary land rights to protect poor and marginalized rural communities and indigenous peoples.



Protecting the environment and people

In this section:

Trends and approaches in environmental regulation of mining

Environmental and social impact assessment

Environmental monitoring and auditing

Community consultation, engagement and protection

Managing mine closure

Over the past decades, the ‘polluter pays’ principle has become firmly embedded in the policy paradigm and environmental regulation has become more stringent around the world. While there are tensions between the objectives of attracting investment into mining and protecting the environment, evidence shows that it is possible to have *both* strong environmental regulation *and* a favourable investment environment in mining.

Traditionally, governments have used prescriptive approaches to environmental regulation (also called technology standards), which specify concrete technologies to be used for the mitigation of pollution. Non-traditional approaches to regulation, such as performance-based regulation which specifies targets for environmental performance and economic instruments, have become more widespread in recent years. Under certain conditions, these non-traditional forms of regulation – performance standards and economic instruments – can incentivize companies to devise or make use of more innovative solutions and cleaner technologies in a more cost-effective manner. These approaches can be conducive to improving the competitiveness of their mining industries while at the same time upholding strong environmental standards.

The main set of tools for mitigation and prevention of environmental and social impacts is the

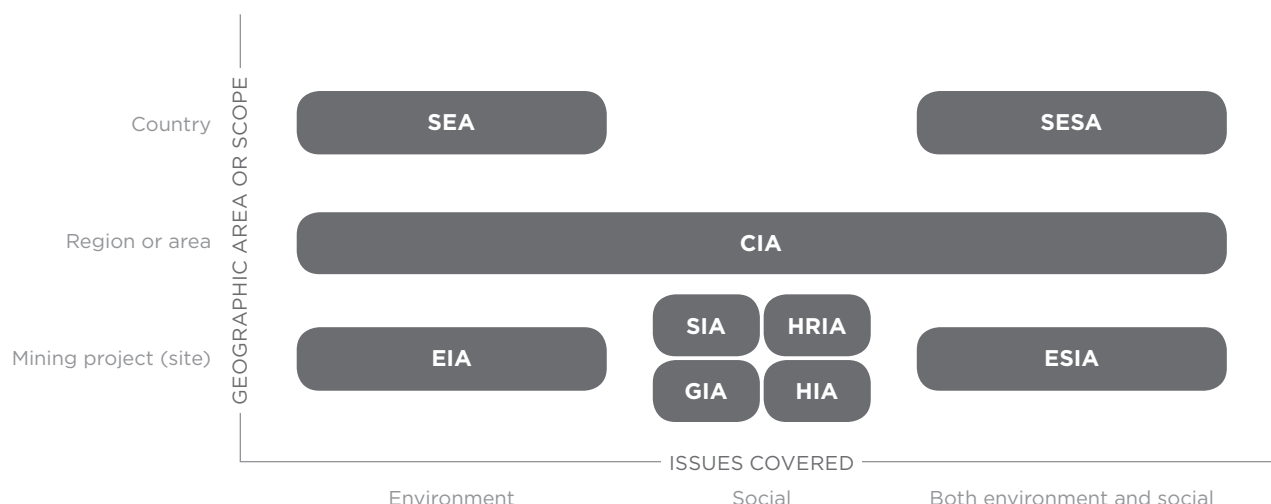
family of Environmental Impact Assessments (EIAs) (Figure ES3), which by now have become embedded in legal frameworks of most countries. Mining project proponents are required to conduct EIAs and prepare Environmental Management Plans (EMPs). Governments can also conduct cumulative and strategic impact assessments in regions and countries with extensive mining activity to formulate regional or national mining plans and policies.

In recent years, governments and mining companies have increasingly recognized the social impacts of mining and are enabling communities affected by mining to have a say in mining-related decisions and processes. More countries are adopting laws and regulations that require mining companies to consult with local communities to be affected by mining. The entry point for local community consultation is often done through the EIA process. In Asia, for example, India, Mongolia and the Philippines have adopted requirements for community consultation during the EIA process.

Community engagement is much broader than just the EIA process and should take place throughout the life of a mine. However, it is most effective during specific points – when mining company has not yet made significant investments and not secured the required permits.

The principle of consulting with people in making decisions that affect their lives is expressed in the principle of free, prior and informed consent (FPIC), which is applicable to the rights of indigenous peoples in international law. FPIC is also applicable to other ‘land-connected peoples’, such as traditional and local communities living in rural areas near mining sites. The acceptance of the right of indigenous peoples to free, prior and informed consent has grown significantly in the 2000s in the international business community – including the mining industry. Community consultation and engagement helps to balance economic development considerations with social and environmental considerations, leading to decisions that are more sustainable and viable politically and socially. Developing country governments have been slower in accepting community consultation and engagement principles; nevertheless, community consultation is now increasingly adopted as a rule in laws and regulations – particularly in environmental ones.

FIGURE ES3. THE FAMILY OF ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENTS



In 2011, the UN adopted its Guiding Principles on Business and Human Rights, which provided a framework for protecting and respecting human rights and remedying rights violations and infringements. Leading mining companies, through the industry body, the International Council on Mining and Metals (ICMM), were closely involved in the consultations which led to the development of the UN Guiding Principles on Business and Human Rights; the ICMM “fully supports” the Guiding Principles. The framework rests on three pillars – protect, respect and remedy (Figure ES4). Governments have fundamental duties to protect people in their jurisdictions from human rights abuses by businesses. Businesses have a duty to respect human rights – not only complying with the

applicable laws, but also respecting internationally recognized human rights. Governments also have the duty to provide remedies to people whose rights and lives are affected by mining by having strong judicial mechanisms, as well as instituting non-judicial grievance mechanisms, such as national human rights commissions and ombudspersons. The “Protest, Respect and Remedy” framework had become widely accepted and can be applied within the domestic legal framework.

A special set of challenges arises during mine closures. While the physical closure takes place at the final phase of mining, mine closure is an ongoing process, starting from the very beginning of a mining project. However, the majority of mines are closed

FIGURE ES4. THE UN “PROTECT, RESPECT AND REMEDY” FRAMEWORK FOR BUSINESS AND HUMAN RIGHTS



Source: Based on United Nations Human Rights Council 2008

inadequately or prematurely, without exhausting the mineral deposit. Moreover, weak environmental regulation results in mine abandonment, which can have extensive environmental legacies and large costs for governments. Countries with a long history of mining, such as Australia, Canada and South Africa, have started documenting the huge environmental impacts of abandoned and orphaned mines and taking action to clean them up, incurring large public costs.

To reduce the risk of mine abandonment, governments should have in place effective regulations. They also require environmental financial assurance (EFA) from mining companies, a deposit payment before commencing mining operations which would be used for mine reclamation and rehabilitation should the company default on its obligations.

Mine reclamation and rehabilitation are the key stages of mine closure. While governments and communities expect mine sites to be restored to their original state, these expectations usually cannot be achieved on a sustained basis or in a cost-effective manner. Alternative, and perhaps more realistic, objectives of mine closure can include establishing stable landforms with functioning ecosystems and at least some of the native biota, or bringing the site to a point where it can be used for alternative uses and establishing non-native biota and ecosystems. Such realistic expectations about land use after mine closure should be communicated to affected communities before a mining project starts.

The predominant concern in mine closure has traditionally been with environmental aspects of mining. Since mining often takes place in peripheral, less developed regions and locations, the socio-economic impact of mine closure can heavily impact local communities. Therefore, mining companies and governments need to see, plan and manage mine closure in a more holistic way, which not only addresses the environmental impacts, but also socio-economic issues, such as re-employment of mine workers and the development of alternative economic activities in the area.

Governments play a major role as regulators, enablers and facilitators for improving the environmental and social performance of mining. This sourcebook makes recommendations for governments towards this end.

RECOMMENDATIONS

Protecting the environment and people

Designing environmental regulation that adequately protects the environment, which also establishes clear rules for investors

Where capacities of the government and the mining industry allow, considering adoption of more innovative approaches to environmental regulation, such as performance-based regulation and economic incentives

Making requirements for EIA and EMP for the mining industry, setting out clear roles for the government, mining companies, environmental services experts, civil society organizations and community groups

Establishing laws and regulations for mine closure that prevent large environmental legacies and public costs

Ensuring that affected communities are informed in advance of mining projects about land use options which are available after mine closure

Investing in capacities of regulators for monitoring and enforcement of regulations

Improving intra-governmental coordination mechanisms, such as those between mining and environmental ministries, local governments, human rights commissions and other government agencies

Enhancing access to mining-related information that is important and relevant to local communities

Fostering a culture of transparency in the government and in the mining industry

Opening legal avenues for local communities and indigenous peoples affected by mining to have a say in mining projects; defining minimum standards for adequate consultation and consent; investing in the capacities of communities affected by mining; and providing access to remedy for people affected by mining.



Realizing and enhancing the benefits from mining

In this section:

Fiscal revenues

Employment and economic growth

Mining and local development

Integrating mining into strategies and plans

The mining sector can bring significant economic benefits to a country by generating fiscal revenues and export earnings, relieving constraints to investment, spurring economic growth and creating jobs, as well as contributing to physical infrastructure building. However, realizing and enhancing these benefits require action, primarily from the government, but also from mining companies, local communities, employers and businesses in the country.

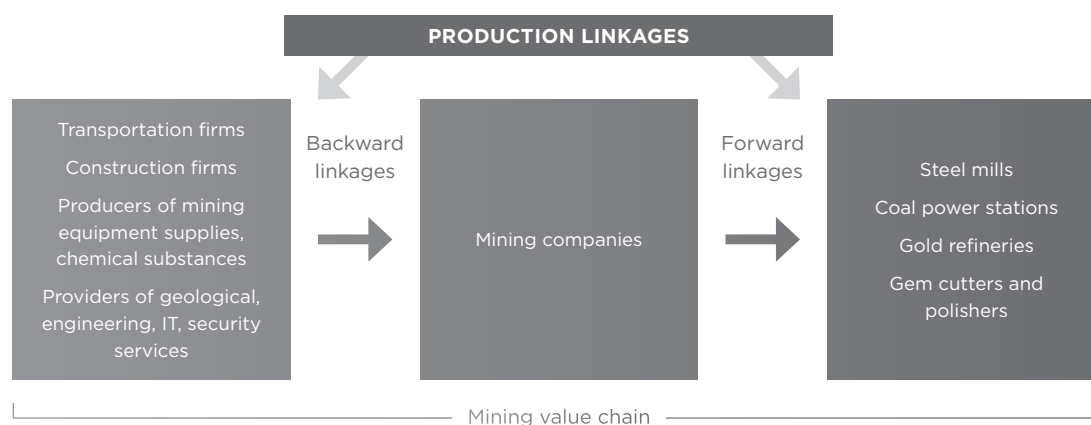
Fiscal revenues from the extractive industry – taxes, royalties and other payments – is one of the major reasons why governments seek to promote the growth of this industry in their countries. However, revenues from mining and benefits from these revenues do not flow in automatically. To translate fiscal revenues from the extractive industry into

sustainable development benefits, governments need to design and institute fiscal regimes that ensure a fair share of benefits to the country, which are also attractive for mining investors. Tools available to gauge whether the country is getting its ‘fair share’ and for managing the volatility of revenues from mining (or generally, the extractive industry) are reviewed in this sourcebook. Governments, along with companies, need to improve the transparency of fiscal revenues, which include disclosure of mining contracts and revenue flows. The Extractive Industries Transparency Initiative (EITI) is one of the key international initiatives for improving transparency.

Governments should also prudently manage fiscal revenues from mining and in a way that addresses the volatility of these revenues. They also need to invest these revenues in long-term development – social, infrastructure investments, financial savings and economic diversification.

Mining brings benefits by driving economic growth and creating jobs. In addition to direct jobs, mining creates indirect and induced jobs, which can be much greater in number compared with direct jobs in mining. Similar with manufacturing, mining is a sector with rapid technological progress, enabling people to learn and acquire skills. These skills can foster the productive capabilities of other companies in the country – which are arguably the single most important factor in driving economic development. Mining also drives economic growth through its linkages with the rest of the economy, such as by buying goods and services from supplier firms (backward linkages), and by supplying minerals to buyer firms (forward linkages) (Figure ES5).

FIGURE ES5. PRODUCTION LINKAGES IN THE MINING VALUE CHAIN



To increase employment and strengthen linkages from mining to the rest of the economy, governments should improve the competitiveness of local workers and the competitiveness of locally produced goods and services which can potentially supply the mining industry. Improving competitiveness is particularly important considering the rapid diffusion of automation technologies in the mining industry. Measures to improve competitiveness can be complemented by requirements for mining companies to increase local content – goods and services produced competitively in the host country or supplied by local workers and companies.

Local communities that live near mine sites can also gain economic benefits from mining. They have legitimate expectations that mining companies should not only mitigate the negative environmental and social impacts of their activities, but should also take actions to promote local development. Increasingly, mining companies accept these expectations and seek to address them as part of their Corporate Social Responsibility (CSR) initiatives. They do so by implementing or funding local development initiatives, usually focused on health, education, infrastructure and business development. In the past two decades, community development programmes have become widespread in the mining, oil and gas industry. In some cases, local development initiatives are formalized in community development agreements (CDAs).

Traditionally, governments have focused on economic, mainly fiscal, benefits from mining, while putting low priority on the environmental and social costs of mining. This is becoming increasingly untenable. Governments should make their strategies for managing mining consistent with their commitments to sustainable development.

Tools such as Strategic Environmental and Social Assessments (SESA) and Cost-Benefit Analyses (CBA) can assist in assessing the overall impacts of mining – not just financial. Despite pressures to consume and produce more minerals, mining is not inevitable – governments can decide to use the land and natural resources for other purposes – to preserve the environment or to promote economic activities that sustainably use renewable resources.

This sourcebook makes recommendations to governments to help realize and enhance the benefits of mining for development.

The lack of coherence between policies, laws, regulations and other actions of the government undermines the environment, the livelihoods and the rights of people, and the potential of a country to earn fiscal revenues from mining. Governments can use experiences and examples highlighted throughout this sourcebook to improve coherence of their policies, legal frameworks and actions to implement them to enhance the positive impact of mining on sustainable development and more effectively mitigate the negative impact.

The sourcebook also shows that governments are important, but are not the only actors that determine how mining impacts on economic, social and environmental dimensions of development. They need to collaborate with mining companies, local communities, international actors and other stakeholders in a way that promotes good environmental stewardship, efficient resource extraction, protection of human rights, and enhancement of economic benefits from mining.

RECOMMENDATIONS

Realizing and enhancing the benefits from mining

Designing and instituting progressive fiscal regimes that balance between the financial returns to the country (or the government) and those to the mining companies, in line with international comparisons

Making use of tools such as project-level mining fiscal models to estimate the government "take" from mining projects to design fiscal regimes and negotiate with mining companies

Ensuring that the fiscal regime is stable over time, which in the long term would help to move towards greater reliance on legal frameworks, rather than mining contracts

At the same time, ensuring flexibility of the fiscal regime to respond to the cyclical nature of the minerals and metals commodities markets, by building in contract negotiation clauses

Ensuring transparency of the fiscal regime (in the flows of resource revenues and in mining contracts) and access to information, by drawing on international transparency initiatives such as the EITI; ensuring a relatively straightforward fiscal regime that does not obscure transparency; and fostering an overall culture of transparency

Managing the volatility of resource revenues by using tools such as structural budget rules developed by the International Monetary Fund (IMF), and designing and instituting natural resource funds

Investing resource revenues in a way that increases (or does not deplete) the national wealth, into infrastructure, social service provision, financial assets and alternative sources of growth, setting priorities that are consistent with the country's level of development and needs

Using a combination of strategies to improve the competitiveness of domestic workers and firms and to set local content requirements to help enhance the benefits from the mining sector for employment, business development, and economic growth

Collaborating with and fostering collaboration between mining companies in order to design and implement local development initiatives, community development agreements and skills development initiatives

Supporting the capacity of local communities impacted by mining to take greater advantage of local development opportunities

Encouraging local development initiatives by mining companies to be synergized with government plans and programmes

Integrating the country's mining sector strategies with other plans and policies, such as national and regional development plans, fiscal revenue projections and budget plans, macroeconomic policies, land use plans, infrastructure plans, public service delivery plans, human resource development plans and education policies; and ensuring coherence between plans, policies, strategies and laws



Introduction

1

OBJECTIVES OF THE SOURCEBOOK

To provide national and local policymakers, as well as international development partners, with an introduction to sustainability considerations related to social, environmental and economic impacts of mining, as well as to policy instruments and practices for managing mining towards sustainable development






To suggest ways for national and local policymakers and development partners to better incorporate social and environmental sustainability into their work, strengthening sustainable management of mineral resources at the national and subnational levels, and enhancing the economic benefits of mining for achieving the SDGs.

This sourcebook synthesizes a rich body of knowledge that is already available on sustainability issues related to mining, and extracts the knowledge that is most relevant for policymakers, such as policy and regulatory tools and practices for managing the mining sector for sustainable development. It focuses on practical issues that need to be addressed by policymakers, administrators and regulators, as well as leaders and members of communities in areas impacted by mining, such as ensuring the coherence of the legal framework, environmental regulation and impact monitoring, safeguarding human rights and engaging local communities, as well as strategies to enhance the fiscal and economic benefits from mining.

While the sourcebook was written to respond to the needs of countries in the Asia-Pacific region, it is also relevant to other regions of the world.

The sourcebook focuses on the management of industrial-scale mining, rather than artisanal and small-scale mining. Many of the experiences and recommendations are also relevant for the management of other natural resource-based sectors, such as oil, gas and hydropower, as well as industrial-scale agriculture and logging (See Figure 1).

FIGURE 1. THE RELEVANCE OF THE SOURCEBOOK TO NATURAL RESOURCE SECTORS

	NATURAL RESOURCE SECTORS (OR RESOURCE SECTORS)				
	EXTRACTIVE INDUSTRIES		RENEWABLE RESOURCE SECTORS		
	ENERGY SECTOR				
	 Mining	 Oil (petroleum) and gas	 Hydropower	 Large-scale agriculture	 Logging
Impacts during the life of the natural resource project					
Exploration	●	●	○	○	○
Development	●	●	○	○	○
Operations	●	●	○	○	○
Closure	●	●	○	○	○
Orienting legal framework towards sustainable development					
Domestic legal framework	●	●	●	●	●
Contracts	●	●	●	●	●
Investment treaties	●	●	●	●	●
International human rights law	●	●	●	●	●
Environmental conventions and treaties	●	●	○	○	○
Voluntary standards	●	○	○	○	○
Customary rules	●	●	●	●	●
Protecting the environment and people					
Environmental regulation	●	●	●	●	●
Environmental and social impact assessment	●	●	●	●	●
Environmental monitoring and auditing	●	●	●	●	●
Community consultation, engagement and protection	●	●	●	●	●
Project closure	●	●	○	○	○
Realizing and enhancing the benefits of resource extraction					
Fiscal revenues	●	●	●	●	●
Employment and economic growth	●	●	●	●	●
Local development	●	●	●	●	●
Integrating resource development into strategies and plans	●	●	●	●	●





Mining and sustainable development

Mining has major impacts on **11 out of the 17** Sustainable Development Goals

78 percent of Asia and Oceania's mineral and energy production takes place in Australia, China, India, Indonesia and Iran

In the Asia-Pacific, Lao PDR, Mongolia and Papua New Guinea are the **most dependent on mineral exports**



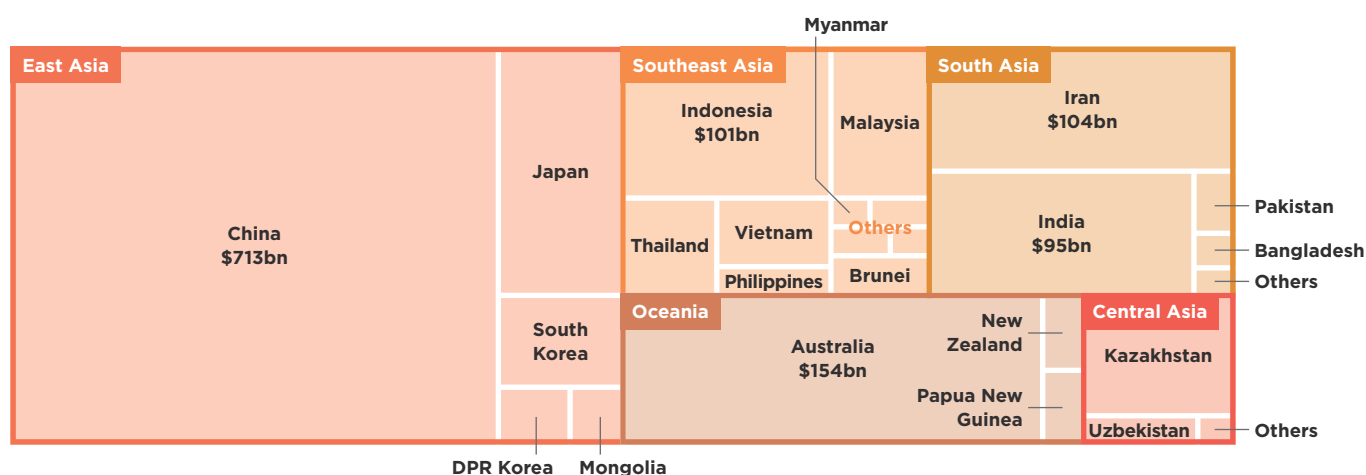
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In its landmark 1987 report, the World Commission on Environment and Development defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.³ Sustainable development is a guiding principle for long-term development which balances economic and social development and environmental sustainability. The universal importance of sustainable development has recently been more firmly recognized than ever, as signalled by the historic adoption of the 2030 Agenda for Sustainable Development and 17 global Sustainable Development Goals (SDGs) by 193 United Nations Member States in 2015.

Mining – the extraction of minerals⁴ from the earth – presents opportunities, challenges and risks to sustainable development. Minerals are essential for human well-being and fundamental for virtually all

sectors of the economy. Much of the Asia-Pacific region’s economic growth and poverty reduction is underpinned by a dramatic increase in utilization of mineral resources along with water and energy. Material use increased from 5 billion to 37 billion tons annually in 4 decades. At an annual growth rate of 5 percent, the Asia-Pacific region’s material use is now the largest of all world regions and is growing much faster than in the rest of the world.⁵ Mineral and energy production in Asia and Oceania has grown from 33 percent of the world’s production in 2000 to 48 percent in 2015.⁶ Australia, China, India, Indonesia and the Islamic Republic of Iran dominate the production of minerals in Asia and Oceania (See Figure 2).⁷ Mineral resources also represent a high proportion of exports in countries such as the Lao People’s Democratic Republic (38 percent, primarily copper and gold), Mongolia (68 percent, mainly copper) and Papua New Guinea (46 percent, mainly copper, gold and oil).⁸

FIGURE 2. MINERAL AND ENERGY PRODUCTION IN ASIA AND OCEANIA



Source: Authors’ calculations based on UN Statistical Division database. Average for 2010–2015, in current US dollars. The sizes of boxes are approximately proportional to the value of minerals and energy production, including upstream and downstream.

³ Brundtland et al. 1987.

⁴ A broad definition of minerals includes metals, industrial minerals, construction materials and energy minerals (United Nations Environment Programme (UNEP) 2000. Other definitions of minerals exclude metals and energy, setting them in stand-alone categories.

⁵ United Nations Environment Programme (UNEP) 2015.

⁶ Authors’ calculations based on the UN Statistical Division database (national accounts estimates of main aggregates, gross value added by kind of economic activity at current prices – US dollars). Average 2010–2015; includes minerals and utilities. The figure includes Western Asia. Accessed 8 February 2018.

⁷ Not including Western Asia.

⁸ Authors’ calculations based on the UNCTAD Statistics database (merchandise trade matrix – product groups). Average 2010–2016; includes hard minerals only. Accessed 8 February 2018.

However, mining presents critical sustainability challenges and risks, especially in terms of environmental sustainability and sustainable social development. Mineral resources are finite and non-renewable, at least in human or biological timescales. Environmental and social problems and risks, including environmental pollution, negative impacts on ecosystems and biodiversity, the displacement of people, and loss of natural resources which serve as sources of livelihoods for poor and vulnerable populations, are increasingly generating conflicts between mining companies and local communities. With declining ore grades for most minerals, resource intensity and the amount of waste generated (water, energy, chemicals, greenhouse gases (GHGs), waste and other pollutants) per unit of resource produced is likely to increase and associated environmental costs will prove a constant and growing challenge.

At the same time, the transition towards a low-carbon society implies a potential increase in demand for certain metals. For instance, the demand for metals required for electric storage batteries such as aluminum, cobalt, iron, lead, lithium, manganese and nickel is projected to rise significantly under the goal of a scenario of 2 degrees of global temperature increase. The momentum towards a low-carbon society as marked by the 2015 Paris Agreement on Climate Change highlights the urgent need for bringing together the extractive industry and the, clean energy, climate change and environmental communities together on a pathway to sustainable development.⁹

Mining can also contribute to sustainable development, particularly to its economic dimension. It can bring fiscal revenues to a country, drive economic growth, create jobs and contribute to infrastructure building. Mining is relevant for all Sustainable Development Goals,¹⁰ and has particularly strong impacts on (See Figure 3):

- Environmental sustainability goals – SDG 6 (clean water and sanitation), SDG 15 (life on land), and SDG 7 (affordable and clean energy) and SDG 13 (climate action)
- Social inclusion goals – SDG 1 (no poverty), SDG 5 (gender equality), SDG 10 (reduced

inequalities) and SDG 16 (peace, justice and strong institutions)

- Sustainable economic development goals – SDG 8 (decent work and economic growth), SDG 9 (industry, innovation and infrastructure) and SDG 12 (responsible consumption and production).

To make mining more sustainable and to better balance the demand for mineral resources with the need for minimizing and managing negative social and environmental impacts of mining, the concept of sustainable development in the mining sector needs to be more effectively operationalized. To do this, it is important to specify the sustainable development principles that are most relevant to mining. Throughout the life of a mine and the whole value chain of mining, coordinated efforts must be made to protect the environment, safeguard human rights and enhance benefits from mining. This requires upholding principles such as minimizing the depletion of non-renewable natural resources, the ‘polluter pays’ principle, the precautionary principle, resource efficiency, full costing and environmental impact assessments, the FPIC principle, public participation, transparency and accountability, and multi-stakeholder partnerships in the public interest.

The mining industry is increasingly becoming aware of its broader societal responsibilities, and some leading companies have progressed significantly in recent years, as manifested in numerous initiatives led by the peak industry body, the International Council on Mining and Metals (ICMM). Governments of over 60 countries have also come together and formed the Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (IGF) to improve governance and decision-making to leverage mining for sustainable development. These are only two among many initiatives undertaken by governments, mining companies, civil society, financial institutions, academia, research institutions and international organizations to address the challenges of mining for sustainable development.

It is important to more clearly identify and define the social, environmental and economic issues that are within the legal responsibilities and capacity of governments, as well as the mining industry, local

9 World Bank 2017.

10 CCSI, SDSN, UNDP and WEF 2016.

communities and other key stakeholders. Based on this common understanding of concrete sustainable development issues related to mining, an optimal mix of legal, regulatory, fiscal, environmental management and social development policy tools and approaches can be identified based on the best available knowledge. Adequate institutional and technical capacity of different stakeholders will have to be developed to effectively implement the identified policies, tools and approaches to manage mining more sustainably.

FIGURE 3. MINING AND THE SDGS



Source: Adapted from CCSI, SDSN, UNDP and WEF 2016.



Impacts of mining during the life of a mine

Metal mining generates **15 billion tonnes of waste per year** – 10 times the global municipal waste

453 violent conflicts between mining companies and communities were recorded worldwide in 2002–2013

From 1950 to 1990, mining is estimated to have **displaced 2.6 million people** in India



3

FIGURE 4. MAIN IMPACTS DURING THE LIFE OF A MINE

MINERAL EXPLORATION	MINE DEVELOPMENT	MINING OPERATIONS	MINE CLOSURE
<ul style="list-style-type: none"> Limited, but escalating impact as exploration progresses. 	<ul style="list-style-type: none"> Limited impact during studies, assessment, planning, but future impacts and mitigation opportunities are 'locked' at this stage. Major environmental and social impacts during mine construction. Surge in demand for jobs. Resettlement, displacement, in-migration. 	<ul style="list-style-type: none"> Major environmental and social impacts, depending on the nature and scale of the deposit and mining method. Demand for jobs, goods and services. Fiscal revenue flows. 	<ul style="list-style-type: none"> Winding down of operations lead to reduced impacts, but can leave lasting environmental legacies and social dislocation Loss of jobs and fiscal revenues

Source: Adapted by authors based on sources cited throughout this sourcebook

Mining has impacts on virtually every aspect of sustainable development and human rights, and industrial-scale mining projects often span several decades. Mining has particularly strong environmental and social impacts on communities and areas near mine sites. These impacts are best understood when viewed in the various phases in the life of a mine: mineral exploration, mine development, mining operations and mine closure (See Figure 4).

3.1 Mineral exploration phase

The mineral exploration phase starts from prospecting and may continue into advanced exploration. At earlier stages of exploration, the environmental and social impacts are limited, but as exploration advances, the impacts escalate. Often, exploration can take place concurrently with mining – for instance, a mining company which already has started mining would do exploration in nearby areas.

Environmental impacts during exploration include the transportation of heavy equipment, increased traffic to the site, erosion and scarring of land from drilling and transportation, removal of forest and

vegetation covers, disturbance of wildlife habitat and dust pollution.

The main social impacts associated with exploration relate to the possible displacement of people, exposure of workers and communities to hazardous materials and blasting, and impacts on cultural heritage. During the exploration phase, fears can be created about the loss of land and environmental impacts, and expectations formed about economic opportunities.

3.2 Mine development phase: mine design and construction

The mine development phase includes detailed feasibility studies, detailed environmental impact assessment, mine design and planning, and the construction of the mine and mine facilities.

At the mine development phase, the main decisions are made by mining companies and governments which have implications for the environment, the surrounding communities, and fiscal revenues from the mining project. This is also the time

where a critical opportunity exists for meaningful consultation with communities to be affected by mining and the modification of the mine design, technologies to be used, and other decisions in a way that minimizes negative environmental and social impacts.

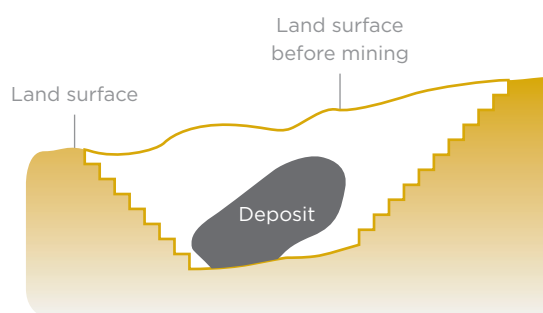
Major social and environmental impacts are felt when mine construction starts. Employment requirements at the mine site can surge, but often local communities have limited capacity to take

advantage of employment opportunities. Limited fiscal revenues may be received by the host government, but the flow of revenues does not really start until after the mine moves into the next phase – production.

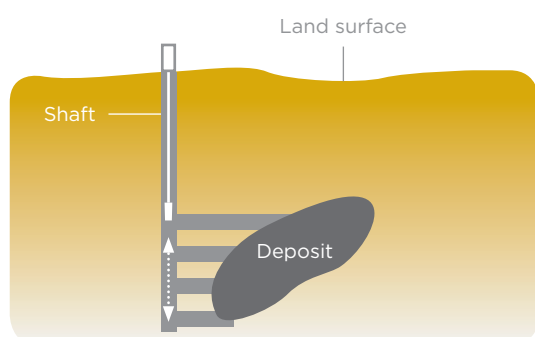
The magnitude and the type of impacts depend on the type and scale of the mineral deposits and on the geological and physical features of the deposit, which largely predetermine the mining method (See Box 1).

Box 1 Mining methods

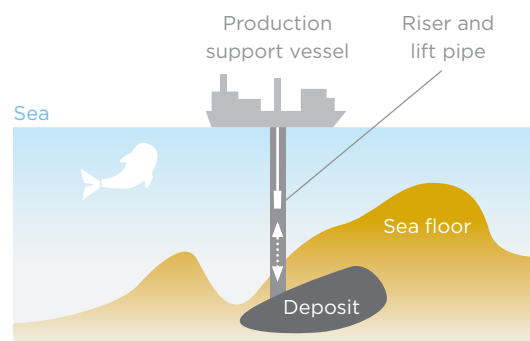
Surface (open pit) mining has the most visible and dramatic landscape changes where large areas of land are stripped of their vegetation cover, leading to the disturbance and loss of forests, animal habitat and displacement of people. These processes can disturb water sources and riverbeds, and deplete springs. In addition to hard-rock mining, surface mining includes placer (or alluvial) mining – mining of mineral and metal deposits that are found in gravel and sand, usually in riverbeds. Placer mining requires less advanced equipment and is often done by artisanal and small-scale miners.



Underground mining is done for minerals and metals that lie deep in the earth. It has less impact on the landscape, but still significant impacts on the groundwater. Over time, as mining progresses, improper refilling of underground mines can result in subsidence, or cave-in. Underground mining is costly and requires advanced engineering, equipment and skills.



Deep sea mining has emerged in recent years, as oceans and seas are estimated to hold large quantities of precious metals and minerals.¹¹ Mining of deep sea minerals will have different impacts depending on the types of deposits and local marine environments. It is difficult to estimate the scale of its impacts, given that the scientific knowledge of deep sea environments is currently limited.¹²



11 United Nations Environment Programme (UNEP) 2014.

12 Clark et al. 2013.

Displacement: The main social impacts during the mine development phase are associated with displacement, which includes both physical and economic displacement.¹⁴ Between 1950 and 1990, mining is estimated to have displaced 2.55 million people in India.¹⁵ Displacement is accompanied by the loss of physical assets, access to natural resources, social networks and cultural identity, leading to impoverishment that heavily affects indigenous peoples and marginalized communities. Human rights abuses associated with mining have

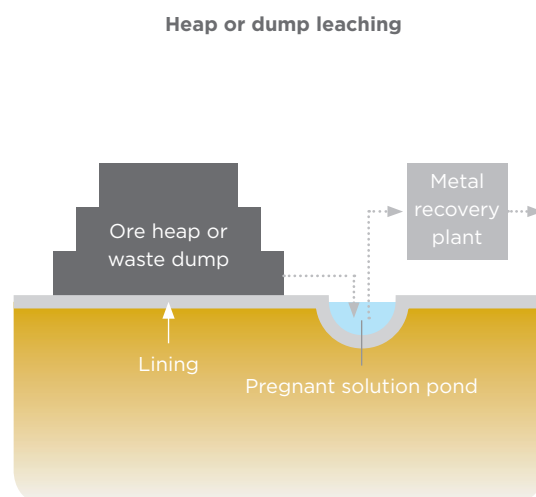
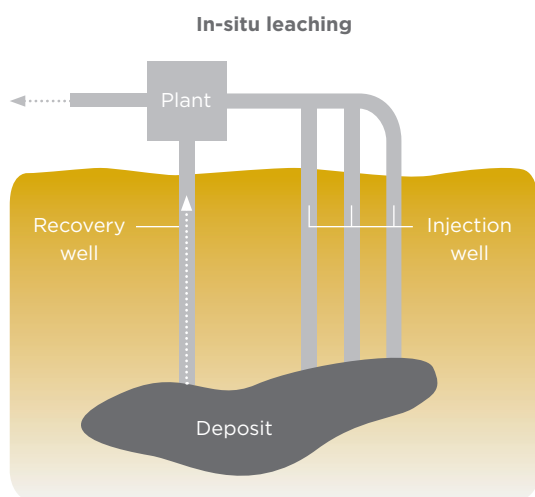
been widely documented (See Section 4.5 on Customary rules). The impacts of displacement can be mitigated through well-managed resettlement processes and follow-up.

Environmental impacts: Construction of mines and mining facilities has impacts on health and environment through water, air and soil pollution, and noise from blasting. New infrastructure constructed to serve mines adds further environmental impacts.

Leaching is a process of treatment of the ore or mining waste by chemical solutions, reagents and other compounds to extract the useful ore or ore concentrate. It is used for mining and mineral processing (beneficiation) of metals and some minerals.

- **In-situ leach mining** involves applying chemical solutions to the host deposit; in-situ leaching involves less earth moving, but chemical solutions seep into the ground and ground water.
- **Heap leaching** involves application of chemical solutions to the ore after extracting it and placing it on a lined surface, which largely prevents solutions from penetrating into the ground and ground water.

- **Dump leaching** (similar to heap leaching) is reprocessing of mine waste for residual metals; if planned and carried out well, it could improve efficiency in mining with reduced environmental impacts.¹³
- **Bio-leaching** involves using bacteria to extract the mineral, rather than using chemical substances. Bio-leaching methods have been developed in recent years and they can have more benign environmental impacts. However, bio-leaching is slower and most costly than conventional leaching, and needs to be managed properly to avoid environmental problems.



Sources: Adapted and simplified from Environment and Natural Resources Canada; World Information Service on Energy Uranium Project; Greenpeace.

¹³ Lèbre and Corder 2015.

¹⁴ International Finance Corporation (IFC) 2012.

¹⁵ Downing 2002.

Box 2 Displacement from the Thach Khe iron ore mine¹⁶

The Thach Khe Iron Ore Mine is an open pit iron ore mine in central Viet Nam. Its reserves have been estimated at 544 million tonnes, or 60 percent of Vietnam's total iron ore reserves.

Mining activities were expected to impact around 4,000 hectares of land in six communes with about 4,000 households (16,800 people). These households were required to relocate.

Under the resettlement plan, all households should have been resettled between 2009 and 2013, with 60 percent of the total relocated between 2010 and 2011. However, the mining company failed to contribute the promised capital. In 2009, the company had committed to contribute AU\$65 million by 2010 but by 2012 had provided AU\$11.05 million.

As a result, resettlements were significantly delayed and some not completed. The delay in the resettlement process has seriously affected the lives of displaced people. In particular, the mining company progressed excavation operations before relocation had been finalized. Local people that had not been resettled on time were exposed to water shortage and contamination, air pollution, dust and noise.

However, mining projects also have significant socio-economic benefits for the host country. Benefits such as building new infrastructure and providing jobs start to be realized during the mine development phase.

Shared infrastructure: If infrastructure is planned and built to be shared between the mine and nearby villages and towns, they can spur economic activities and bring markets closer to local communities. For these benefits to be realized, planning and negotiation for the shared use of infrastructure and financial commitments should be done during the mine design phase – before mine construction starts.

Employment: During the mine construction, there is usually a surge in demand for workers. In mining that takes place in rural, remote areas without a large enough skilled workforce, many jobs might be required filled by new migrants to the area or 'fly-in' workers. After the mine construction is completed, the demand for workers declines and stabilizes at a lower level. The skills required at the mine operation phase differ from the skills needed during construction.

Conflicts: In mining, local communities living near mine sites experience negative impacts before benefits start flowing in. In many cases, they also receive disproportionately small benefits relative to the large negative impacts throughout the life of a mine. This can give rise to conflicts between mining companies and local communities. These conflicts can occur at any phase of mining, but are perhaps most prevalent during the mine construction phase. Globally, the number of recorded conflicts between mining companies and communities increased almost exponentially from 10 conflicts in 2002 to 90 by 2013.¹⁷ A more detailed review of conflicts, based on data from news sources and proprietary databases showed that all together, there were 453 mining-related conflicts in this period.¹⁸ Environmental, economic and health and safety issues were found to be the most common causes or triggers of conflict.¹⁹ Conflicts that delay or stop mining operations can incur substantial costs for mining companies: available figures suggest that delays cost mining companies US\$10,000 to \$50,000 per day during exploration; and in the order of US\$750,000 per day during mining (excluding indirect costs).²⁰ Other mining-related

16 Vo and Brereton 2014.

17 International Council on Mining and Metals (ICMM) 2015.

18 Andrews et al. 2018.

19 Ibid.

20 (Davis and Franks 2014)



conflicts can include conflicts within and between communities, and between locals and migrants. There are many cases when governments and artisanal miners also get involved in conflicts.

3.3 Mining operations phase: mining and mineral processing

The mining operation phase involves extracting the minerals; removing and storing earth, rocks and waste; and processing and transporting minerals. The impacts of mining operations can differ greatly depending on the type of mineral being mined, the geological features of the deposit and mining technologies used.

Major environmental impacts of mining include production of waste, release of toxic and hazardous waste, air pollution and emissions, water pollution

and depletion, and the loss of productive land and ecosystems. Moreover, mining can magnify or multiply existing environmental risks and hazards. For instance, degradation of soil resources can exacerbate food insecurity in arid and semi-arid regions. Tailings discharges from industrial and artisanal mining can lead to bioaccumulation of toxins in the food chain – accumulation of mercury in fish is a prime example. Particularly in water-scarce regions, degradation and/or diversion of freshwater resources can aggravate water scarcity and multiply the impacts of climate change by further reducing the availability of water for household consumption. However, many of these impacts can be significantly reduced with good management of environmental impact, including the use of appropriate technologies. Nevertheless, the growing demand for minerals and metals is leading to increased incidences of exploration and mining in environmentally sensitive areas – watersheds and glaciers, as well as areas prone to earthquakes and tropical storms.

Box 3 The Samarco Mineração Mine accident in Brazil²¹

A recent large-scale disaster with tailings happened in Brazil in November 2015. A tailing dam of the open-cast Samarco Mineração Mine in the state of Minas Gerais burst open, pouring out around 50 million cubic metres of mudflow thick with toxic mining waste, equivalent to about 25,000 Olympic-size swimming pools. The slurry was a mix of contaminated water and sediment with heavy metal content generated by the iron ore operations. The slurry flooded communities close to the dam and rendered communities in the districts of Bento Rodrigues and Paracatu completely uninhabitable. The “sea of mud” then oozed into one of Brazil’s largest rivers, the Rio Doce and has extinguished vast amounts of plant and animal life along a 650-kilometre stretch of the river, with the heightened turbidity drastically reducing the levels of oxygen in the water. It also made the water undrinkable, which severely affected the hundreds of thousands of people that were depending on it. Concern over toxins in the mining residue has led Brazil’s national water agency, ANA, to ban the use of the river water for human consumption. Hundreds of thousands of residents in the area have had to rely on supplies of bottled water.

According to projections from Brazil’s environment ministry, the toxic tide reached the Atlantic Ocean through the river estuary and has spread along 9 kilometres of coastline. It threatens the Comboios nature reserve, which is one of the only regular nesting sites for the endangered leatherback turtle.

Brazil’s environmental agency, IBAMA, described the collapse of the tailing dam of the iron ore operation as the country’s “*worst environmental catastrophe in [Brazil’s] history*”. Brazil’s Environment Minister stated that it could take up to 30 years to clean up the Doce basin.

21 The Guardian 2015a, 2015b and 2015c.

Waste production: Mining involves the production of large quantities of waste – waste rock, tailings, slag and leached ore. It is estimated that metal mining generates about 15 billion tonnes of waste per year, which is 10 times larger than global municipal waste.²² The amount of waste produced by mining activity depends on the type of mineral extracted and the ore grade. Coal mining generates the most amount of waste, followed by metals mining and industrial minerals mining.²³

Release of toxic and hazardous waste: The way mining waste is stored and treated can greatly affect the environment. Tailings dam failures have created some of the worst environmental accidents.

The toxic substance can seep into the ground and contaminate ground water. Breaking of tailings dams can release large quantities of toxic liquid that can kill aquatic life and poison water over large areas downhill from the tailings pond. Areas prone to storms, downpours and floods are more vulnerable to risks of tailings dam failures.

Emissions and air pollution: Dust and particles from mining operations can be disseminated widely by wind, causing air pollution. This phenomenon causes respiratory diseases among miners and people living in proximity to the mines. Mining operations also generate harmful gas emissions such as heavy metals fumes, carbon monoxide, sulfur dioxide and

Box 4 Acid mine drainage

Metals such as gold, copper, silver and molybdenum are often found in rock deposits that also contain sulphide minerals. When the sulphide minerals are exposed to water and air during the mining process, they form sulphuric acid, which is then dissolved in rainwater. The resulting acidic water leaches other metals in the rock, dissolving other harmful metals in the rock and forming a solution that is acidic, high in sulphate and rich in heavy metal. This solution flows from the mine and contaminates surface and ground water.

Acid mine drainage (AMD) may be released from any part of the mine where sulphides are exposed to air and water, including waste rock piles, tailings, open pits, underground tunnels and leach pads. Acid mine drainage presents a long-term risk for neighbouring ecosystems and communities. The impact of acid drainage on local wildlife and human life is through two vectors:

- Water contaminated by the acid drainage of a mine operation is often very acidic, with a PH value of four or lower. This level of acidity is similar to that of battery acid. Most plants, animals and fish cannot survive in such an acidic environment.
- Heavy metals (such as iron, copper, aluminium, cadmium, arsenic, lead and mercury), dissolved in acidic effluents through acid drainage, are toxic to humans and animal consumption. These metals do not break down in the environment. They persist in the bodies of water for long periods, providing a long-term source of contamination. Carried in water streams, heavy metal pollution can travel far, contaminating streams and groundwater over great distances.

AMD can be a perpetual problem, lasting for thousands of years. Prevention of AMD in the first place – so-called ‘source control’ – is a preferred solution compared with rehabilitation of AMD, because it is more cost-effective and reduces risks to the environment and people. However, source control measures may not always be feasible or pragmatic. Given the practical difficulties in inhibiting the formation of AMD at source, often the only alternative is to minimize the impact that the polluted water has on receiving streams and rivers and the wider environment; such an approach involves migration control measures. It is also possible to use some available technologies to extract and retain valuable metals from the AMD and use these to offset the costs of treatment.

²² Lèbre and Corder 2015.

²³ Ibid.



nitrogen oxides, generated by the combustion of fuel from plants and vehicles, from explosions and from the processing of minerals with chemicals.

Sedimentation and pollution of water: Mining affects and can even destroy bodies of water, such as rivers, estuaries, mangroves and wetlands. Some of the worst practices include disposal of tailings directly into rivers and shallow seas – practices that have catastrophic environmental consequences and are largely discontinued. Today, riverine tailings disposal is practised only in four mines in Indonesia and Papua New Guinea.²⁴

Water scarcity: Certain mining activities consume a lot of water, which can lead to the reduction of water resources particularly in arid and semi-arid environments. This can trigger water-use conflicts between mining companies and local communities.

Loss of productive land, ecosystems and biodiversity: Mining has a significant physical footprint on the land – it is estimated that mine waste covers about 100 million hectares of land globally; this land is not usable in the long term.²⁵ Land is also lost through waste storage, as well as the creation of large open-pit mines. Mining affects the livelihoods of people who rely on resources of forests, pastures and cropland, and disrupts ecosystems.

Safety: The mining industry is one of the most dangerous industries; therefore, safety standards are high on the priority of both mining companies and regulators. Mining operations carry high risk of injury, occupational illness or the death of workers due to reasons such as mishandling of machinery, explosions, gaseous asphyxiation and structural instability of underground mines; transportation also raises the risk of road fatalities. In 2014 and 2015, mining accounted for almost 7 percent of all worker deaths at workplaces in Australia.²⁶ The number and relative incidence of injury and death tends to be higher in developing countries, where safety standards and skills tend to be lower.

Gender inequality: Mining operations can widen gender inequalities. Women bear a disproportionate

share of the social costs and receive an inadequate share of the benefits of mining. This asymmetry in gender impacts is due to various reasons.

For instance, women's employment in mining is notoriously low, and they are more often employed in auxiliary jobs rather than core jobs. Due to their lower status in many traditional societies, women may not be consulted and compensations are often paid to men on behalf of their households. The negative environmental impact of mining can affect women's roles to provide food for their families.

Mining also has positive economic impacts, most of which are realized during the mine production phase.

Fiscal revenues: The most visible positive impact of mining is by generating taxes, royalties and other revenues for the governments of host countries. Governments can already start collecting revenues from mining at the mine development phase (such as signature bonuses paid upon signing of a mining contract). However, the bulk of revenues – such as royalties and corporate income taxes – come in when mine production starts.

Employment and business development: Mining creates jobs directly and indirectly; in underdeveloped regions, it may provide the only job opportunities outside of subsistence agriculture. By buying goods and services from suppliers in the country, mining can provide stimulants to the local and national economy. During the mine operations phase, mining employs fewer people than during mine construction, but provides more stable, long-term jobs. The frequent challenge for local communities, which may lack required skills, is to take advantage of employment and business opportunities.

24 International Maritime Organization (IMO) and United Nations Environment Programme (UNEP) 2013.

25 Lèbre and Corder 2015.

26 Safework Australia 2016.

3.4 Mine closure phase

Overall, mining leads to the loss of productive land, although with good planning and management of mining and its closure, mined land can be used for other purposes. Mining can also leave a legacy of long-term environmental impacts. After mine closure, jobs are lost, not only in the mine, but also in companies supplying to the mine.

At the mine closure phase, companies are required to wind down mineral extraction and processing, decommission mining processing facilities, conduct land reclamation and rehabilitation, close and seal waste facilities, and remove mine workers' camp and equipment. Many jurisdictions now require companies to make financial provisions for mine closure and rehabilitation. As part of their corporate responsibility, companies also take measures to retrain and relocate workers.

However, most mines close not because of depletion of the mineral deposit, but due to various economic, financial and political reasons, as well as social conflicts. An analysis of 1,000 mine closures showed that only 25 percent of mines close after exhausting the ore.²⁷ Premature mine closure means that the environmental impacts can be greater, due to inefficient mining processes and difficulties in environmental impact management of mines which become abandoned or change ownership. Therefore, more long-term planning for mining is required, starting early in the life of the mine.

²⁷ Lèbre and Corder 2015.







Orienting legal frameworks towards sustainable development

One in eight investor-state arbitration cases globally are associated with mining investments

Eight countries in Asia have started developing **National Action Plans on Business and Human Rights**: India, Indonesia, Japan, Malaysia, Myanmar, the Philippines, the Republic of Korea and Thailand

In Indonesia, it was estimated in 2008 that **71 million hectares of forest lands** were under timber and oil concessions, but only **0.23 million hectares** were designated for communities and indigenous groups.

4



The legal and normative framework of mining is anchored on domestic legal frameworks, but also encompasses mining contracts, hard and soft international laws, voluntary standards by the mining industry and customary rules. These elements of the legal, regulatory and normative framework are often inconsistent with each other and have critical gaps, particularly in areas that are essential for the protection of human rights and livelihoods of people affected by mining. Addressing these gaps and inconsistencies is necessary for improving the environmental and social outcomes of mining activities and for safeguarding the human rights of those affected by mining. Government agencies should coordinate between themselves at the national and subnational levels to ensure that the legal, regulatory and normative framework is implemented in a coherent manner, and in a way that is consistent with the sustainable development objectives of the country.

4.1 The domestic legal framework

The legal basis for mineral exploration, development and production is usually established in constitutions and mining laws. Constitutions of some countries explicitly establish who owns and manages mineral resources – often, mineral resources belong to “the people”, while the government manages these resources on behalf of the people. Constitutions include many provisions relevant to natural resources, such as land, health and labour rights, property ownership and access to justice, and civil and criminal legal procedures. However, constitutions do not contain details on the governance of the sector – these details are specified in laws and regulations.

Domestic laws and regulations define the responsibilities of mining operators related to all aspects of mining – operations, taxation, health and safety, environmental safeguards and resettlement. They also define responsibilities of the government with respect to providing permits in relation to mining the environment and associated land access.

Mining laws occupy the central place in the mining legal and regulatory framework. They set out procedures and conditions for exploration

or mineral extraction permits. These terms and conditions typically include: operational requirements, transition from exploration to extraction, data and information sharing on geology and mineral reserves, feasibility studies, and production requirements.

In addition to mining laws, other laws and regulations which influence mining include: tax laws; environmental laws and regulations, including environmental impact assessment and mine closure laws and regulations; laws and regulations on labour, health, safety, resettlement; land laws; corporation laws and investment laws; laws specifying roles and responsibilities of national and subnational governments, and laws on fiscal relations between them; and laws and regulations on public-private provision of infrastructure. Domestic laws and regulations need to be coherent with each other and with international laws, norms and customary rules practised in the country.

In a country where the mining legal framework is implemented adequately, the division of responsibilities between various government agencies, and that between national and subnational levels of government are clearly defined, and their actions are coordinated. Where the government is directly involved in mining through state-owned mining companies, the legal framework distinguishes the roles and responsibilities of the government as a regulator from those in its commercial role, as a mining operator.

4.2 Mining contracts

Mining contracts denote agreements made between the government and the investor for the purpose of mining. Mining contracts are usually entered with large investors and constitute another key element of the legal and regulatory framework in mining in many resource-rich countries.²⁸ Depending on the importance of mining contracts within the domestic legal and regulatory framework, mining legal regimes can be classified as a:

- **Law-based regime** – a regime that is mainly based on laws and regulations. Such a legal regime is uniformly applied across mining companies within the country; or
- **Contract-based regime** – a regime that is mainly based on contracts between mining companies and the government. In this regime, most obligations of mining companies, such as taxes, environmental requirements and social contributions are defined by contracts.

Mining contracts are signed by the executive government and, in some countries, they are further ratified by the legislature (parliament). Depending on the applicable legal system, in some countries mining contracts ratified by the legislature might acquire the force of the law and override mining laws and regulations. Even where they are not ratified by the legislature, they serve a regulatory function, since they specify rules for actions of the mining company and the government in respect to a given mining project.

In countries with long experience with modern mining (more ‘mature’ mining destinations), the mining legal and regulatory frameworks are well-developed and predictable; therefore, they tend to have law-based regimes, as there is less need

for case-by-case mining contracts. However, countries with less experience with mining might have less specific mining laws and regulations. In these countries, mining contracts might be used to make up for weaknesses or the lack of detail in the underlying laws and regulations, and thus their legal regimes become contract-based regimes.²⁹

From the public interest perspective, a law-based regime is preferable to a contract-based regime.³⁰ First, contract-based regimes are more secretive – mining and other resource contracts are often not disclosed.³¹ Many countries’ constitutions recognize that mineral resources belong to the people of the country, giving the public the right to know about their mineral resources. Therefore, a law-based regime, by being more transparent, is more conducive to informing the public about the resource sector. Transparency in mining or oil and gas deals is important also from mining investors’ perspective, as investors have greater assurance that they are treated equally. Nowadays, contract disclosure is increasingly recognized as a part of international best practice. Recent developments have shown that contract disclosure is feasible for a wide range of countries. Jurisdictions such as Burkina Faso, Colombia, the Democratic Republic of the Congo, Guinea, Liberia, Mexico, Niger, Peru, the Philippines, Tanzania and Western Australia now require resource contracts to be disclosed to the public.³²

Second, if the legal framework applies equally to all investors, monitoring of mining projects is more streamlined and the government has fewer burdens to monitor them. In contrast, contract-based regimes can result in a proliferation of contracts with varying requirements and differing tax and royalty rates, making monitoring of contracts complicated.

28 Mining companies may make many different agreements such as financing agreements, community development agreements (See Box 22. Community Development Agreements (CDAs)), infrastructure agreements and sales agreements. To distinguish mining contracts between mining investors and governments from other agreements, the term ‘investor-state agreements’ is used to denote mining contracts. In this document, ‘mining contract’ and ‘investor-state agreement’ are used interchangeably.

29 In addition to this typology of countries, there are also countries that use contracts as another method of granting rights or setting further terms and conditions rather than to fill legal and regulatory gaps. In referring to countries with contract-based regimes, this document does not refer to this group of countries. The author thanks Ana E. Bastida for this point.

30 This consideration applies whenever contracts are used to fill regulatory gaps.

31 The primary reason for non-disclosure of resource contracts to the public seems to be a vestige of long-standing industry practice. Mining contracts emerged from purely commercial contracts, which typically had a confidentiality clause indicating that there would be consequences if either party shared the terms with anyone else. This practice of secrecy has persevered in most oil- and mineral-rich countries, even with public contracts that govern billions of dollars of public revenues and directly impact the lives of many citizens.

32 Natural Resource Governance Institute (NRGI) 2017.



Third, stabilization clauses in natural resource contracts can limit the space for policymakers and law makers of the host country, thereby affecting countries that adopt more progressive laws and regulations to limit negative environmental and social impacts of mining and enhance the fiscal and economic benefits from mining. Stabilization clauses makes the contract or specific provisions in the contract immune to changes in national laws, effectively limiting the government's ability to change the rules governing the mining project without the company's consent. Consensus has been reached that stabilization clauses in mining contracts, if used, should be limited to fiscal (tax) provisions. Wider stabilization clauses – which 'freeze' the legal and regulatory framework – are now considered unusual and outdated; however, they are still in effect in the mining sector in several less developed countries.³³

From the perspective of mining investors, the possibility of freezing key provisions in the contract is attractive, because it helps prevent unanticipated changes in the legal framework that may jeopardize their investment and raise their costs. Large-scale mining operations require large upfront investments, and returns on these investments are recouped over several decades. Therefore, changes to the 'rules of the game' after the investments are made can make

the overall investment less profitable than expected or even not worthwhile. Thus, governments seeking to attract large foreign investment may agree to stabilization clauses in mining contracts; this was prevalent in many developing countries in the 1980s and 1990s when mineral prices were low.

Rather than using mining contracts to fill legal and regulatory gaps, it is preferable to improve the legal framework for mining and ensure its reasonable stability. Nevertheless, there may be good reasons for governments to make contracts with mining companies for purposes other than filling legal and regulatory gaps. Mining contracts allow dealing with project-specific issues such as building infrastructure, mitigating environmental impacts, and specifying the government's direct participation (shares) in a mining project. For example, in Australia, investor-state agreements have been used to establish large, export-oriented mining projects since the 1950s and are still in use today. In Western Australia, in addition to the Commonwealth (federal) and state laws and regulations, *State Agreements* between the state government and mining companies are used to facilitate the development of infrastructure (e.g. railways, ports and corridors) for mining projects in greenfield locations (undeveloped land).³⁴

Box 5 Contract of Work in Indonesia

In Indonesia, mining activity was governed by the Contract of Work (CoW) system for over 40 years. Each CoW was an independent piece of legislation approved by the Indonesian Parliament and signed by the President. No CoW has ever been revoked except as provided for under default provisions within the agreements themselves.

The 1967 *Foreign Capital Investment Law* allowed foreign investment in mining and in 1967 Freeport Sulphur signed the first CoW with the Indonesian Government to mine copper in the West Irian province. Mining CoWs designated foreign firms as contractors working for the Indonesian Government and paying corporate income tax on profits in addition to royalties and other taxes. A series of CoWs followed the Freeport Sulphur contract, on slightly less generous terms. Overall, the Indonesian Government has issued a total 268 CoWs, of which only 12 have achieved production status.³⁵

In 2009, the Indonesian Government passed a new law to replace the CoW system by a general mining licence system. The 2009 *Mining Law* led to the renegotiation of several CoWs, though most mines currently in operations are still governed by these contracts.

33 As of 2008. International Finance Corporation (IFC) and UN Special Representative on Business and Human Rights 2008.

34 Fitzgerald 2001.

35 Ballard 2001.

Many developing countries have legal frameworks reliant on contracts, such as the Lao People's Democratic Republic (*mineral exploration and production agreements*) and Papua New Guinea (*franchise agreements*). But countries are increasingly moving away from reliance on contracts that fill legal and regulatory gaps. For example, Indonesia reformed its mining legal framework with the adoption of the Mining Law in 2009, and is currently in the process of renegotiating existing mining agreements (See Box 5).

Although each mining contract is negotiated on a case-by-case basis and establishes a unique framework for the development of an individual mining project, there is usually a degree of similarity between agreements. Adopting model mining contracts and limiting the number of contract terms open to negotiation enables countries to improve the consistency, uniformity and effectiveness of their contractual regimes. The International Bar Association has developed a Model Mining Development Agreement (MMDA) with the support of the World Bank in 2012.³⁶ It was developed by analysing many existing investor-state agreements in mining, and through an extensive process of consultation and feedback from public and private interest groups and leading experts in the field. The Model Mining Development Agreement provides a set of 'lead clauses', as well as a series of alternative clauses taken from existing agreements. However, it should be noted that the MMDA should not necessarily serve as an aspirational model, because it relies on existing agreements which are not necessarily conducive for sustainable development. Model agreements should provide sufficient policy space for environmental and social laws and regulations of the host country.

If mining contracts are made, governments should pay special attention to provisions related to environmental impact mitigation, mine closure, resettlement, local content and employment. Separate community development agreements can also be helpful in this regard (See Box 23).

4.3 International treaties, conventions and soft law

While few specific references to mineral exploration and exploitation appear in international law, the international legal framework has a bearing on the governance of mining. It is a general principle in international law that sovereign states have the rights and responsibilities to legislate and regulate activities within their borders, including exploitation of their natural resources. Nevertheless, international law – treaties, conventions and declarations – have implications on extractive activities. Therefore, governments should seek to ensure consistency between their domestic legal framework and its enforcement, as well as the international law.

Three categories of international law have the most relevance for mining: international investment treaties, international human rights law, and environmental conventions and treaties.

4.3.1 Investment treaties

Although investor-state agreements are situated within the domestic legal framework, a contract with a foreign investor is considered an international contract and is governed by international investment treaties if the host and home countries' governments are parties to such treaties. Home country governments enter into these treaties to protect their companies' investments abroad, while host country governments do so to promote foreign investment in their countries. Investment treaties allow investors to bring claims against host countries through investor-state arbitration.

Investment treaties provide strong protections for international investors through a number of provisions. The host state guarantees to treat the foreign investor in a non-discriminatory way (for example, through 'national treatment' provisions that require treating foreign investors no worse than domestic investors, and 'most favoured nation treatment' provisions that require treating an investor from a given country not worse than investors from any other countries), and to protect against

36 Model Mining Development Agreement (MMDA) project and International Bar Association 2011.



direct or indirect expropriation, limit performance requirements, and provide guarantees on free transfer of capital. Moreover, the enforcement of international treaties is very effective.

There are several issues to watch for in investment treaties with respect to mining and its environmental and social impacts. For example, if the host country government adopts a law banning the use of certain substances (e.g. mercury) prohibiting mining in ecologically sensitive areas, or strengthens its environmental regulations to require better compliance, a mining company can claim that these government actions reduce the value of its mining investment and constitute indirect expropriation or unintended discrimination; they can litigate against the host country government on these grounds.

Some investment treaties also restrict performance requirements, such as requirements to buy local goods and services, use certain technologies or train workers. These restrictions can limit the positive impact of mining investment on the local economy.

Between 1987 and 2015, investors globally initiated approximately 650 international arbitrations against governments,³⁷ with most of these arbitrations initiated in the last 10 years. About one in eight of these arbitration cases are associated with mining investments.³⁸ The cost of such arbitrations and

lost claims can be particularly harsh for countries with high poverty and development needs. For example, Kyrgyzstan currently faces arbitration claims of US\$925 million, including major claims by mining companies. Compare this to the combined health and education budget of the country in 2015 of US\$616 million.³⁹ The government of Ecuador lost an investment dispute case against Occidental Petroleum; the initial award to the company was US\$1.7 billion, approximately equal to the country's annual health budget. In 2016, Ecuador withdrew from bilateral investment treaties with 16 countries – a decision based on evidence that these treaties failed to deliver investment, costed the country billions of dollars, and threaten the government's capacity to protect its citizens.⁴⁰

Although many of the problems that give rise to investment disputes have to do with corruption and mismanagement on the part of host country governments, there are also many cases of unreasonable claims of investors against host country governments. Overall, strong protections afforded to investors and the effective enforcement of international investment treaties can be detrimental to environmental protection, human rights and social development. Beyond litigation costs and possible compensation costs in the case the state loses the claim, arbitration and litigation

Box 6 Investment treaty negotiation support in Myanmar⁴¹

Since the beginning of democratic reforms in 2010 in Myanmar, numerous policies and laws have begun to be reviewed and amended, while old laws have been rescinded. At the same time, Myanmar was approached by countries seeking to make investment agreements. As of 2016, Myanmar has signed 5 bilateral investment agreements and is said to have 12 investment agreement negotiations pending. However, Myanmar's experience in dealing with such international investment agreements is limited, further complicated by the evolving legal and regulatory framework.

The UNDP-UNEP Poverty Environment Initiative (PEI) has supported the Directorate of Investment and Company Administration (DICA) of Myanmar in understanding the implications of investment agreements and their interactions with national law. It also developed an investment treaty negotiation support document and conducted training in using it.

37 Based on publicly available information collected by UNCTAD. It should also be noted that many arbitrations are conducted behind closed doors.

38 United Nations Conference on Trade and Development (UNCTAD) 2017.

39 Knottnerus and Ryskeldi 2017.

40 Ibid.

41 This text was contributed by Samara Yawngghwe, PEI Myanmar.

cases with investors can deter other foreign investors from investing in the country.

Partly prompted by a billion-dollar lawsuit made by a UK-based mining company against the Indonesian government, the government of Indonesia embarked on a process to rebalance its engagement with investors by discontinuing treaties or reassessing provisions of existing investment treaties and investment chapters in trade agreements. As part of this effort, Indonesia is also developing a new treaty model of international investment agreements.⁴² To ensure that mining contributes to sustainable development and to prevent costly arbitration processes, resource-rich countries should consider adequate protection for the environment and human rights in negotiating new investment treaties or renegotiating existing ones.

4.3.2 International human rights law

The core instruments of human rights law are the International Covenant on Civil and Political Rights and the International Covenant on Economic, Social and Cultural Rights. In addition, the ILO Convention No. 169 on the Rights of Indigenous Peoples is binding on the states that ratified the convention.

In addition to hard law (covenants, conventions and treaties binding on states that ratified them, such as the Human Rights Covenants and the ILO Convention 169), there is also a body of soft law – non-binding instruments such as declarations and guidelines. The United Nations Declaration on the Rights of Indigenous Peoples, which was adopted in 2007, is non-binding, but it refers to the rights specified in the Human Rights Covenants and thereby becomes customary law.

The UN Guiding Principles on Business and Human Rights (UNGPR) by the UN Human Rights Council in 2011 is a prime example of a soft law instrument with far-reaching implications.⁴³ Although the

Guiding Principles are non-binding on investors or states, they can shape the overall regulatory environment in which companies operate and their expectations and actions with respect to human rights, environment, and other issues critical for the development of communities and countries. The principles cover not only the operations of the company itself, but also those of its suppliers and other business relations.

Governments are encouraged to adopt National Action Plans (NAPs) on Business and Human Rights as part of their responsibility to disseminate and implement the Guiding Principles. The NAPs allow governments to increase policy coherence and coordination, monitoring and evaluation of the implementation of the Guiding Principles, and promotion of transparent dialogue with stakeholders.⁴⁴ The uptake of NAPs has recently accelerated in Asia, with eight countries having started the process for developing these plans (India, Indonesia, Japan, Malaysia, Myanmar, the Philippines, the Republic of Korea and Thailand).⁴⁵

Leading mining companies, through the industry body, ICMM, were closely involved in the consultations which led to the development of the UN Guiding Principles on Business and Human Rights; the ICMM “fully supports” the Guiding Principles.⁴⁶

42 Jailani 2015.

43 United Nations 2011.

44 United Nations Working Group on Business and Human Rights 2011.

45 Business and Human Rights Resource Centre 2017.

46 International Council on Mining and Metals (ICMM) 2017.



Box 7 UN Guiding Principles on Business and Human Rights⁴⁷

The UN Guiding Principles on Business and Human Rights (UNGPR) provides a normative framework outlining the roles of states and businesses in addressing the adverse impact of business operations on human rights. The UNGPR outlines the duty of states to protect human rights, the obligation of businesses to respect human rights, and the role of both states and businesses in providing effective remedies. The UNGPR applies to all states and to all businesses, including small and medium-sized enterprises.



I. The State duty to protect human rights

The Guiding Principles instruct that “States must protect against human rights abuses within their territory and/or jurisdiction by third parties, including business enterprises” and that “States should set out clearly the expectation that all business enterprises domiciled in their territory and/or jurisdiction respect human rights throughout their operations.”

The UNGPR also sets out operational principles for states that address general regulatory and policy functions of the states, such as enforcement of laws and guidance to businesses, and the state-business nexus which includes the conduct of state-owned enterprises, as well as enterprises with which the states make contracts or conduct business transactions. A special set of operational principles considers the heightened measures businesses must employ to ensure respect for human rights in conflict-affected areas. The operational principles also encourage policy coherence between human rights instruments, such as between government agencies, and in dealing with investment treaties and contracts.



II. The corporate responsibility to respect human rights

The UNGPR also requires businesses to respect human rights, “at a minimum, as those expressed in the International Bill of Human Rights and the principles concerning fundamental rights set out in the International Labour Organization’s Declaration on Fundamental Principles and Rights at Work.” Businesses should also seek to mitigate negative human rights impacts which may be caused by them indirectly, through their operations and relationships with other entities in their value chain.

The operational principles require businesses to craft policy commitments towards respecting human rights; to conduct human rights due diligence in all operations; and to provide remedies where operations have had an adverse impact on human rights. Importantly, the Guiding Principles set out expectations that business enterprises should not only comply with applicable laws, but also respect internationally recognized human rights, as well as, “treat the risk of causing or contributing to gross human rights abuses as a legal compliance issue”.



III. Access to remedy

The UNGPR also provides that states must ensure access to judicial and non-judicial mechanisms to remedy business-related human rights abuses, through judicial, administrative, legislative and other means.

The operational principles provide guidance on state-based judicial and non-judicial mechanisms, and non-state-based grievance mechanisms. They also provide effectiveness criteria for non-judicial grievance mechanisms, often maintained by businesses, that relate to legitimacy, accessibility, predictability, equity and transparency.

47 United Nations 2011.

The UN Human Rights Council adopted a resolution in 2014 to set up an intergovernmental working group to elaborate an international legally binding instrument in international human rights law to regulate the activities of transnational corporations and other business enterprises.⁴⁸ Discussions about a treaty on transnational corporations and other business enterprises with respect to human rights are currently ongoing.⁴⁹ These discussions are informed by analysis of the obstacles that victims face in transnational human rights cases, and of the sources of the impunity of corporate entities that operate across different national jurisdictions – primarily in the natural resources industries. The expected treaty, when eventually finalized, would be the first international human rights agreement to specifically and explicitly regulate the activities of transnational corporations with respect to the fundamental rights of individuals and communities.

Another important normative instrument is the OECD Guidelines for Multinational Enterprises, adopted by 42 countries.⁵⁰ The OECD Guidelines cover issues such as human rights, employment and industrial relations, environment, combating bribery, consumer interests, science and technology, competition and taxation. The significance of the OECD Guidelines is that they have been adopted by governments of mostly developed countries – the home countries of most multinational companies, which have regulatory power over these companies.

Overall, whereas international law provides strong and effective protection for investors, it is still a long way from providing similarly strong protections for people affected by investment, including mining investment. To strengthen the protection of human rights in order to balance with the protection of investors' interests, governments should make their domestic laws and regulations consistent with their international human rights commitments; they should also seek to incorporate the principles and guidance within soft laws into their legal and regulatory framework to protect people affected by mining.

4.3.3 Environmental conventions and treaties

There are various instruments in international environmental law that are relevant for the environmental regulation of the mining industry. These include conventions and treaties on mineral waste, water quality, nature preservation, biodiversity, air pollution and climate change.⁵¹

Mineral hazardous waste and recovery

About 95 percent of all toxic and hazardous chemicals fall into the four industry groupings of toxic metals, petrochemicals, pesticides and radioactive materials.⁵²

An international treaty that is directly relevant to the (gold) mining industry is the 2013 Minamata Convention on Mercury.⁵³ It envisages the controlled use and progressive removal of mercury from circulation, due to its significant negative impacts on human health and the environment.

The strictest treaties include outright bans on imports and exports of hazardous wastes. The 1991 Bamako Convention bans imports into Africa, but permits States in each region to trade with each other, subject to certain controls. The 1989 Lomé Convention bans exports from the European Union to the African, Caribbean and Pacific States parties, except if the importing country has adequate facilities. Another approach has been to allow hazardous waste transfers, subject to protective requirements like notification, informed consent, manifesting and facility adequacy. This has been the approach of the most comprehensive of these treaties, the 1989 Basel Convention on the Transboundary Movement of Hazardous Wastes and Their Disposal.

48 United Nations Human Rights Council 2014.

49 United Nations Human Rights Council 2017.

50 Organization for Economic Co-operation and Development (OECD) 2011.

51 The text in this subsection was contributed by Angela Kariuki, International Environmental Law Unit, UN Environment.

52 Louka 1994.

53 United Nations 2013.



Water quality

International and regional treaties governing water quality include treaties covering marine pollution and pollution of freshwater resources.

Examples of treaties on marine water quality include the 1974 Paris Convention for the Prevention of Marine Pollution from Land-Based Sources (applicable to parts of the North Atlantic, Arctic Ocean and North Sea), the 1972 Oslo Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft and the 1973 London International Convention for the Prevention of Pollution from Ships (MARPOL) and its 1978 Protocol.

Several freshwater systems are also the subject of transboundary pollution treaties with implications for mining. Other treaties cover international watercourses and water bodies, groundwater, and multi-state and regional waters in Africa, the Americas, Europe and the Middle East. For example, the 1978 United States-Canada Great Lakes Water Quality Agreement could be applied to mining in one country which causes pollution in the other.

Nature preservation

The Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar) (1971) provides the framework for international cooperation in the conservation and wise use of wetland biomes. Parties are obliged to list and protect at least one Wetland Site of International Importance in their countries, include wetland conservation within national land-use planning, and promote the wise use of wetlands.

The Bonn Convention on the Conservation of Migratory Species of Wild Animals (CMS) (1979) aims to conserve avian, marine and terrestrial migratory species. It provides a framework within which parties may act to conserve migratory species and their habitats. Parties can adopt strict protection measures for those migratory species in danger of extinction, develop agreements for the conservation and management of migratory species that have an unfavourable conservation status, and undertake joint research and monitoring.

UNESCO's Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) (1972) defines the kinds of natural and cultural sites that can be considered for inclusion in the World Heritage List. It also sets out the duties of states in identifying potential sites, and their role in protecting and preserving these sites. Mining and petroleum developments should be aware of any existing or potential World Heritage Sites in the vicinity, and take steps to protect them from any adverse environmental impacts that arise from development activities. The International Nature Conservancy Union (IUCN), an international nature conservation NGO, has agreed with ICMM, the mining industry's peak body, on a number of "no-go" World Heritage sites.⁵⁴

There are also similar regional treaties for the Americas, Africa, Europe and Asia. These include the 1985 ASEAN Agreement on the Conservation of Nature and Natural Resources.

Biodiversity

The Convention on Biological Diversity (CBD) has three main goals: the conservation of biodiversity; the sustainable use of the components of biodiversity; and sharing the benefits that arise from the commercial and other use of genetic resources in a fair and equitable way. The preservation provisions of the CBD have the most immediate relevance to extractive operations, particularly mining.

Air pollution and climate change

Air pollution from extractive operations, particularly mining, smelting and related operations is still regulated chiefly by national laws. However, there are several international air laws that have potential implications for the future of the extractive industry.

A growing body of regional treaties governs transboundary air pollution. The 1979 Convention on Long-Range Transboundary Air Pollution (LRTAP), with its four protocols setting specific emissions limitations on sulphur dioxide (1985, 1994), nitrogen oxides (1988, 1998) and volatile organic compounds (1991), provides very substantive restrictions on some of the basic mineral beneficiation pollutants in northern hemisphere countries (e.g. Canada, the

54 Buxton 2012.

Russian Federation, the United States and countries of the European Union).

Two notable global treaty regimes – governing ozone and climate change – have long-term implications for the extractive industry. The 1985 Vienna Convention for the Protection of the Ozone Layer, as amended by its 1987 Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Ozone Protocol) and other subsequent adjustments and amendments, requires a rapid phase-out of use and emissions of stratospheric ozone-depleting chemicals, chiefly chlorofluorocarbons (CFCs), halons and carbon tetrachloride, of relevance to some extractive endeavours. Even more significantly, the UN Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol provide the foundation for intergovernmental efforts to address the problem of potentially irreversible climate change resulting from rising concentrations of greenhouse gases in the earth's atmosphere.

4.4 Voluntary standards

Increasingly, the mining industry has come under the spotlight of international media and civil society criticism, and experienced increased conflicts and opposition from local communities. In 2002, the mining industry commissioned a major report critically examining the industry's performance related to wide-ranging issues in sustainable development and identifying ways to improve performance.⁵⁵ The report gave rise to many industry initiatives promoting responsible mining. Several of these initiatives included standards on environmental and social performance of mining (See Box 8). These industry standards have become part of the normative framework in mining, because they guide and shape the actions of mining companies.

Industry standards are usually voluntary and non-binding. However, the standards have been developed by industry experts with intimate knowledge of mining, and most standards provide assurance (certification) that a mining company that commits to these standards, adheres to them. The promise of assurance, combined with the need to meet the expectations of their stakeholders – buyers, shareholders or the general public – provide incentives for mining companies to implement the standards. Some standards also have participatory governance arrangements, involving environmental and human rights stakeholders in their governing or advisory bodies. Without independent oversight through such governance arrangements, the legitimacy of standards can be questionable. In addition to the mining industry, financial institutions and banks have also developed standards which are used as conditions for getting financing.

However, the increasing proliferation of such standards with varying metrics, governance systems of standard-setting bodies, and assurance processes can reduce their usefulness by making it difficult for non-industry practitioners to understand them. A study found that 10 out of 15 such standards or certification schemes covered workers' health and safety, 9 standards covered indigenous peoples and community development, 11 covered human rights, 10 covered waste management, and 5 covered water management.⁵⁹ Therefore, if a mining company is certified by a particular standard, this does not guarantee that this company conducts its business in a socially and environmentally responsible manner, although it is more likely to do so.

In recent years, the China Chamber of Commerce of Metals, Minerals and Chemicals Importers and Exporters (CCCME), with over 6,000 member companies in mining and downstream industries, has adopted guidelines to improve environmental and social responsibility in the industry. Given the rapid increase in outbound investment by Chinese companies, such guidelines were much needed. Their guidelines, developed with GIZ support,

55 International Institute for Environment and Development (IIED) and World Business Council for Sustainable Development (WBCSD) 2002.

56 Franks 2016.

57 Renzo, Franks, and Ali 2015.

58 Dalaibuyan et al. 2016.

59 Renzo, Franks, and Ali 2015.

Box 8 International responsible mining standards^{56, 57, 58}

ICMM Sustainable Development Framework was adopted in 2003 and is a key part of the operations of the international mining industry body, the International Council on Mining and Metals (ICMM, previously ICME). The 10 principles within the framework cover governance, social and environmental performance. Whether member companies adhere to the framework is assured by a third-party assurance body. For more information, see <http://www.icmm.com/document/429>

Initiative for Responsible Mining Assurance (IRMA) Standard for Responsible Mining is a recent standard, first adopted in 2014 and revised in 2016. The standard is applicable to all types of industrial mines, and covers requirements for social and environmental responsibility. The standard does not yet have a certification system. For more information, see <http://www.responsiblemining.net/irma-standard/>

Responsible Jewellery Council (RJC) Code of Practices was adopted in 2009 and revised in 2013. It is applicable for companies along the jewellery value chain, including diamond, gold and precious metals. It covers ethical, social and environmental practices and respect for human rights. Adherence to the Code is certified by a third party. For more information, see <http://www.responsiblejewellery.com/standards-development/code-of-practices-review/>

International Cyanide Management Code (ICMC) was developed in 2000 under the guidance of UNEP and ICME (now ICMM), following a major cyanide spill at a Romanian gold mine. The code is applicable to gold mining companies, as well as producers and transporters of cyanide. Companies which are signatories to the code are verified (certified) by a third party. For more information, see <http://www.cyanidecode.org/>

Aluminium Stewardship Initiative (ASI) Performance Standard was adopted in 2014. It is applicable along the aluminium value chain, including bauxite mining companies. It covers issues of materials stewardship and responsible sourcing. However, it does not yet have a certification scheme. For more information, see <http://aluminium-stewardship.org/asi-standards/>

Bettercoal Code (BC) is adopted by Bettercoal, an organization set up in 2012 by major European utilities. It is applicable to coal mining companies. It covers issues of ethical conduct, social and environmental responsibilities. The assurance process appears to be in progress. The most important incentive for mining companies is that European utilities companies will be more likely to buy coal from a mining company if it is certified as adhering to the code. For more information, see <http://bettercoal.org/>

In addition to standards specific to the mining industry, there is also a generic standard, ISO 14001, which was developed by the International Standards Organization in 2004 and covers environmental management systems within companies. The ISO also provides accreditation. For more information, see <http://www.iso.org/iso/home/standards/management-standards/iso14000.htm>

The best-known standards used by financial institutions are the International Finance Corporation (IFC) Performance Standards and the Equator Principles.

The IFC Performance Standards on Environmental and Social Sustainability were adopted in 2006 (and revised in 2012) and are used as conditions for private sector companies in getting loans from the International Finance Corporation (IFC), part of the World Bank Group which lends to the private sector. They consist of eight Performance Standards: 1) Assessment and management of environmental and social risks and impacts; 2) Labor and working conditions; 3) Resource efficiency and pollution prevention; 4) Community health, safety and security; 5) Land acquisition and involuntary resettlement; 6) Biodiversity, conservation and sustainable management of living natural resources; 7) Indigenous peoples; and 8) Cultural heritage. For more information, see <http://www.ifc.org/performancestandards>

The Equator Principles use the IFC Performance Standards as the basis; they are standards which are adopted by more than 70 investment banks which collectively account for over 90 percent of project financing in emerging markets. For more information, see <http://www.equator-principles.com>

cover issues such as environment, human rights, local community engagement and more.⁶⁰ The CCCMC also developed an action plan to promote awareness about corporate social responsibility among Chinese mining companies, provide recognition for good performance, and improve their public image.

Even the best standards are not a substitute for binding legal provisions. Nevertheless, given the evolving nature of environmental and social laws and regulations in developing countries and the capacity constraints of government institutions, the existence of such standards is an important contribution to mitigating the environmental and social impacts of mining. The role of governments with respect to voluntary industry standards could include: staying abreast of such standards and the adherence of companies to these standards.

4.5 Customary rules

Customary rules⁶¹ related to land tenure are particularly relevant to mining, and can be considered as another important part of the normative framework for mining. In many developing countries, as well as in territories of countries populated by indigenous peoples, customary rules are used in regulating land tenure.

In contrast to statutory land tenure systems, which are codified in the law, customary land tenure systems are regulated through unwritten rules and practices used by local communities which are shaped by cultural and historical relationships of the people with the land. These rules define the ownership, use, management and transfer of land.

Common lands such as forests and pastures have been historically governed by customary tenure rules. Forests and pastures span large areas and, in some countries, large numbers of people depend on these lands. For instance, forests account for half or more of the total area of countries such as

Cambodia, Indonesia, the Lao People's Democratic Republic, Malaysia and Myanmar.⁶² In Indonesia, it is estimated that about 50 million people live in forest areas and another 20 million live in nearby villages, depending on forest resources.⁶³ Pastures account for 71 percent of agricultural land in Asia and Australia.⁶⁴

In many countries, customary tenure systems have been overridden by statutory tenure systems. Laws consider such common lands as land “in the public domain”, belonging to the state. In many countries, governments do not recognize customary land tenure and even in countries where such land tenure is recognized, land rights based on such tenure systems are insecure.

The insecurity of land rights defined by customary rules comes to the fore when companies discover the economic potential of mining, oil, gas, logging and agriculture in these lands and seek legal rights to exploit these resources – through licences, permits and concessions from governments. Worldwide liberalization of mining laws in the 1980s and 1990s, followed by the mineral and oil ‘supercycle’ – the unprecedented rise in prices of minerals and oil in the 2000s – led to increased mineral and oil exploration and extraction in areas less explored until recently, which intensified pressure on indigenous territories and common lands. In many countries, governments issue licences and concessions for resource exploration and exploitation, but fail to recognize and to take effective action to protect land rights of indigenous peoples and other peoples dependent on these lands. Indonesia is a stark example of this trend: as of 2008, there were 71 million hectares of forest lands under timber and oil concessions, as opposed to 0.23 million hectares of forest lands designated for and owned by communities and indigenous groups.⁶⁵

There is overwhelming evidence that the lack of regard for the rights of peoples inhabiting common and indigenous lands on the one hand, and the disproportionate power of mining, oil, gas,

60 China, Chamber of Commerce of Metals, Minerals and Chemical Importers and Exporters (CCCMC) 2014.

61 Customary rules are rules derived from consistent practice and have thus become the norm.

62 Quizon 2013.

63 2004 estimates. Bachriadi and Sardjono 2005, quoted in Quizon 2013.

64 2009 estimates. Calculated based on figures from Lutzenberger, Brillinger, and Pott 2014, p. 36 and 42.

65 Quizon 2013, Annex 4b.



large-scale agriculture and forestry companies on the other hand has led to the displacement, dispossession and further impoverishment of indigenous peoples and other peoples deriving their livelihoods from these lands; the use of force to silence local leaders and activists and other human rights violations; and conflicts between resource exploitation companies, local communities and governments.^{66, 67, 68}

The balance of power is shifted even further in favour of companies when the country in question becomes a party to international investment treaties (which is the case today in virtually all countries). Investment treaties provide wide-ranging and effective protections for investors' rights, to the extent that actions taken by governments to safeguard the rights of and mitigate negative impacts of natural resource investments on local

Box 9 International normative instruments relevant for protecting customary land tenure

It is within the purview of governments to address thorny issues arising from the conflict of customary rules governing land tenure in their countries and statutory law governing mining permits. Governments can and should make use of international normative instruments which provide guidance. The two sets of normative instruments below provide general guidance on protecting rights, while the third provides specific guidance with respect to land tenure.

International human rights law provides protections for the rights of indigenous peoples and peoples dependent on lands. The ILO Convention 169 (1989)⁶⁹ was the first legal instrument which substantiated and reinforced the rights of indigenous peoples. Moreover, it is legally binding on the states that ratified it. However, to date, no countries in Asia have ratified this convention. The adoption of the Declaration of the Rights of Indigenous Peoples (UNDRIP)⁷⁰ by the UN General Assembly in 2007 was significant – most countries have ratified the UNDRIP. As its name implies, UNDRIP is non-binding, but it refers to rights specified in human rights covenants, which are binding.

The UN Guiding Principles on Business and Human Rights, supported by some of the world's largest mining companies, provides a clear framework and a guide on what governments and businesses should do to protect, respect and remedy human rights (See Box 7).

A key normative instrument focused on tenure of land is the Voluntary Guidelines on the Responsible Governance of Tenure endorsed by the Committee on World Food Security. The Voluntary Guidelines state that “States should provide appropriate recognition and protection of the legitimate tenure rights of indigenous peoples and other communities with customary tenure systems”.⁷¹ The Guidelines recommend that States should hold “good faith” consultations with indigenous peoples before initiating any resource project and promoting their effective participation in decisions regarding their tenure systems. The Guidelines also provide recommendations for strengthening land tenure systems, such as legal recognition and allocation of tenure rights in a way that is consistent with the obligations and voluntary commitments of countries under international laws and instruments, providing systems to record individual and collective tenure rights, and determining conditions for responsible investments.⁷²

66 United Nations Department of Economic and Social Affairs (UNDESA) 2009.

67 Minority Rights Group International 2012.

68 Minority Rights Group International 2016.

69 International Labour Organization (ILO) 1989.

70 United Nations 2007.

71 Committee on World Food Security 2012.

72 Ibid.

communities and indigenous peoples can give rise to litigations against these governments and the costly settlement of claims (See Section 4.3.1 on investment treaties).

The most direct and devastating impacts of mining projects on people are physical and economic displacement. Despite making statements to improve the livelihoods of resettled people, many mining companies focus their resettlement measures merely on building housing and, in some cases, physical infrastructure. Most companies fail to take measures to rebuild livelihoods during the post-relocation phase.⁷³ Civil society has documented the overwhelming negative impacts of mining-induced resettlement, including impoverishment and the loss of social support networks.⁷⁴ At the same time, national legislation is often inadequate or is simply missing the key elements required to address the impacts of resettlement.⁷⁵

Safeguarding the rights of indigenous peoples and other peoples over communal lands – such as forests and pastures – is important for improving food security, preventing poverty and the sustainable management of these lands.

The first step towards protecting customary land rights is the legal recognition of these rights – often with respect to indigenous peoples and other communities dependent on land. In Papua New Guinea, the Constitution recognizes the property rights of forest people over these forests.⁷⁶ India's Scheduled Tribes and Other Traditional Forest Dwellers Act 2006 recognizes the environmental and human rights of tribal people.⁷⁷ The Philippines Indigenous Peoples' Rights Act (IPRA) 1997 recognizes ancestral lands of indigenous people and provides protections of their rights over these lands, and requires the state and concession holders to consult with indigenous people and to obtain free, prior and informed consent.⁷⁸

Land registers and cadastres are necessary for the protection of land rights of indigenous peoples and other peoples dependent on land. Without such records, even when the rights are recognized, they are not protected. For instance, even though in the Lao People's Democratic Republic the constitution recognizes communal land use rights, and in Papua New Guinea forest people's rights are constitutionally recognized, due to the absence of land records, this recognition does not prevent the issuance of land and forest concessions that infringe on the rights of people dependent on these lands. The Philippines, however, has been conducting the process of recording and awarding indigenous land titles. By 2015, the Philippines National Commission on Indigenous Peoples issued 173 communal land titles covering an area of 4.5 million hectares and 257 individual land titles covering about 17,000 hectares to indigenous peoples.⁷⁹ Systematic land registrations have also been done quite successfully in Chile, Ethiopia and Rwanda.⁸⁰

The legal framework should also require obtaining consent to natural resource exploitation projects from indigenous peoples and other peoples dependent on land. However, there are not many examples of countries that set such requirements. One notable example is the Philippines. The Philippines Indigenous Peoples' Rights Act, as noted earlier, requires obtaining free, prior and informed consent. In Australia, the Native Title Act 1993 gives indigenous peoples the right to negotiate agreements, but not the right to give (or withhold) consent. The Northern Territory in Australia, however, provides stronger protections to indigenous peoples – the Aboriginal Land Rights Act 1976 has some provisions for indigenous peoples to give their consent for mining activities on their land.⁸¹

73 Adam, Owen, and Kemp 2015.

74 Ibid.

75 Vivoda, Owen, and Kemp 2017.

76 Quizon 2013.

77 Ibid.

78 Minority Rights Group International 2012.

79 United Nations Development Programme (UNDP) 2015.

80 Kasimbari 2017.

81 Rumler 2011.



RECOMMENDATIONS

Orienting legal frameworks towards sustainable development

Making domestic laws and regulations coherent with each other and sufficiently detailed to function as the core set of instruments for governing mining

Improving coordination between government agencies and between national and subnational governments

Considering moving from contract-based regimes to law-based regimes, avoiding using mining contracts to fill legal and regulatory gaps

Considering establishing model agreements which provide the policy space for environmental and social laws of the country, and limiting terms that are open to negotiations

Where mining contracts are made, paying special attention to provisions related to environmental impact mitigation, mine closure, resettlement, local content and employment

Ensuring transparency of mining contracts, including disclosure of beneficial ownership

Assessing implications of international investment treaties on the country's commitments to sustainable development, human rights and the domestic policy space; negotiating terms in investment treaties to minimize these negative implications

Incorporating or strengthening the principles of consultation with local communities and free, prior and informed consent (FPIC) in domestic laws and regulations; and establishing or strengthening state remedy mechanisms for people affected by mining

Making use of voluntary standards developed by and for the mining industry, encouraging responsible mining investments and recognizing companies that adhere to strong standards

Recognizing and progressively registering customary land rights to protect poor and marginalized rural communities and indigenous peoples.



Protecting the environment and people

About **75 percent of mines close prematurely**, leaving legacies of environmental impacts and large costs for the public.

India, Mongolia and the Philippines have **adopted requirements for companies to consult with communities** when conducting Environmental Impact Assessments.

Out of 85 National Human Rights Institutions recognized under the Paris Principles, **31 were accredited to handle grievances**, as of 2008.

5



The negative environmental and social impacts of mining are well recognized. Through environmental regulation, monitoring and enforcement, as well as coordinated action within the government and with mining companies, many environmental impacts can be mitigated. Increasingly, consulting with and involving communities in decisions on mining that affects their lives is recognized as critical for protecting the rights and livelihoods of these communities, as well as for the sustainable management of lands and natural resources.

5.1 Trends and approaches in environmental regulation of mining

Until the 1970s, most countries did not have sound environmental regulation – they largely let companies work without requiring them to prevent or clean up pollution. Undoubtedly, the world had made much progress since then. The paradigm has shifted from the ‘pollutee suffers’ to the ‘polluter pays’ principle.⁸² There is now consensus that polluters – rather than societies – need to bear the cost of pollution. Reflecting this consensus, environmental regulation has become more stringent around the world in the past decades.⁸³

While there are tensions between the objectives of attracting investment into mining and protecting the environment, evidence shows that it is possible to have *both* strong environmental regulation and a favourable investment environment in mining. For instance, several Latin American countries – Argentina, Bolivia, Chile and Peru – adopted competitive mining regimes aiming to attract investment into mining in the 1990s, and at the same time strengthened environmental provisions in their laws or constitutions.⁸⁴ Mining investor surveys and other studies show that in countries with stable political and legal institutions, strict environmental regulations do not affect companies’

decisions, although this may not be necessarily true for politically unstable countries.⁸⁵ This finding is more applicable to multinational mining companies, which need to comply with environmental regulation in different jurisdictions – typically, more stringent regulation in developed countries – and thereby accumulate experience in meeting higher regulatory standards than is typically present in developing countries. However, mining companies from developing countries are more sensitive to environmental regulations.⁸⁶

Apart from raising regulatory standards, more governments are experimenting with or using non-traditional approaches to environmental regulation, such as performance standards and economic instruments.

Traditionally, governments have used prescriptive approaches to environmental regulation (also called technology standards), which specify concrete technologies to be used for mitigation of pollution. In contrast, performance-based regulation specifies targets for environmental performance. Whereas technology standards are more effective in industries with a high degree of technology standardization, performance-based regulatory standards work better in situations where technologies and environmental conditions differ significantly from one project to another. Under performance standards, the decision on how to mitigate pollution is left to companies, thus allowing space for technological innovation. For example, rather than specifying the angle of the slope for landforms made up of piled up waste rock, the government of Quebec, Canada, specifies a factor of stability for such landforms.⁸⁷

Economic instruments are now widely used to influence the environmental performance of companies. These include taxes, fees and subsidies that incentivize companies to use better technologies to reduce pollution or improve resource efficiency. For example, in Mongolia, the government raised water-use fees sixfold in 2013,

82 For an illuminating discussion about these principles of environmental regulation in mining, see Warhust 1999.

83 Söderholm et al. 2014.

84 Bastida 2002.

85 Söderholm et al. 2014.

86 Ibid.

87 Jones 2011.

which resulted in a significant increase in the water recycling rate in mining operations. In Peru, the government set up a US\$120 million fund to co-fund industrial technical innovation, including innovation in mining.⁸⁸ Mine closure bonds⁸⁹ have also been used to prompt companies to do proper mine closure, land reclamation and rehabilitation (See Section 5.5.2 on Financing mine closure).

Under certain conditions, these non-traditional forms of regulation – performance standards and economic instruments – can incentivize companies to devise more innovative solutions and cleaner technologies in a more cost-effective manner, and to make use of innovative practices. In the past decade, the mining industry has made technological advances in managing water and waste metal toxicity, and developed good practices in mine closure, land rehabilitation and biodiversity protection (offsets).⁹⁰ These non-traditional approaches can be beneficial for the competitiveness of mining companies and at the same time help achieve better environmental performance. However, these approaches to environmental regulation require high capacity and knowledge of regulatory agencies and mining operators. In countries where mining operators are relatively small and inexperienced, setting clear, unambiguous technology standards might achieve better outcomes.

Another trend in regulation is the greater recognition of social impacts and enabling communities affected by mining to have a say in mining-related decisions and processes. The international human rights community, indigenous peoples and civil society organizations have led a movement revolving around the concept of free, prior and informed consent (FPIC), with large players in the mining industry increasingly coming on board. Developing country governments have been slow to accept community consultation and engagement; nevertheless, community consultation is now increasingly adopted as a rule in laws and regulations – particularly in environmental laws and regulations.

5.2 Environmental and social impact assessment

A family of tools on environmental and social impact assessment is used for the mitigation and prevention of the environmental and social impacts of industrial activities – including mining.

Environmental impact assessment (EIA) was initially developed in the United States in the 1970s, was later adopted by developed countries, and has now been adopted by most developing countries. The EIA is accompanied by the Environmental Management Plan (EMP).

Since mining is considered one of the most polluting industries, the preparation of EIAs and EMPs (hereinafter “EIAs/EMPs”) is compulsory for mining projects in most countries.⁹¹ EIAs/EMPs serve to inform the mining company, the government, affiliated stakeholders and the public of the environmental consequences of implementing a mining project and identify mitigating actions. In its narrow form, EIAs are a project-based process. Their scope is thus limited to mining projects within the formal mining sector.⁹² This limitation of scope allows for the assessment to specify concrete actions to mitigate impacts, with clear accountability for implementing and financing those actions. Over time, EIAs have expanded in scope, both thematically and geographically. Greater recognition of social, human rights and gender impacts of mining prompted the development of specialized impact assessment tools. EIAs now increasingly include social impact assessment. Cumulative and strategic impact assessments are also carried out in regions and countries with extensive mining activity, for example, before opening an area for mining (See Box 10).

88 Masson, Walter, and Priester 2013.

89 Technically, mine closure bonds are not taxes. They are returned (relinquished) to companies upon satisfactory land reclamation and rehabilitation (See Section 5.5.2 on Financing mine closure).

90 Buxton 2012.

91 However, for mining exploration projects, some countries do not require EIA at all, or require a simplified EIA.

92 In the case of oil and gas, an EIA is done for a block of assets collectively.



Box 10 Environmental and social impact assessment tools

EIA (Environmental Impact Assessment) as a process: An EIA provides the environmental baseline before the start of the project, evaluates the likely impact of the project, and proposes how impacts are to be monitored and how are they to be mitigated.⁹³ A typical EIA report includes the following parts: a) description of the project, b) project alternatives, c) environmental baseline, d) identification and evaluation of likely impacts, e) monitoring plan; and f) environmental management plan (EMP).⁹⁴

In a narrow sense, the EIA refers only to the immediate process of assessing environmental impacts of a project, which includes feasibility studies, baseline studies and impact studies. In a broad sense, EIA refers to the comprehensive process which consists of screening, general and detailed environmental impact assessment, public consultation, preparation of an EIA report, preparation of an Environmental Management Plan, and their review and approval by the government. EIA is often used as an umbrella term which covers the entire family of environmental and social impact assessments.

EIA versus EIS (Environmental Impact Statement): In general, EIA is a process, while an EIS is a *statement* or a report documenting the EIA process. However, some jurisdictions may refer to the EIS as an “EIA report”. Other jurisdictions use the terms “EIA” and “EIS” interchangeably. To avoid confusion, the exact legal terms of the particular jurisdiction should be used.

EMP (Environmental Management Plan): While EIA is an assessment of impacts, an EMP is a plan for mitigating these impacts. In some jurisdictions, an EMP is treated as part of the EIA report, while in others it is a separate document. For large mining projects, there can be several EMPs joined together in a “master” EMP, such as separate EMPs for mine camps, underground mines, waste water management and tailings management.

Full EIA versus simplified EIA: In many jurisdictions, a simplified version of an EIA may be conducted before the mining exploration phase, followed by a full EIA before the mine development. Typically, small-scale mining projects can undergo simplified EIAs. For instance, the state of Queensland in Australia differentiates mining projects by scale of investment, land used, or ore extracted, while Canada differentiates them by the severity of potential environmental impact to determine whether projects require a simplified or a full-fledged EIA. Again, terminologies differ in various jurisdictions.

ESIA (Environmental and Social Impact Assessment) or SIA (Social Impact Assessment): While the earlier generation of EIAs looked at the impact of mines on the biophysical environment, new generation EIAs increasingly incorporate assessment of the impact on people, expanding to ESIA (Environmental and Social Impact Assessment). Large mining projects may carry out separate Social Impact Assessments (SIAs) in addition to EIAs.

In addition, in recent years other specialized social impact assessment tools have been developed:

- **HIA (health impact assessment)** assesses the health impacts of mining projects using quantitative, qualitative and participatory techniques. The World Health Organization supports HIA and offers a variety of tools and initiatives to improve health and well-being.
- **GIA (gender impact assessment)** enriches social impact assessment by analysing the impact and mitigation actions with a gender lens, focusing on the impacts on women and girls. Gender impact assessment (GIA) is a subset of SIA or ESIA.

93 USAID, US EPA, INECE, and CACED 2011.

94 The EMP may be separate from the EIA report, or be part of it, depending on the legal requirements of the host country.

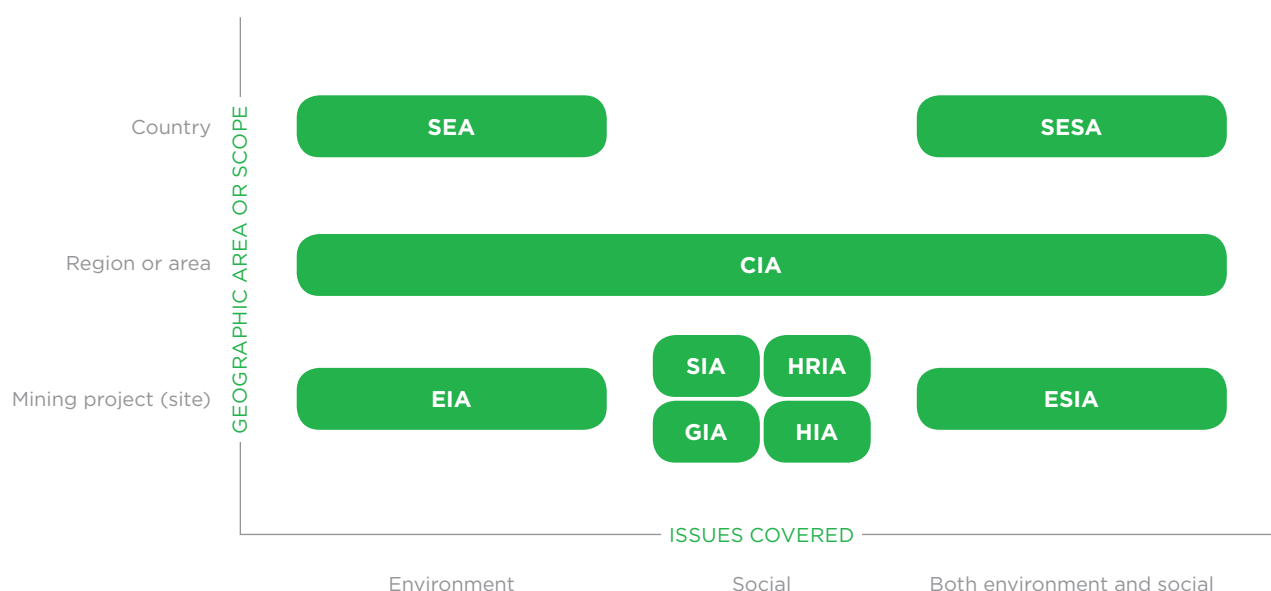
- **HRIA (human rights impact assessment)** is used for identifying, understanding, assessing and addressing the adverse effects of a mining project on the rights of impacted people such as workers and community members. HRIA is an emerging practice.⁹⁵

Cumulative EIA: In contrast to EIA, cumulative EIA (also referred to CIA – Cumulative Impact Assessment, or CEA – Cumulative Environmental Assessment or Cumulative Effects Assessment) extends beyond an individual mining project. Cumulative EIA assesses the impacts of several mining projects on a given area. It is also suitable for assessing impacts of artisanal and small-scale mining.

SEA (Strategic Environmental Assessment) and SESA (Strategic Environmental and Social Assessment): These assess impacts at the policy or programme level. In this regard, SEA allows considering alternatives over the long term and over a larger area – such as an entire region or a country or a sector. For example, SEA can be used in considering whether to open a particular region for mining projects, or in considering changes in mining royalties and the ensuing implications on mining activity.

Figure 5 shows how these types of impact assessment differ from each other in terms of geographic area covered, and the scope of issues covered by the assessments.

FIGURE 5. THE FAMILY OF ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENTS



95 Götzmann 2014.



An EIA is conducted before any mining project activities are carried out on the ground. In some countries, an EIA must be approved (environmental permit issued) before a mining licence is issued, while in others, it is approved after the issue of the mining licence, but before carrying out earth works.

Legislation should clearly specify the roles of various stakeholders with respect to EIAs.

- **Government authorities** usually define the terms of reference for conducting an EIA. After an EIA is conducted, they are responsible for reviewing the EIA, and making a decision whether to clear the project, not clear the project, or clear the project only after modifications. They are also responsible for monitoring the impacts of the project and monitoring the implementation of the Environmental Management Plans.
- **Mining companies** (project proponents) are responsible for conducting or commissioning an EIA. Mining companies are better placed to do this because of their skills and the project information they have access to.
- **Independent experts or environmental services companies** conduct the EIA in many jurisdictions. Since these experts or companies are usually paid by the project proponent to conduct the EIA, concern about conflicts of interest exist. This concern can be addressed by a strong system of accreditation of experts or environmental service companies, on the basis of their technical capacity and ethical conduct.
- **Individuals and communities affected by mining, and civil society organizations supporting them** should play key roles in EIA and ESIA processes. A growing number of countries require affected individuals and communities to be consulted with during the EIA process. Communities and civil society organizations are also increasingly involved in monitoring the impact of mining and the implementation of Environmental Management Plans. They also play an important role in mine closure planning. (See Section 5.5 on Managing Mine closure). However,

merely enabling community participation in EIA processes is not enough, since understanding and mitigating the environmental impacts of mining also requires knowledge of science.

The EIA provides the environmental baseline before the start of the project, evaluates the likely impact of the project, and proposes how impacts are to be monitored, and how are they to be mitigated.⁹⁶

In Asia and the Pacific, most countries have adopted requirements for conducting EIAs and preparing EMPs before the start of mining exploration and extraction projects.⁹⁷ However, legal and regulatory frameworks are still evolving in most developing countries in the region, while the implementation and enforcement of environmental regulations lag behind laws.

More countries are adopting laws and regulations that require mining companies to consult with local communities to be affected by mining. The entry points for local community consultation are often through the EIA process. For example, in India, the 2006 revision of the EIA Notification made public hearings mandatory for all category A (large-scale projects) and B1 projects (smaller-scale projects),⁹⁸ consisting of on-site public hearings, additional consultations and written concerns. Public hearings, where the public can express and record their grievances, are conducted by the government, rather than the mining companies. In the Philippines, the EIA regulation consists of the Presidential decree (1978) and implementing rules and regulations which have revised the regulation several times. The latest revision, through the Administrative Order No. 2003-30 on EIA, provides for public consultation at the scoping stage of the EIA, and provides guidelines for conducting these consultations. In Mongolia, the Law on EIA was overhauled in 2012. Major changes to EIA procedures included requirements to consult with local residents affected by the project, to develop an Environmental Management Plan (EMP), and to report on EMP implementation to local communities and governments.

⁹⁶ For more specific guidance on EIAs in the mining sector, see USAID, US EPA, INECE, and CACED 2011; Environmental Law Alliance Worldwide 2010; and International Atomic Energy Agency 2005.

⁹⁷ It is common to require simplified EIAs before mining exploration, and full-fledged EIAs before mining extraction, although terminology and the scope of such EIAs differ. For example, such two-tiered systems are in place in Indonesia (Mining Law 2009), the Lao People's Democratic Republic (Environmental Protection Law 1999, and Regulations on the Process of ESIA of the Investment Projects and Activities 2012) and Mongolia (Environmental Impact Assessment Law 2012).

⁹⁸ B2 mining projects that do not require public hearings include earth and sand mining on areas below 25 hectares.

5.3 Environmental monitoring and auditing

Environmental monitoring is conducted by both governments and mining companies.

Mining companies conduct environmental monitoring by tracking environmental and social indicators in accordance with the environmental monitoring plan, which is usually part of the environmental management plan (EMP). Environmental monitoring at a project level acts as an early warning system, informs company management, and serves as the basis for environmental auditing, inspection and enforcement.

Governments conduct environmental monitoring through inspections to verify whether mining companies are implementing the actions they committed to in their environmental management plans, and whether these actions are effective in mitigating environmental impacts. Governments usually rely on monitoring data and information provided by mining companies.

The frequency of government inspections can be determined using a risk-based approach, whereby larger mines or mines with higher risk are inspected more frequently and in greater detail. In regulation based on technology standards, environmental monitoring focuses on ascertaining whether the required technologies are implemented, whereas in regulation based on performance standards or economic instruments, monitoring focuses on whether the required performance targets are achieved (See Section 5.1 on Trends and approaches in environmental regulation of mining).

In developing countries, government capacities to monitor the environmental performance of mining are limited. Government agencies need more trained personnel and organizational capacity. Key government agencies, such as mining ministries and licensing authorities; environmental ministries and agencies; and local government also need to coordinate with and learn from each other, for example through joint site inspections. Many government authorities also need better capacity to interact with mining companies, affected communities and civil society organizations in the monitoring processes.

Box 11 Strengthening monitoring and enforcement in mining in Lao PDR and Myanmar⁹⁹

The UNDP-UNEP Poverty-Environment Initiative (PEI) supported the Ministry of Planning and Investment (MPI) of the Lao People's Democratic Republic to create and manage an investment compliance database that seeks to improve monitoring of the compliance of investors with environmental and social safeguards and other requirements. The National Investment Compliance Database covers concessions for agricultural activities, mining and electricity and captures essential data pertaining to licensing, taxes, duties, MoUs, concession agreement information, data on environmental and social obligations and other related information crucial to the management and monitoring of the quality of investments. Much of the data stem from information obtained during the initial investment approving procedures.

In Myanmar, the UNDP-UNEP PEI supported the capacity of the Directorate of Investment and Company Administration (DICA) to promote quality investment in natural resources. It conducted a legal review of 23 national laws, their associated regulations and procedures, as well as 5 national policies relevant to the mining sector, identifying overlapping and contradictory measures. The review also supported DICA and other government departments with mandates for environmental or social management to identify priority sites to better monitor environmental and social impacts in a coordinated manner and to improve compliance.

⁹⁹ The text in this box was contributed by Samara Yawngnwe, PEI Myanmar and Chitlatda Keomuongchanh, PEI Lao PDR, and is complemented by the UNDP-UNEP Poverty Environment Initiative (2015), "Asia-Pacific PEI Internal Review".



Communities and civil society groups have several paths available to influence environmental regulation in mining:

- Participating in environmental monitoring
- Demanding public access to documents such as EIAs and EMPs
- Providing relevant information and findings and making requests to elected representatives or relevant government agencies
- In cases of significant violations, publicizing them to leverage public opinion, raising grievances through alternative dispute resolution mechanisms, or litigating against the mining company or the government.¹⁰⁰

Environmental auditing is conducted to provide in-depth information on environmental performance and compliance against established standards, impact mitigation plans, and potential environmental liabilities. Environmental audits do not replace environmental monitoring. They include internal audits and external audits. Internal audits are also called first party audits, as they are carried out or commissioned by the mining company. External audits include second party audits, carried out or commissioned by the government, lender or investor, and third party audits, carried out by an independent party.¹⁰¹

In addition to project-specific audits, environmental audits can also be industry-wide or regional. Such audits of broader scope are conducted or commissioned by the government, particularly audit agencies. For instance, in 2013, the Audit Office of Queensland, Australia conducted an audit of the resources sector (mining, oil and gas) in the state, to see “whether monitoring, supervision and enforcement of environmental conditions for resource and waste management activities is effective and protects the [Queensland] state from liability for rehabilitation and the environment from harm”.¹⁰²

Governments can support the involvement of civil society organizations by requiring mining companies to provide access to mining contracts, EIAs, EMPs and environmental monitoring information; requiring third party verification of and participation in environmental monitoring; and helping develop the capacity of civil society organizations.

5.4 Community consultation, engagement and protection

While the entry points for community consultation and engagement in mining projects are opening in some countries through their EIA laws and regulations, community engagement is much broader than the EIA process – it is done not only for the sake of impact assessment. Engaging communities is important in its own right. It also helps to balance economic development considerations with social and environmental considerations, leading to decisions that are more sustainable and viable politically and socially.¹⁰³ Reflecting a shared understanding of the international community about the importance of citizens’ engagement for environmental sustainability, Principle 10 of the Rio Declaration 1992 states that “Environmental issues are best handled with participation of all concerned citizens, at the relevant level”.¹⁰⁴ The Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development, in its Mining Policy Framework, recommends to its member states “making consultation with affected stakeholders a requirement of the permitting process and at every stage of the mining cycle”.¹⁰⁵

In making decisions about mining projects that affect the lives of people in local communities, governments and mining companies should engage them. The engagement should start before exploration and continue throughout all phases in the life of the mining project.

100 Litigation can be done by civil society if laws enable representational litigation on behalf of the person suffering the damage.

101 United Nations Conference on Trade and Development (UNCTAD) and United Nations Environment Programme (UNEP), n.d.

102 Queensland Audit Office, Australia 2013.

103 Buxton and Wilson 2013.

104 United Nations Conference on Environment and Development (UNCED) 1992.

105 Intergovernmental Forum on Mining, Minerals 2013.

5.4.1 Free, prior and informed consent

The rights of indigenous peoples to have a say in decisions that affect their lives is established in the international human rights law through the principle of free, prior and informed consent (FPIC). These human rights instruments include the ILO Convention 169 of 1989 and the UN Declaration on the Rights of Indigenous Peoples (UNDRIP) of 2007. UNDRIP affirms the obligations of states to obtain free, prior and informed consent of indigenous people before making decisions or taking actions that might affect indigenous peoples, such as relocation of indigenous peoples, removal of their property, administrative decisions, approval of projects affecting their territories, storage or disposal of hazardous waste on their territory.¹⁰⁶

The acceptance of the right of indigenous peoples to free, prior and informed consent has grown significantly in the 2000s in the international business community – including the mining industry. This growing acceptance is manifested in and has been further influenced by the following developments. In 2011, the UN adopted its Guiding Principles on Business and Human Rights, which provided a framework for protecting, respecting human rights and remedying rights violations and infringements (See Box 7). The OECD strengthened human rights standards by updating its Guidelines for Multinational Enterprises in 2011 – and since most multinational enterprises are domiciled in OECD countries, these guidelines potentially have far-reaching implications. In 2012, the IFC, the private sector lending arm of the World Bank Group, included the principle of free, prior and informed consent in its “Performance Standards on Environmental and Social Sustainability” (revised from its 2006 version), which became a standard and a reference for banks and lending institutions. In 2013, the international mining association – the International Council on Mining and Metals (ICMM) – updated its Position Statement on Indigenous

Peoples and Mining which requires its members to work towards FPIC and to respect human rights.

While the right to free, prior and informed consent focuses on indigenous and tribal peoples, it is also broadly applicable to other ‘land-connected peoples’, such as traditional and local communities that live in or adjacent to areas where development projects are located.¹⁰⁷ This broader applicability of the right to free, prior and informed consent is particularly relevant for affected communities in countries which do not recognize indigenous peoples in their laws, countries that have not been colonized, or countries that do not differentiate between indigenous and non-indigenous peoples.

Obtaining free, prior and informed consent is not limited to obtaining one-time consent before a decision to start a mining project. According to the World Commission on Dams, FPIC “involves a continuous, iterative process of communication and negotiation spanning the entire planning and project cycles”.¹⁰⁸ In its report, IIED also argues that companies can build trust and respond to local issues by implementing the “spirit of FPIC” – by engaging communities throughout the life of the project and across the value chain.¹⁰⁹ Guidelines for mining companies issued by the OECD and the Australian government recommend continuous engagement of communities through the life of a mining project.¹¹⁰

Another issue is whether obtaining free, prior and informed consent from a community can result in a veto over a project that affects the community. Over the past years, the mining industry – particularly the most visible multinational companies – is gradually accepting the concept of ‘consent’ which implies the possibility of refusal by local communities to give consent. In practice, instances when a community’s refusal to give consent resulted in stopping of a project are rare.

Despite increased acceptance and understanding of the concept of free, prior and informed consent in the mining industry, the implementation of

¹⁰⁶ United Nations 2007.

¹⁰⁷ Buxton and Wilson 2013. According to the Forest Stewardship Council, the definition was further broadened to include pastoralists that may not be physically close to the area, but depend on the area’s natural resources seasonally or in times of hardship.

¹⁰⁸ World Commission on Dams (WCD) 2000, quoted in Buxton and Wilson 2013.

¹⁰⁹ Buxton and Wilson 2013.

¹¹⁰ Organization for Economic Co-operation and Development (OECD) 2017; Australia, Government of. 2016a.



this concept – and engagement of communities consistent with the “spirit of FPIC” – has been limited.¹¹¹ Within the mining industry, it is mostly large multinational mining companies – mining ‘majors’ – that have accepted the concept of FPIC,¹¹² while most mining ‘juniors’ and the rest of the industry are yet to come on board.

Many multinational mining companies have instituted community relations departments and created jobs for professionals to perform community relations functions. However, mining companies’ community engagement processes often remain inadequate even in some of the most visible multinational mining companies. Within mining companies, community relations departments do not closely collaborate with the core engineering departments and often have limited influence on company decisions. And some mining companies tend to view community engagement as a tool for managing their business risks and the risk of conflict with the community rather than for managing risks to communities, or contributing towards the social and economic development of the communities.^{113, 114}

111 Buxton and Wilson 2013.

112 Ibid.

113 Kemp 2009.

114 Owen and Kemp 2013.

5.4.2 Engagement during the life of a mine

Community engagement should continue throughout the life of a mine. Nevertheless, local communities have greater leverage and a stronger negotiating position at specific points during the life of a mine – where laws and regulations provide for the engagement and consent of local communities (such

as during community consultation during ESIA), and at points when a mining company has not yet made substantial investments and has not obtained mining and environmental permits. Community engagement is also critical during planning for mine closure and during the mine closure itself (See Section 5.5 on Managing mine closure).

The modes of engagement range from information-sharing to consultation and collaboration (See Box 12).

Box 12 Modes and methods for community engagement¹¹⁵

Modes of engagement with local communities	Methods of engagement	Good practices in engagement
Information sharing	Public displays, websites, social media, blogs, emails, newsletters, newspaper articles, briefings, and public hearings, presentations, personal visits, reports	Information is provided in languages and forms accessible to the community.
Information and feedback gathering	Stakeholder mapping, key informant interviews, surveys, informal interactions of company employees with local community members and local governments, suggestion boxes, open days, staffed telephone lines	The most impacted people are engaged on a priority basis. Special efforts are taken to engage groups less-often heard, such as women, youth and marginalized groups in communities. Information and feedback gathering do not impose undue burden on community members.
Consultation	Multi-stakeholder roundtables and dialogues, public meetings, small group discussions, household visits	Sufficient advance notice and adequate information are provided to community members. Meetings are held in languages spoken by the community. Consultations do not impose undue burden on community members.
Participation and training	Workshops, focus group discussions, training	Sufficient advance notice and adequate information are provided to community members. Workshops and training sessions are held in languages spoken by the community.
Negotiations	Meetings with formal community representatives, councils, assemblies of locally elected representatives, possibly with a mediator or facilitator	Adequate information is provided in advance, and in many cases capacity-building and training is done before entering negotiations.
Consent	Approval by decision-making bodies, voting	Sufficient advance notice is given. Governance structures of communities, whether written or unwritten, are respected.

¹¹⁵ Adapted from Australia, Government of. 2016a; Organization for Economic Cooperation and Development (OECD) 2017.



5.4.3 Access to information

The quality of community engagement is greatly enhanced if local communities and local governments are able to access information and training which helps to better balance the asymmetry of power in negotiations between communities and mining companies.

Paradoxically, local communities and even local governments may experience opposing problems in accessing information: too little relevant information on the one hand, and too much irrelevant (or unprocessed) information on the other hand. Aggregate data such as nationwide mineral reserves and production may have little relevance to local communities and may even contribute to unreasonable expectations and subsequent alienation from the mining industry. Thick financial and environmental reports are not very useful for local communities unless important pieces of information are extracted and presented in accessible form.¹¹⁶ Necessary information at the local level may include:

- Information on licences sought and allocated in the territory of the local community
- Plans for land use after mine closure
- Mining plans and technologies to be used
- Expected impacts on the environment and people
- Plans for resettlement and compensation
- Mining agreements (such as investor-state agreements and community development agreements)
- Beneficial ownership of the mining company (who controls the company)
- Fiscal revenues that the national and local governments collect from the company
- Plans for buying goods and services and employing people by the company.¹¹⁷

- In addition, local communities will often benefit from training on financial and environmental literacy, and basic information about mining processes and lifecycles, as well as participatory methods and negotiation techniques.¹¹⁸

While it is important for the mining industry to engage local communities and indigenous peoples, it is the responsibility of governments to protect and ensure the realization of internationally recognized human rights. Towards this end, governments should:

- Ensure domestic laws and regulations are consistent with international human rights obligations
- Ensure policy coherence and coherence in actions taken by mining and environmental ministries, human rights commissions and other government ministries and agencies that have implications on engagement of local communities in mining-related decisions
- Enhance access to mining-related information that is important and relevant to local communities and foster a culture of transparency in the government and in the mining industry
- Open legal avenues for local communities and indigenous peoples affected by mining to have a say in mining projects, particularly during the mining and environmental permitting process and in preparation for mine closure
- Define minimum procedures for adequate consultation and consent
- Invest in the capacity of communities affected by mining.

In doing so, governments can make use of the wealth of guidance produced by intergovernmental bodies, human rights bodies, and the mining industry on communities' and indigenous peoples' engagement.¹¹⁹

¹¹⁶ Dalaibuyan et al. 2016.

¹¹⁷ Ibid.

¹¹⁸ Organization for Economic Cooperation and Development (OECD) 2017.

¹¹⁹ See, for example, Australia, Government of. 2016a; Organisation for Economic Co-operation and Development 2017; and International Council on Mining and Metals (ICMM), n.d.

5.4.4 Grievance mechanisms

The UN Guiding Principles on Business and Human Rights emphasizes remedy as part of its three-point framework (protect, respect and remedy) (See Figure 6). Both states and businesses have the duty to address and, where found necessary, to redress grievances. Without access to effective remedy, the state's duty to protect and the businesses' duty to respect human rights will not be realized.¹²⁰

There are four types of grievance mechanisms to provide remedies for affected persons: 1) judicial mechanisms; 2) state non-judicial grievance mechanisms; 3) company-based grievance mechanisms; and 4) third party grievance mechanisms.

Judicial mechanisms, while fundamental for addressing and redressing grievances, often have weaknesses in addressing specialized cases such as those related to mining, environment and human rights. Moreover, laws and regulations might not be coherent enough to provide the basis to make a claim.

Alternative (non-judicial) dispute resolution mechanisms have become increasingly used in the past decade. For instance, public ombudspersons

operate in 120 countries.¹²¹ The increased popularity and use of ombudspersons is prompted by the limited ability of judiciary bodies to address more complex issues that fall outside the confines of the law, as well as the high cost of using judicial processes.¹²² The Philippines government established the Office of the Environmental Ombudsman to address specialized environmental cases. National Human Rights Commissions (NHRCs) are important institutions which can address human rights-related grievances. In 2008, out of 85 recognized NHRCs, 40 were able to handle grievances, of which 31 were accredited under the Paris Principles.¹²³

Company-based grievance mechanisms are often the only remedy accessible in rural and remote areas with mining. Recognizing this, in recent years the mining industry has developed guidelines for mining companies on handling grievances.¹²⁴ In practice, there is greater availability of company-based grievance mechanisms in the mining industry, but their effectiveness needs improvement.¹²⁵

In addition, financial institutions such as the IFC have also set up grievance mechanisms.

Taken together, however, grievance mechanisms in many countries are fragmented and may not provide an effective avenue for redress. The report of the United Nations Special Representative on Business and Human Rights sets out principles for designing grievance mechanisms.¹²⁶

FIGURE 6. THE UN “PROTECT, RESPECT AND REMEDY” FRAMEWORK FOR BUSINESS AND HUMAN RIGHTS



Source: Based on United Nations Human Rights Council 2008

120 United Nations Human Rights Council 2008.

121 French and Kirkham 2009.

122 Ibid.

123 United Nations Human Rights Council 2008.



5.5 Managing mine closure

Mine closure requires a special set of actions and processes in order to mitigate the negative impacts of mining on sustainable development. Although mine closure is the last phase in the life of a mine (See Section 3.4 on Mine closure phase), it requires planning and preparation from the very beginning of the mine life.

In practice, however, mine closure is often inadequate. Many of these cases are a legacy of a time of loose or non-existent environmental regulations when companies could close their mines without carrying out proper mine reclamation and land rehabilitation. In many cases, substandard mine closure occurs due to environmental incidents, social conflicts, or decline in market prices for minerals causing the mining company to temporarily close

the mine or sell it to another operator. As a result, some mining regions are peppered with orphaned and abandoned mines, with a lasting legacy on the environment and surrounding communities and a significant drain on public resources. For example, it is estimated that in Australia there are over 50,000 abandoned mines (as of 2012), in Canada, over 10,000 (as of 2000) and in South Africa, nearly 6,000 (as of 2009).^{127, 128, 129}

Mine closure involves shutting down mine operations, conducting mine site reclamation and rehabilitation, and handing over the mine site (relinquishing) to the relevant government authority.^{130, 131} Mine reclamation and rehabilitation are key parts of mine closure. Mine reclamation is the process of backfilling the void created by extraction, while mine rehabilitation is the process of revegetation and restoration of fauna on the site. While governments and communities often

Box 13 Good practices in mine rehabilitation

One of the good practices in rehabilitation of open-pit mines of coal and placer gold mining is progressive rehabilitation, where mining companies rehabilitate “as they go” – backfilling and revegetation as some mine areas are exhausted and mining works move to other areas. Progressive rehabilitation, as opposed to rehabilitation after the entire mine is mined out, is advantageous due to two reasons. First, progressive rehabilitation shortens the duration of time to stockpile the topsoil, thus reducing the loss of native seeds embedded in the topsoil and increasing the chances of success of revegetation.^{135, 136} Second, progressive rehabilitation allows spreading out costs more evenly over time and thus reduces the risk that rehabilitation may not be carried out at all, or might not be carried out adequately.

Another good practice is the determination of indicators of success of mine rehabilitation. These indicators typically include indicators of physical and chemical stability, as well as ecosystem indicators such as species composition, plant cover, degree of self-regeneration by plants, the extent of colonization by alien species of plants or animals, and the quality of run-off water.¹³⁷ Relinquishment of the mine site from the mining operator needs to be based on such objective and measurable criteria. To enable environmental regulators to assess the quality of land rehabilitation, the Commonwealth Scientific and Industrial Research Organization (CSIRO) of Australia has developed a monitoring tool which allows comparing the condition of the ecosystem in a rehabilitated site with that in similar sites.¹³⁸

¹²⁴ See for example, guidance on handling grievances by ICMM. International Council on Mining and Metals (ICMM) 2009.

¹²⁵ Kemp and Bond 2009.

¹²⁶ United Nations Human Rights Council 2008.

¹²⁷ Unger et al. 2012.

¹²⁸ Mackasey 2000.

¹²⁹ South Africa, Auditor General 2009.

¹³⁰ Australia, Government of. 2016b.

¹³¹ Cowan, Mackasey, and Robertson 2010.

¹³² Lamb, Erskine, and Fletcher 2015.

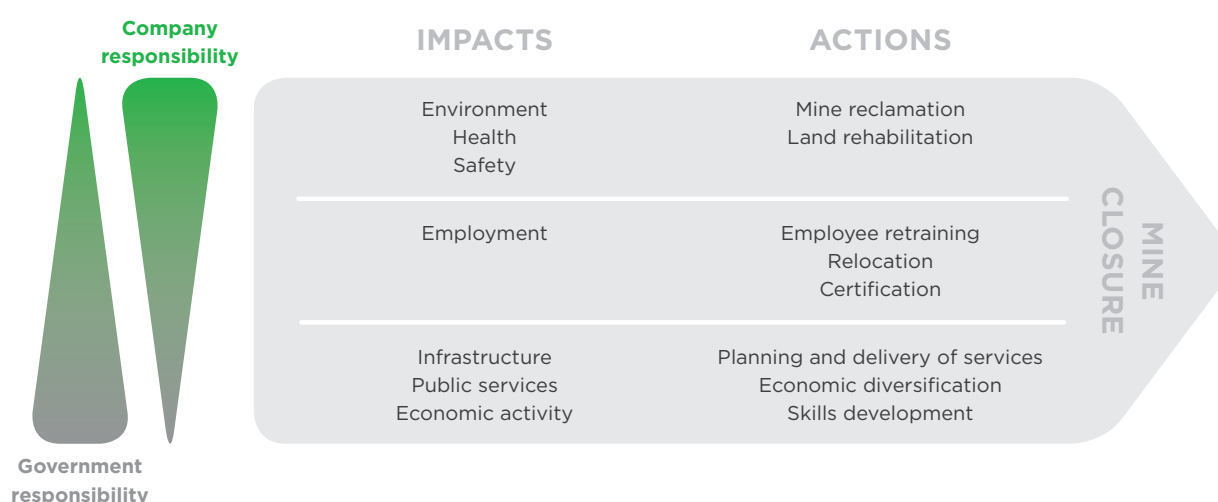
¹³³ Ibid.

expect mine sites to be restored to their original state, these expectations usually cannot be achieved on a sustained basis or in a cost-effective manner. For example, even if native biota (animal and plant life) and ecosystems are restored upon mine closure, their evolution on a disturbed site is not predictable and their sustainability cannot be guaranteed. For large open-pit mines, backfilling the void might not be feasible, as it might be prohibitively costly. It might not also make sense from an environmental point of view, since the amount of fuel and energy required, and emissions released from such an undertaking would outweigh the environmental benefits of closing the pit. Alternative, and perhaps more realistic, objectives of mine closure range from establishing stable landforms with functioning ecosystems and at least some of the native biota, or bringing the site to a point where it can be used for alternative uses and establishing non-native biota and ecosystems that are necessary for these uses.¹³² For instance, in Australia, several states require rehabilitation until a mine site is “safe, stable, non-polluting and enable[s] a sustainable new land use”.¹³³

The predominant concern in mine closure has traditionally been with environmental aspects of mining. Since mining often takes place in peripheral, less developed regions and locations, the socio-economic impact of mine closure can be dramatic for host communities. Therefore, mining companies and governments need to see, plan and manage mine closure in a more holistic way, which not only mitigates the environmental impacts, but also addresses socio-economic issues, such as the re-employment of mine workers and development of alternative economic activities in the area to prepare for mine closure. In recent years, the mining industry has paid increased attention to the socio-economic aspects of mine closure, such as planning for the unemployment of workers after mine closure, reduced work for local businesses, decline in government revenues and reduced use of infrastructure.¹³⁴

While mining companies have direct responsibility for addressing environmental, health and safety issues, governments are usually expected to assume more responsibility for addressing long-term socio-economic development issues beyond the life of a mine (See Figure 7).

FIGURE 7. A HOLISTIC APPROACH TO MINE CLOSURE



¹³⁴ International Institute for Environment and Development (IIED) and World Business Council for Sustainable Development (WBCSD) 2002.

Box 14 Biodiversity offsets

Unprecedented pressures on biodiversity by human activity and the loss of biodiversity are well documented.¹³⁹ The Business and Biodiversity Offsets Programme (BBOP), implemented through the collaboration of over 80 conservation organizations and individuals, has developed the mitigation hierarchy concept, which can be used as a tool for addressing biodiversity loss (See Figure 8). The mitigation hierarchy, recommended for regulators and project developers, envisages four sequential steps in ensuring no net loss of biodiversity: avoid impact on biodiversity, minimize impact, rehabilitate and restore biodiversity, and offset biodiversity by restoring it on a different site. A key idea of the mitigation hierarchy is that a project proponent should only consider the subsequent step if the earlier step is not possible.

Within the mitigation hierarchy, biodiversity offset is the “last resort” step. It is defined as “measurable conservation outcomes of actions designed to compensate for significant residual adverse biodiversity impacts arising from project development after appropriate prevention and mitigation measures have been taken”.¹⁴⁰ The mitigation hierarchy is particularly relevant for mining projects.

However, biodiversity offsets are considered controversial by some conservation organizations because they may allow regulators to give a “green light” to projects with severe impacts on biodiversity.¹⁴¹ They also appear to be less preferred when juxtaposed with rehabilitation of the mine site itself (in situ rehabilitation).¹⁴² Biodiversity offsets may also not be preferred from the social perspective, as they do not consider the issues of land tenure – who owns or uses which land. For instance, while land belonging to one community may be mined, the company may do an offset in another land which belongs to a different community. In the words of a Mongolian nomadic herder, “What’s the use for me when the [mining] company takes away my shirt [my pasture] and gives an extra shirt to a herder in the next valley?”¹⁴³

FIGURE 8. MITIGATION HIERARCHY



135 Ibid.

136 Topsoil is critical for rehabilitation as it contains mineral resources and seeds. Therefore, to achieve good rehabilitation, mining companies should remove the topsoil separately from the rock beneath and conserve (stockpile) it; after reclamation (backfilling) of mine voids, they put the topsoil cover back, upon which they grow vegetation.

137 Wortley, Hero, and Howes 2013.

138 Australia, Government of. 2016b.

139 Secretariat on the Convention of Biological Diversity 2001.

140 Business and Biodiversity Offsets Programme: http://bbop.forest-trends.org/pages/biodiversity_offsets. Accessed 9 November 2017.

141 Ibid.

142 Burton, Shegufa and White 2012.

143 Personal communication with D. Sukhgerel, Oyu Tolgoi Watch NGO, Mongolia, November 2015.

5.5.1 Mine closure in the life of a mine

For mine closure to be adequate, mining companies plan and prepare for it from the very beginning of the life of a mine; mine closure is an ongoing process that is planned for and implemented during the exploration phase, the mine development phase, the operation phase, and the actual mine closure phase with post-closure monitoring also required (See Figure 9).

At the exploration phase, companies gather preliminary baseline data and discuss with communities about their expectations and possible options for land use after the mine closure. A preliminary closure plan is made.

At the mine development phase, mine planning and design is done considering environmental and social considerations to minimize the negative impacts after the mine closure. Mine construction should be done considering future land uses and to maximize the potential for mine reclamation and rehabilitation. During this phase, regulators require mining companies to submit mine closure plans as part of the Environmental Management Plan, which

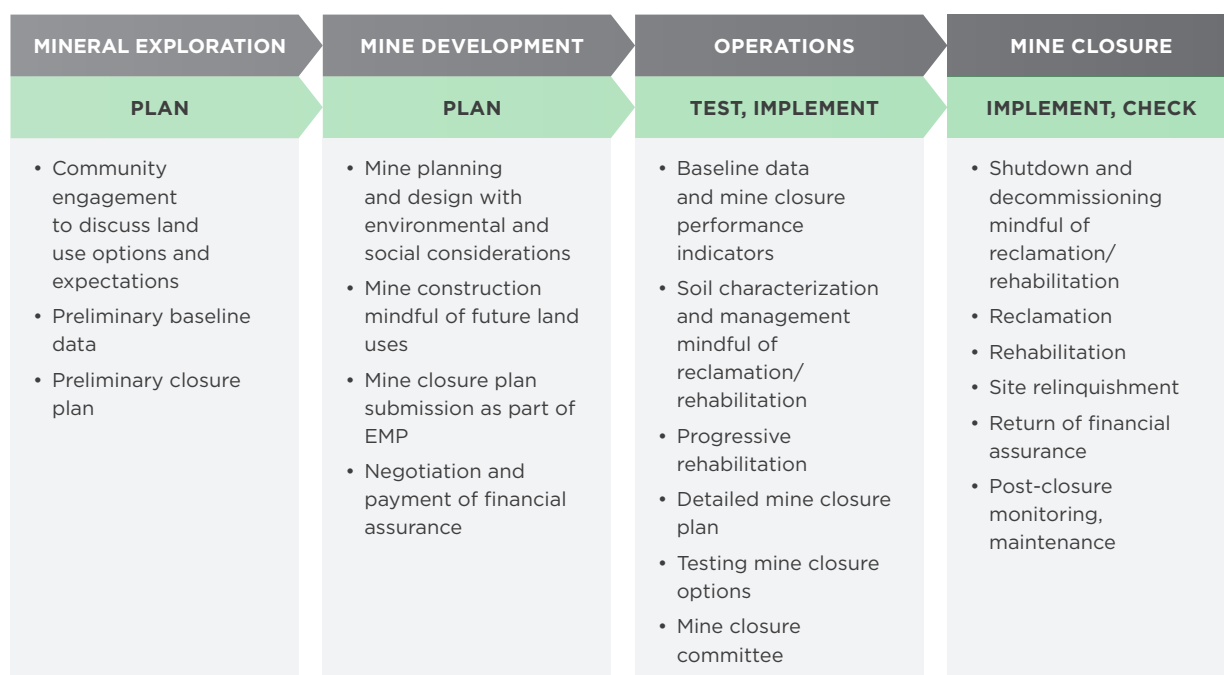
articulates the end goal of rehabilitation, and to pay financial assurance to finance the mine closure (See below in Section 5.5.2 on Financing mine closure).

At the operation phase, companies develop detailed mine closure plans on the basis of detailed baseline data, and already start implementing mine closure steps, such as soil management and placement in an optimal way that is conducive to mine reclamation. Where possible, they should conduct progressive reclamation and rehabilitation. Since reclamation and rehabilitation vary from site to site, mining companies also try out options in a small area to see what methods suit best. A good practice is establishing a tripartite mine closure committee composed of company, government and local community representatives.

At the actual mine closure phase, mine reclamation and rehabilitation are carried out. Upon satisfactory reclamation and rehabilitation, the mine site is relinquished, or handed over to a relevant government authority and the mine closure financial assurance is returned.

Post-closure monitoring is also required to ensure that the biota and ecosystems evolve sustainably. Particularly if there is Acid Mine Drainage (AMD),

FIGURE 9. MINE CLOSURE PROCESS THROUGHOUT THE LIFE OF A MINE





the mine site would require care and maintenance in perpetuity. The impacts of AMD are long term, spanning several generations. This means that accountability and responsibility for managing the long-term effects of AMD should be clarified and assigned well in advance of mine closure.

Community engagement is important throughout all the phases of a mining project and should be done regardless of whether community members have legal, statutory rights over the land where the mine site is located.

5.5.2 Financing mine closure

Mining companies incur major costs at mine closure phase, at a time when financial inflows from the mine dry up. This is the main reason why many mining companies abandon mines or do not conduct mine reclamation and rehabilitation adequately, particularly in countries with weak environmental regulation. Moreover, most mines close for reasons other than the depletion of the mineral deposit: economic, financial, social and political reasons. A study of 1,000 closed mines shows that only 25 percent closed upon exhausting the mineral deposit.¹⁴⁴ The costs for the public can be staggering. For instance, in Queensland, Australia, the cost of rehabilitating 15,000 abandoned mines in that state alone is estimated at AU\$1 billion.¹⁴⁵

To reduce the risk of mine abandonment, most governments nowadays require environmental financial assurance (EFA) from mining companies, a deposit payment before commencing mining operations which would be used for mine reclamation and rehabilitation should the company default on its obligations. Environmental financial assurance goes by different names in different jurisdictions, such as 'environmental bond', 'surety', or 'guarantee'. According to surveys of large mining companies conducted by ICM, between 1998 and 2004, a number of jurisdictions have strengthened their

legislation on mine closure during this period, namely, Botswana, Canada (Yukon), Chile, Ghana, India, Peru, South Africa, Sweden and the United States.¹⁴⁶

The amount of EFA should be determined on the basis of the mine closure plan, specifically based on scientific and engineering considerations, rather than negotiations. The amount is then regularly updated as the mine progresses and the mine closure plan becomes more and more clearly defined.¹⁴⁷ In practice, some jurisdictions set EFA amounts significantly lower than costs needed for reclamation and rehabilitation (Ghana, South Africa and Quebec, Canada), while others set them significantly higher than deemed necessary (New South Wales, Australia; Ontario, Canada; Nevada, USA).¹⁴⁸ In Australia, the government of the state of New South Wales commissioned a tool to estimate rehabilitation costs, on the basis of which the amount of EFA can be determined.¹⁴⁹ Arguably, the tool enables the government to arrive at estimates that are more objective, and less dependent on mining companies' estimates. In Western Australia, the government recently renewed regulations to pool mining operators in the same area and create a common fund for funding the rehabilitation of abandoned mines.¹⁵⁰

EFAs should not be used for purposes other than mine closure. To ensure that an EFA is used for the purpose intended, the EFA should be treated separately from other revenue flows to the government and kept in separate accounts. Countries require different forms of EFA instruments, such as cash deposits into a separate account of the government treasury or in a separate bank account. In addition, there are more sophisticated forms of EFA, such as surety bonds, insurance policies, letters of credit, deeds and certificates of self-guarantee, but they are less secure and should only be used with major, creditworthy mining companies; they also require greater capacity from the government authority to ensure that the issuer of mine closure guarantee is creditworthy.¹⁵¹

144 Lèbre and Corder 2015.

145 Queensland Audit Office, Australia 2013.

146 Miller 2005.

147 Nikiema 2015.

148 Miller 2005.

149 Australia, Government of. 2016b.

150 Dalaibuyan et al. 2016.

151 Ibid.

RECOMMENDATIONS

Protecting the environment and people

Designing environmental regulation that adequately protects the environment, which also establishes clear rules for investors

Where capacities of the government and the mining industry allow, considering adoption of more innovative approaches to environmental regulation, such as performance-based regulation and economic incentives

Making requirements for EIA and EMP for the mining industry, setting out clear roles for the government, mining companies, environmental services experts, civil society organizations and community groups

Establishing laws and regulations for mine closure that prevent large environmental legacies and public costs

Ensuring that affected communities are informed in advance of mining projects about land use options which are available after mine closure

Investing in capacities of regulators for monitoring and enforcement of regulations

Improving intra-governmental coordination mechanisms, such as those between mining and environmental ministries, local governments, human rights commissions and other government agencies

Enhancing access to mining-related information that is important and relevant to local communities

Fostering a culture of transparency in the government and in the mining industry

Opening legal avenues for local communities and indigenous peoples affected by mining to have a say in mining projects; defining minimum standards for adequate consultation and consent; investing in the capacities of communities affected by mining; and providing access to remedy for people affected by mining.





Realizing and enhancing the benefits from mining

In the mining sector, governments typically take **40 to 60 percent of rents** (profits) in taxes, royalties and fees

Between 40 and 80 percent of extractive companies' revenues is spent on procuring goods and services

In Chile, Ghana and the United States, mining was responsible for creating **4 to 28 additional jobs** in other sectors

6



The mining sector can bring significant economic benefits to a country by generating fiscal revenues and export earnings, relieving constraints to investment, spurring economic growth and creating jobs, as well as contributing to building physical infrastructure.¹⁵² Local communities that live near mine sites can also gain economic benefits from mining. However, realizing and enhancing these benefits require actions, primarily from the government, but also from mining companies, local communities, employers and businesses in the country.

6.1 Fiscal revenues

Flows of fiscal revenues from the extractive industry – taxes, royalties and other payments – are one of the major reasons why governments seek to promote the growth of this industry in their countries. Revenues from the extractive industry, particularly oil and gas, can account for a large proportion of fiscal revenues in resource-dependent countries. In 2011, during the peak period of mineral prices, mining accounted for 34 percent of total fiscal revenues in Botswana, 25 percent in Guinea and Zambia, 24 percent in Mongolia and 17 percent in Chile.¹⁵³ The extractive industry gives impetus to other economic sectors, such as infrastructure, construction and some service sectors, which can further magnify the impact of mining on economic growth and fiscal revenues.

However, benefits from revenues earned in the mining or other resource sectors do not flow in automatically. To translate fiscal revenues from the extractive industry into sustainable development benefits, at least four steps are needed:

1. Mining companies need to earn profits (or rents)¹⁵⁴
2. Governments need to collect fiscal revenues from mining companies
3. Governments need to manage these revenues

4. Governments need to spend or invest these funds for sustainable development

6.1.1 Earning profits from mining

An obvious but sometimes overlooked point is that in order for a government to collect taxes and payments from the mining industry, mining companies in its territory need to earn profits, or at least have prospects to earn profits in the future.

Profits of mining companies are driven by several key factors. First, the geological features of the mineral deposits define the profitability of mining this deposit. For instance, if the mineral deposit lies deep in the earth, the cost of mining it will be much higher compared to a shallow deposit. If the deposit grade is high (the concentration of the valuable mineral within the earth is high), then its cost per unit of mineral will be lower. The size or scale of the deposit is another major factor in determining profitability.

Second, technologies used by the mining company are also important for determining its profitability. More environmentally friendly technologies might be costlier in terms of capital and operational expenditures. However, these technologies can also be more efficient (although this is not always the case), thereby bringing more revenues and having lower environmental clean-up and liability costs for the company.

Third, the markets for mineral and metal commodities are highly cyclical – subject to large fluctuations in prices. Since getting a mineral deposit ready to be mined (the mine development phase) can take several years, the mining industry is globally prone to periods of undersupply and oversupply of minerals and metals, which translates into these price fluctuations. These fluctuations

¹⁵² Much of this section is relevant not only for mining, but also for the oil and gas sectors. Collectively, mining, oil and gas industries are referred to as “extractive industries”. This section will use the terms “extractive industry” and “resource sector” interchangeably.

¹⁵³ IMF dataset on fiscal revenues from mining, oil and gas, 2000–2011. The database is an unofficial internal survey by the IMF and has not been verified by country authorities. For more information about the methodology for estimation of fiscal revenues from the extractive industry, see International Monetary Fund (IMF) 2012.

¹⁵⁴ In economics, a concept of rents is similar to, but not the same as profits. Rents are “excess profits” earned above “normal profits” that would have been earned in a competitive environment. However, for simplicity, the notions of profits and rents are used in this section interchangeably.

affect profits. For instance, a mining company which acquired a mining licence at the time of high mineral prices may only start producing when the mineral prices have declined. The fluctuations of the prices of most minerals are outside of the control of an individual mining company or the government of the host country.¹⁵⁵ In feasibility studies, companies make provisions for such market price fluctuations. However, delays in the mine development and operations processes which arise from conflicts, or the time needed for adequate consultation of local communities are difficult to foresee. They can result in delays in timing of the mine production and the profitability from the mine.

Although these factors are external – largely outside of control of governments, they are important for governments, since these factors should be considered in making decisions about taxes, managing resource revenues and investing them sustainably.

In addition to these external factors, there are also factors which can be influenced by governments that impact on company profitability. For instance, if the overall business environment is healthy, then the company incurs fewer costs and earns more profits. Transparency in the governance of the resource sector, such as ensuring the provision of information, licensing, contracting and environmental regulation, is important for a healthy business environment. Having a coherent legal and regulatory framework is also conducive to a healthy environment for doing business. Having an educated, trained and skilled local workforce is beneficial not only for the workforce, but also for mining companies, since in countries with skilled workers, companies can employ local workers and spend less on worker relocation. Having institutions and systems that protect human rights is also beneficial for mining companies in the long run,

since in such an environment there will be less risk of conflict and less conflict-related costs.

Thus, it is within the power of governments to create a business environment that is conducive for doing business in the extractive industry, which at the same time benefits their citizens and minimizes the impact on the environment.

6.1.2 Getting fiscal revenues from mining

The subsequent step towards realization of fiscal benefits from the extractive industry is to capture a portion of extractive industry profits¹⁵⁶ through taxes, royalties and other tax-like instruments.¹⁵⁷ This portion is called the government “take”,¹⁵⁸ as opposed to the company “take”, which is the portion that is retained by extractive companies.

The objective of governments of resource-endowed countries is usually to have a fiscal regime that is attractive to investors and, at the same time, ensures a fair share to the government.¹⁵⁹ Analysis conducted by the IMF shows that in practice, the government “take” (or the average effective tax rate) has been approximately 40 to 60 percent of mining sector rents;¹⁶⁰ if it is significantly lower than this benchmark, it is a cause of concern that the government is not getting its fair share from mining. At the time of increasing mineral prices during the recent mining boom, many resource-rich countries found their share of the “take” declining, whereas corporate profits were rising disproportionately.¹⁶¹ As a result, countries started revising their fiscal regimes in order to capture a bigger share of resource rents – between 2002 and 2012, at least 22 countries reviewed their natural resource fiscal regimes.¹⁶²

155 However, if a country holds large enough reserves of a specific mineral, it can be a price-setter – influencing prices by controlling the production of this mineral. In addition, some large mining corporations are sufficiently big to control non-trivial amounts of mineral and metals production, and can influence the prices of these minerals and metals. The clearest historical example is the concentration of diamond production in the hands of one company, De Beers, which allowed it to be a price-setter for diamonds for most of the 20th century.

156 Technically, royalties, as well as many taxes and fees on mining companies, are not imposed on profits. However, the overall idea here is that taxes and tax-like payments to the government “take away” from the company’s profits.

157 In this section, all these tax-like instruments are referred to as “taxes” and “taxation” for simplicity.

158 The “government take” includes not only taxes, but also other tax-like instruments such as royalties (which are technically not taxes), signature bonuses, fees, and dividends on government shares in a resource company, as well as part of the in-kind take of the government (which is common in the oil and gas industry).

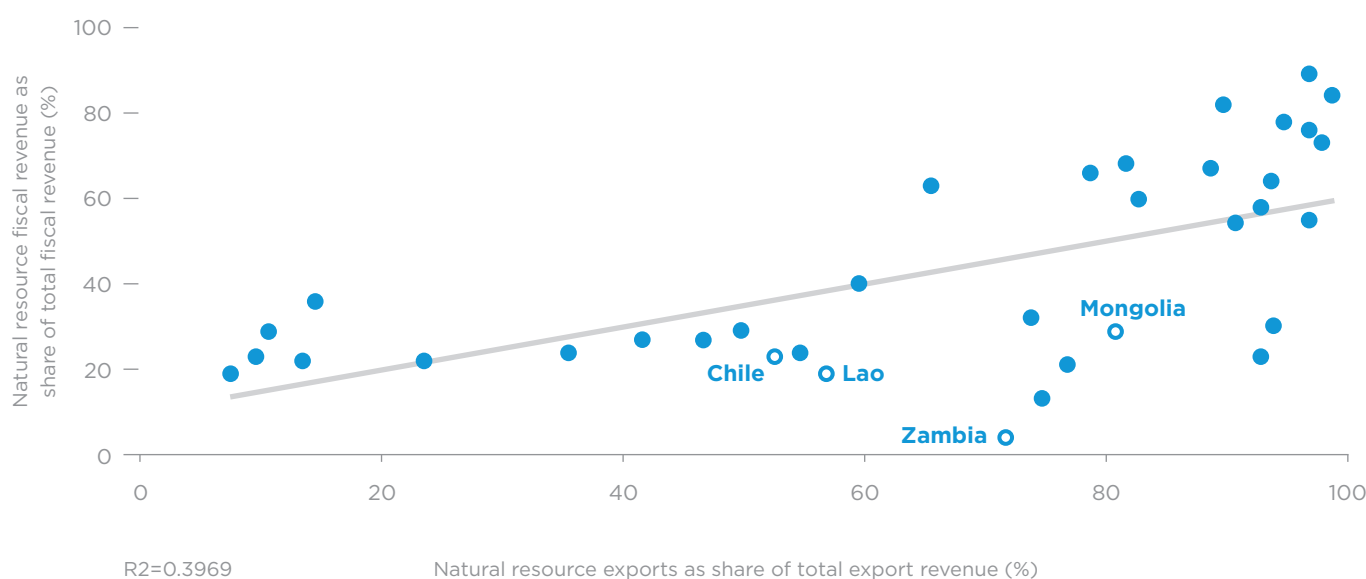
159 International Monetary Fund 2014b.

In comparing a natural resource fiscal regime of one country with that of another country, simply comparing tax rates does not help because of differences in how tax bases are defined and many other factors that determine the effective tax rate paid by mining companies. There are alternative methods for estimating the government “take”, or estimating how fiscal revenues from the extractive sector compare with those of other countries.

The simplest method is comparing fiscal revenues collected from the resource sector (as a share of GDP) with that of other countries with comparable resource sectors (measured, for example, as a share of the mining sector in GDP or exports). Figure 10 illustrates such a comparison: countries depicted

close to the upward-sloping line have fiscal regimes that are in line with an international benchmark; those significantly above it get a greater government “take” relative to the size of their extractive sectors, while those significantly below it get a lower government “take”. In 2006–2010, Zambia, one of the countries heavily dependent on mining (minerals accounted for over 70 percent of its exports), got less than 5 percent of its fiscal revenues from natural resources, while during the same period, Mongolia with a comparable share of minerals in its exports, got 30 percent of fiscal revenues from mining (See Figure 10).¹⁶³ So clearly, Zambia taxed its resource sector much less than other countries with comparable resource sectors.¹⁶⁴

FIGURE 10. FISCAL REVENUES AND EXPORT EARNINGS FROM EXTRACTIVE SECTORS IN RESOURCE-RICH DEVELOPING COUNTRIES, AVERAGE 2006–2010¹⁶⁵



Source: Simpasa et al. 2013

¹⁵⁹ Compared to the mining sector, the government “take” (the average effective tax rate) in the petroleum sector is higher. The same analysis shows that the government “take” accounts for 65 to 85 percent of petroleum sector rents. International Monetary Fund 2012.

¹⁶⁰ Sachs et al. 2013.

¹⁶² Ibid.

¹⁶³ Simpasa et al. 2013.

¹⁶⁴ Subsequently, Zambia overhauled its mining regime, replacing mining contracts with a law-based regime. It also raised royalties from 3 to 6 percent. For a detailed discussion, see Sachs et al. 2013. By 2014, the share of mining revenues in the budget increased to 32 percent before declining to 26 percent in 2015 (EITI Secretariat 2016b).

¹⁶⁵ Simpasa et al. 2013.

However, this method provides only a crude estimate. It does not allow distinguishing between mining, oil and gas; between different types of minerals, or between specific mining projects. It is also only suitable for comparing countries that predominantly export their minerals.

Another method is to model taxes and payments paid to the government at the project level by constructing a project-level mining fiscal model. This method is much more precise than the above method, as it allows estimating the Average Effective Tax Rate (AETR), which is a measure of the government “take”, based on detailed project-level data. The model uses Microsoft Excel or other spreadsheet software, and is based on a discounted cash-flow analysis tool used by investors in estimating the rate of return, net present value of investment and other financial parameters of a project before investing in it. The first study, which applied this methodology at scale in the mining sector to enable the comparison of fiscal regimes, was done in 1997 and updated in 2000.¹⁶⁶ The study compared fiscal regimes in gold and copper mining in about 20 countries by applying fiscal regimes to the same hypothetical but realistic mine data and found that, for instance, Chile, the Philippines and South Africa had some of the lowest effective tax rates for gold and copper mining in 2000, while Canada (Ontario), China, Papua New Guinea, Poland and Uzbekistan had some of the highest.¹⁶⁷

The IMF, improving on this method, has developed the Fiscal Analysis of Resource Industries (FARI) tool.¹⁶⁸ The tool is developed with variations for the mining and petroleum sectors. The main indicators of interest to governments from the tool are the Average Effective Tax Rate (AETR), the Marginal Effective Tax Rate (METR) and the progressivity of the fiscal regimes (a measure of the extent to which the effective tax rate becomes higher as the profitability of the project becomes higher).

Project-level fiscal models, such as FARI, have several uses. When applied to specific resource projects, the tool allows governments an

independent model for estimating the profitability or “take” of the company, and the government “take”, which is important for negotiating taxes and other payments with large mining investors. The model enables the adoption of a long-term perspective on the fiscal regime, considering fiscal revenue flows over the whole life of a mining project (or oil and gas project).¹⁶⁹ For instance, Figure 11 shows the flows of fiscal revenues from a hypothetical oil project (which has some similarities with a mining project) over the life of the project; fiscal revenues are small during the exploration and development phase, peak during the production phase and disappear during the closure phase.

The tool can also be used at a macro, or economy-wide level. When applied to several large resource projects, the tool allows assessing the overall government “take” of the existing fiscal regime and comparing it with that of other countries. Also, for countries with large resource sectors relative to their economies and where the resource sector is concentrated in a few large-scale projects, this tool can be used for forecasting fiscal revenues (See Box 15).

In principle, mining fiscal models should include the costs of environmental and social impact management. In recent years, more jurisdictions have started using Environmental Financial Assurance (EFA) in the mining sector, commonly referred to as environmental bonds (See Section 5.5.2 on Financing mine closure). While EFA is not a tax (it is a deposit held in trust by the government to be returned upon adequate mine reclamation and rehabilitation), it has financial implications, since a mining company may need to borrow at interest to make the EFA deposit. Similarly, insurance against environmental disasters is also becoming a common requirement for mining companies. These and other costs, such as environmental compliance costs, costs of consultations with local communities, costs of resettlement and social investments in communities’ development should also be included in mining fiscal models.

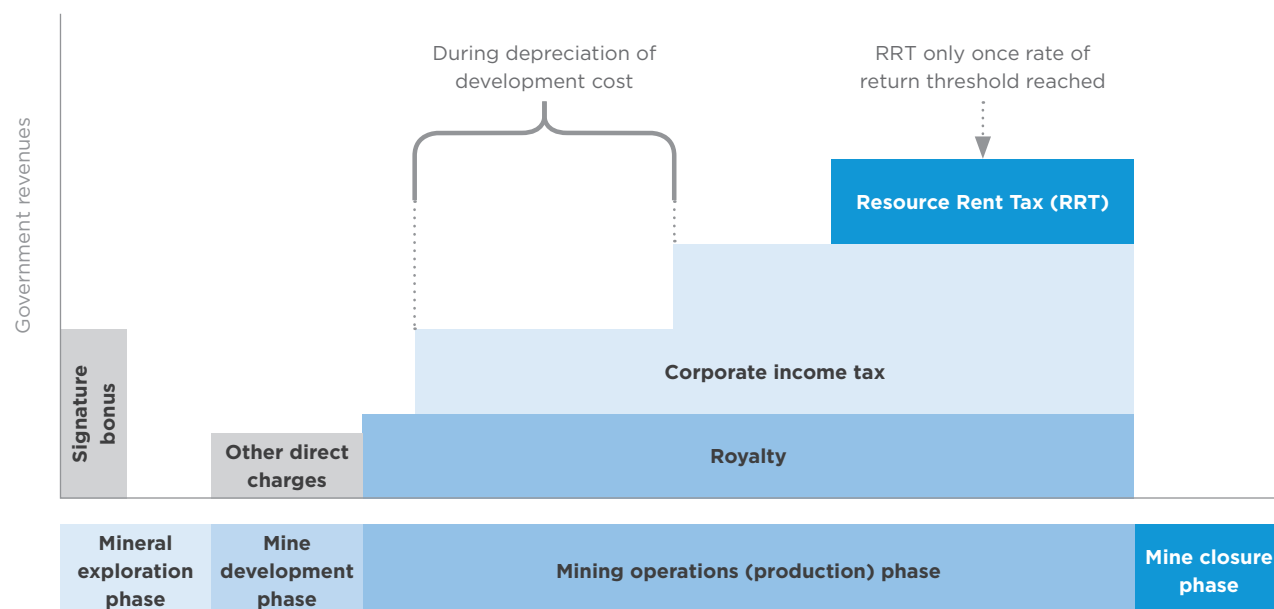
¹⁶⁶ Otto 2000.

¹⁶⁷ Ibid.

¹⁶⁸ Fiscal Analysis of Resource Industries, IMF website: <http://www.imf.org/external/np/fad/fari/>. Accessed 17 November 2017.

¹⁶⁹ Physical production volumes in mining are estimated by companies decades ahead in their feasibility studies, which allows using these data for the model. Such production estimates help make project-level models suitable for long-term projections.

FIGURE 11. A TYPICAL PROFILE OF FISCAL REVENUES FROM A RESOURCE PROJECT (PETROLEUM)



Source: Adapted from Luca and Puyo (2016)

Box 15 Mining fiscal models in practice

In 2015, the UNDP-UNEP Poverty Environment Initiative in Myanmar worked with the Myanmar Department of Mines to develop a financial model aggregating data from six major mining enterprises in the country. The model allows the government to gauge the extent of fiscal revenues to be collected from the mining sector.

In 2015, UNDP commissioned a study of foreign direct investment in the mining sector of Guyana for the Ministry of Natural Resources and the Environment.¹⁷⁰ Using a mining project-level fiscal model, the study estimated projected fiscal revenues from gold mining in 2015–2030, and found that under the existing fiscal regime, the government's revenues from the existing four large gold mines will peak in 2020 and rapidly decline thereafter. The study helped inform the government's long-term plans on foreign direct investment.

In 2017, NRGi worked with the government and mining companies in Mongolia to develop a macro-fiscal model to propose debt sustainability options to policymakers.¹⁷¹ A key component of the macro-fiscal model was a set of aggregated project-level models from the five largest mines in Mongolia (three copper mines, a gold mine and a coal mine), which allowed estimating the mining output and fiscal revenues from these mines for the next 30 years.¹⁷²

¹⁷⁰ Farooki and Mazumdar 2015.

¹⁷¹ Galindez et al. 2017.

¹⁷² Baksa, Mihalyi, and Romhanyi 2017.

Beyond the government “take” at a specific point in time, governments also consider the stability of their fiscal regimes, which is one of the priority factors for mining investors.¹⁷³ This is because mining is an industry with high upfront capital and operational costs and once these costs are incurred, the negotiating power shifts to the government. Changes to the fiscal regime after incurring the upfront costs can render the mining project unprofitable. Therefore, frequent, unforeseen changes to the fiscal regime are one of the main deterrents of investors. Due to such changes, investors seek to establish mine-specific contracts and to stabilize fiscal terms in these contracts for the duration of the mining project (See Section 4.2 on Mining contracts). To start with, governments should seek to ground their fiscal regimes in laws, rather than contracts.¹⁷⁴ The stability of a mining fiscal regimes helps governments to move towards a law-based regime.

However, having a stable fiscal regime does not mean being stuck with a fiscal regime that does not give the country its fair share of resource revenues. Case studies of five resource-rich countries that overhauled their legal and fiscal regimes in recent years show that for the most part, despite the threats by investors to leave the country, these reforms have done little to deter foreign investment in their resource sectors. In some of these cases, such as Tanzania and Zambia, the reforms represented a rebalancing from fiscal regimes with extremely low government “take” towards more internationally comparable regimes.¹⁷⁵ Ways of building flexibility into the mining fiscal regime include putting provisions in mining contracts to renegotiate terms within a specified period of time (recent known examples set the renegotiation period to five years), as well as adopting sliding-scale royalties which allow for automatic adjustment of royalty rates upon changes in mineral prices¹⁷⁶ (See Box 17).

Another key consideration for fiscal regimes in the resource sector is transparency. Since the early 2000s, several important international initiatives have been undertaken to increase transparency of the extractive industry (See Box 16). The lack of transparency can seriously undermine the country’s efforts to collect and subsequently to use revenues from resource sectors for sustainable development. Due to the large size of many resource projects, fiscal revenues from this sector are especially prone to corruption. Transparency also benefits investors, since the public is aware of fiscal revenues coming to the country from the sector and is less likely to contest mining or other resource projects.

Ensuring transparency also means having a relatively straightforward fiscal regime. In countries with very complex fiscal regimes, even if disclosure of information is practised, information on taxes and payments is difficult to understand and, therefore, becomes inaccessible.

173 Commonwealth Secretariat and International Council on Mining and Metals (ICMM) 2009.

174 Otto 2000.

175 Ibid.

176 Ibid.

177 EITI Secretariat 2016a.

178 See a report about PWYP’s progress till 2007. Van Oranje and Parham 2009.

179 International Monetary Fund (IMF) 2016. Part IV of the code on resource revenue management is currently being updated (IMF 2014a).

180 PricewaterhouseCoopers (PWC) 2012.

181 European Commission website, http://europa.eu/rapid/press-release_MEMO-13-540_en.htm. Accessed 9 October 2017.

Box 16 Transparency initiatives in the extractive industry

The **Extractive Industry Transparency Initiative (EITI)** is a multi-stakeholder initiative launched in 2002 with the backing of the UK government. The EITI sets standards to improve the governance of mining, oil and gas. Currently, it is funded by 16 supporting countries (developed countries) and a number of companies in the extractive industry. To implement the EITI standard, a country needs to apply to EITI. To meet the standard, the country needs to publish revenues received by all government agencies from the extractive sector; extractive companies in that country need to publish all payments made to the government; then, these amounts are reconciled and made publicly available. A key element is that EITI – both at the global and country levels – is overseen by a multi-stakeholder board which ensures independence of its activities. The EITI also ensures regular independent validation of the governance and reconciliation processes in each country. The EITI has become widely recognized and is now considered an important consideration for mining, oil and gas investors to invest in a country. With the adoption of the revised EITI standard in 2016,¹⁷⁷ EITI implementing countries (of which there were 52 at the time of writing) are assessed and categorized as countries with satisfactory progress, meaningful progress, inadequate progress or suspended. For more information, see: <http://eiti.org>

Publish What You Pay (PWYP) is a global coalition of over 800 civil society organizations which advocates for transparency and accountability in the extractive sector, established in 2002. Its core campaign message, oriented towards citizens and policymakers of developed countries, is that “the citizens of countries that are rich in natural resources should not be poor.” PWYP has been very successful in getting decision makers from developed countries to recognize the importance of transparency and accountability in the resource sector and take actions toward it. EITI was one of the results of PWYP’s campaign. PWYP also builds the capacity of civil society organizations in resource-rich developing countries.¹⁷⁸ For more information, see <http://www.publishwhatyoupay.org/>

Resource Contracts is a publicly available database of contracts in mining, oil and gas, created and supported by the Columbia Center for Sustainable Investment (CCSI), the World Bank and the Natural Resource Governance Institute (NRGI). Given the importance of contracts in the mining and other resource sectors in shaping the fiscal regimes, public disclosure of contracts is critical for transparency of fiscal revenues from the resource sectors. In addition, the database is useful for governments in negotiations for investors, since it enables them to draw on a large number of contracts available publicly. In doing this, it addresses the asymmetry of information between governments of resource-rich countries and investors. For more information, see <http://resourcecontracts.org/>

The IMF released the draft **Natural Resource Fiscal Transparency Code** in 2016,¹⁷⁹ which addresses issues of the clarity of roles and responsibilities, open budget processes, public availability of information, and assurances of integrity. The code goes beyond transparency in reporting and includes recommendations on the features of the legal, contractual and fiscal regimes that are important for transparency.

The **US Dodd-Frank Act**¹⁸⁰ (Dodd-Frank Wall Street Reform and Consumer Protection Act, 2010) includes provisions that require companies in the extractive industry that are publicly listed in the United States to disclose all “material” payments made to the US and foreign governments.

The new **EU Accounting and Transparency Directives** which were adopted in 2013, require companies in the logging and extractive industries, which are publicly listed in the European Union or large unlisted companies domiciled in the EU, to disclose payments made to governments.¹⁸¹

The Dodd-Frank Act and the Accounting and Transparency Directives complement the EITI by legally requiring extractive companies based in the United States and the European Union to publish their payments to governments. Since many multinational companies are domiciled in these jurisdictions, these acts have far-reaching implications for improving transparency in fiscal revenues in the extractive sector.

Box 17 Main taxes and payments paid by mining companies to governments

Corporate income taxes are one of the largest sources of fiscal revenues from mining in most countries. The tax base is the taxable income defined by the difference between total revenues and deductible costs of the mining company.

Key considerations include: 1) methods of calculating depreciation of assets (accelerated versus simple); 2) loss carry-forward provisions (which allow investors to deduct, up to a certain number of years, losses incurred in prior years as costs in the present year); 3) limiting the deductible interest expenses on loans; and 4) ring fencing of revenues and deductible costs for each mining project (which limits the possibility of mining companies moving costs between different mines to minimize payable taxes).¹⁸²

Other important considerations that arise with regard to multinational companies are the issues of transfer pricing and double tax treaties. Host countries can be subject to an abusive transfer pricing practice – a practice whereby a multinational company misstates prices to shift the source of profits to jurisdictions with lower tax rates.¹⁸³ Transfer pricing disadvantages jurisdictions with higher income tax rates. Double tax treaties, as well as strategies of investors to minimize their taxes, can erode the tax base of the host country.¹⁸⁴

Royalties are one of the largest revenue sources from mining in many countries. Royalties are specific to resource sectors and are imposed on the volume of mineral production (unit royalties) or the value (ad valorem royalties). Royalties can also be profit-based. Some countries use uniform rates of royalties for all minerals; others set different rates for different types of minerals; in less common cases, royalty rates are set not in the law, but on a project-by-project basis (for instance, investors propose rates when bidding for mining permits). In recent years, several countries have moved to sliding-scale ad valorem royalties, whereby a higher value of mineral production is taxed at a higher rate.¹⁸⁵ Sliding scale royalties represent a progressive fiscal regime.

One of the implications of royalties is that they raise the cost of production; therefore, companies paying higher royalties would mine deposits with higher grade (content of the mineral). This means that some of the deposit with lower grades is left in the ground, which represents inefficient use of natural resources.¹⁸⁶

Some jurisdictions require mining and other resource companies to pay additional royalties directly to indigenous peoples. For example, the Philippines requires payment of at least one percent of the value of the resource to indigenous peoples.¹⁸⁷

Resource rent taxes are used less commonly in the mining sector; they are more common in the oil sector. They are similar to corporate income taxes, but are applied on cash flows.

Customs duties include import taxes and export taxes. The import tax bill of mining companies can be significant due to the high value of mining equipment that is typically imported to resource-rich developing countries. Some countries also impose export taxes on raw minerals to incentivize further value addition (mineral processing) in the country.

VAT, with regard to the mining industry, is mostly derived from VAT on imports of equipment and services, as well as on exports of minerals.

¹⁸² Otto 2000.

¹⁸³ Daniel, Keen, and McPherson 2010.

¹⁸⁴ Ibid.

¹⁸⁵ Sachs et al. 2013.

¹⁸⁶ Otto 2000.

¹⁸⁷ Bauer et al. 2016.



Withholding taxes include taxes on dividends, on foreign interest service and on foreign services. Withholding taxes on dividends can be lowered or eliminated by a host country for investors from countries with which it has bilateral investment or tax treaties. Withholding taxes on foreign interest services are applied to encourage local lending to mining projects; and those on foreign services are applied to incentivize mining companies to buy local services (See more on local content in Section 6.2.3 on Strategies to increase employment and growth through mining).

Signature bonuses are paid upon signing a mining contract or when the contract becomes effective. They usually constitute single, lump-sum payments.

Licence/permit fees are payable upon granting of a mineral exploration or mineral extraction licence or permit.

Government equity participation is technically not a tax, but in many cases represents a payment from a mining company to the government. Resource-rich developing countries can gain equity participation in a mining project/company through several means: 1) by paid-up capital, like any other investor; 2) by borrowing the amount from the private investor (with or without interest) and later repaying it from royalties and taxes payable to the government; 3) by giving up some future taxes; 4) by making in-kind contributions, such as infrastructure provision; 5) by receiving free equity share. However, government equity participation is accompanied by several challenges, including carrying risk as a shareholder; not being able to realize anticipated learning and technology transfer; not being able to influence the company's decisions; or having to give up some future tax revenues.¹⁸⁸

Natural resource fees, such as fees for the use of land and water, are also imposed on mining companies.

Environmental compliance costs are not taxes, but constitute costs for the mining company.¹⁸⁹ From the taxation point of view, they may be deductible from taxable income (up to a certain amount). In addition, mining companies also use environmental insurance to cover their potential environmental liabilities.

Environmental Financial Assurance (EFA, also commonly referred to as environmental bonds) is now increasingly required by jurisdictions to cover the cost of mine closure (See Section 5.5.2 on Financing mine closure).

Local development costs constitute spending by mining companies on community development, such as social and infrastructure spending. Similar to environmental compliance costs, these are not taxes. However, in recent years, mining companies are increasingly expected by communities and governments to make contributions towards local development initiatives (See Section 6.3.2 on Community development initiatives). Some jurisdictions allow local development or social investment costs to be deducted from taxable income (up to a certain amount), which incentivizes mining companies to invest in local development, but reduces the taxable income of companies.

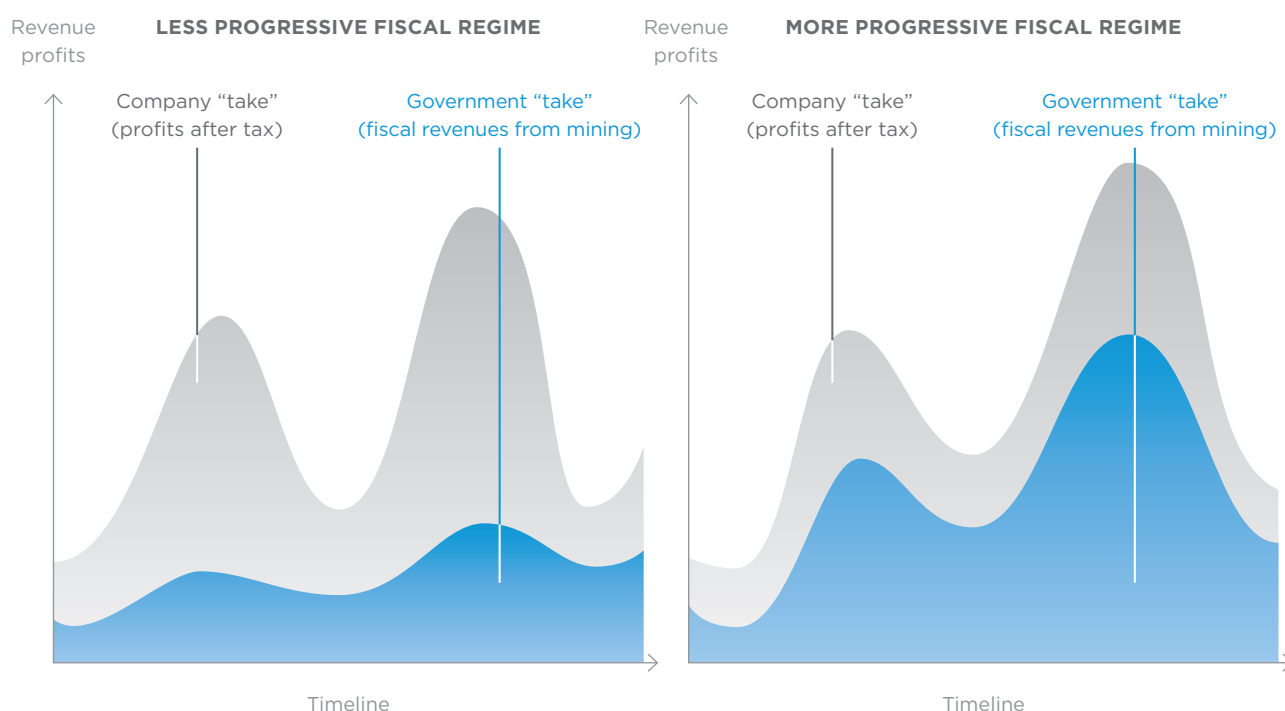
Moreover, some countries have instituted mandatory charges on extractive sector companies. For instance, Kyrgyzstan introduced a surcharge on royalties towards “payment for development and maintenance of local infrastructure” to be paid to local governments.¹⁹⁰ Such charges are in principle not very different from royalties.

¹⁸⁸ Revenue Watch Institute-Natural Resource Charter (RWI-NRC) et al. 2014.

¹⁸⁹ Otto 2000.

¹⁹⁰ Bauer et al. 2016.

FIGURE 12. EFFECTS OF MORE AND LESS PROGRESSIVE MINING FISCAL REGIMES ON FISCAL REVENUES



6.1.3 Managing fiscal revenues from mining

A more progressive fiscal regime¹⁹¹ in mining enables the host country to get a bigger share of mining rents during mining booms. However, because mineral prices are highly variable and, consequently, mining rents or profits are very cyclical, a more progressive mining fiscal regime also means that the volatility of fiscal revenues will be greater (See Figure 12).

This volatility has a negative impact on economic growth and development. There are many examples when during resource booms, governments of

resource-rich countries spend “voraciously”, by spending over their means and borrowing against future resource revenues.^{192, 193} During an earlier oil price boom, Mexico “borrowed against expectations of increasing real oil prices after 1981 and suffered badly when these expectations turned out to be far off track”.¹⁹⁴ A recent example is Mongolia, a country dependent on mining, which enjoyed double-digit economic growth during the peak of the recent mining boom. However, the government had expanded its expenditures unsustainably, so that the decline in mineral prices has hit its fiscal revenues. In 2016, the fiscal deficit reached an unprecedented 17 percent of GDP and in 2017, faced with the urgent need to repay its debt obligations, the country obtained emergency financing from the

191 A progressive mining fiscal regime – or a progressive fiscal regime, more generally – is one where higher rates are applied on higher profits.

192 Van der Ploeg and Poelhekke 2009.

193 Van der Ploeg 2011.

194 Gelb and Grassman 2010.



IMF.¹⁹⁵ In less dramatic cases of resource revenue mismanagement, there is still a tendency to spend without due consideration for a future possible decline in mineral prices.

The problems don't stop at the level of central government. During the recent mining boom, some governments of mineral-rich countries allocated more fiscal resources to subnational governments. Where not designed well, such allocation schemes can result in passing on the volatility of fiscal revenues from the national to the subnational level. For instance, a small municipality in Peru has seen its fiscal revenues increase 26 times in a single year, and revenues of a municipality in Colombia increased 100 times in a few years in the early 2010s. Much of these windfall revenues were invested in building 'white elephant' projects with limited use once the mining boom ended.¹⁹⁶

The volatility of mineral prices, particularly in countries where resource revenues account for a sizeable share of fiscal revenues, has adverse impacts on financing development expenditures – such as education, health, social assistance and infrastructure.

The main measures to manage the volatility of revenues are the adoption of structural budget rules, and setting up natural resource funds for stabilization and savings, accompanied by improved public financial management.

Structural budget rules developed by the IMF¹⁹⁷ entail splitting fiscal revenues into two parts – non-resource revenue and volatile resource revenue. The budgetary balance is also split into two parts – the structural budget balance which does not consider resource revenues and the non-structural budget balance which considers both resource and non-resource revenues. More importantly, structural budget rules require fiscal revenue projections that

are based on a long-term trend rather than short- to medium-term fluctuations,¹⁹⁸ so that they prevent overly optimistic budget expenditure plans.

Governments can also set up natural resource funds for stabilization and savings of fiscal revenues from their resource sectors.¹⁹⁹ When used for stabilization of fiscal revenues, governments save a portion of their revenues in natural resource funds during high mineral or oil prices, and draw them down during low prices.²⁰⁰ Natural resource funds are also used to save a part of resource revenues when the country does not have enough absorptive capacity to spend them, such as in Timor-Leste, or has not much need for public spending, such as in Norway.²⁰¹ Natural resource funds should be used in tandem with structural budget rules and are used to smooth public expenditures.

However, experiences of natural resource funds around the world are replete with cases of poor management and mismanagement due to technical and political problems. On the basis of reviewing experiences of natural resource funds, a comprehensive study by NRGi and CCSI provides recommendations on key rules for design and governance for managing such funds, such as setting clear objectives for the fund (whether it is savings, stabilization or other), establishing fiscal rules (how much fiscal revenues should be deposited in the fund and under what conditions can funds be withdrawn to the budget), and investment rules (what kinds of assets can funds be invested in, and what should be the risk/return mix of assets) as well as recommendations for the governance of the funds.²⁰²

Another important issue for the management of fiscal revenues from the resource sector is the system of natural resource revenue sharing between national and subnational governments.

195 International Monetary Fund (IMF) 2017.

196 Bauer et al. 2016.

197 Bornhorst et al. 2011.

198 Ibid.

199 Natural resource funds are a type of Sovereign Wealth Funds (SWFs) where funds come from the proceeds of natural resources, usually oil, gas and mining. In general, the magnitude of fiscal revenues from oil is greater than from mining. Therefore, natural resource funds are more common and are larger in oil-producing countries than in mineral-producing countries. (Bauer and Toledano 2014)

200 Bauer and Toledano 2014.

201 Ibid.

202 Ibid.

In most countries, major taxes and other payments by the extractive industry are paid to national (central) governments. National governments may then transfer a portion of natural resource revenues to subnational governments. Many resource-rich countries which implement such schemes redistribute natural resource revenues to subnational governments on the basis of derivation – to provinces where mining takes place, or from where revenues were derived from.²⁰³ In other countries, royalties and major taxes are paid directly to subnational governments. Direct payments to subnational (state) governments is often the case in countries with federal systems, such as Argentina, Australia, Canada, India, the United Arab Emirates and the United States, as well as China, which has a unitary system.²⁰⁴

Transferring natural resource revenues to mineral-producing provinces can help address existing or potential conflicts and compensate – to some extent – for environmental degradation and the resource depletion of these provinces. However, such transfers create perverse incentives (such as overspending during booms) and lead to complications in revenue management, as subnational governments may have less capacity than national governments to manage resource revenues. The design and implementation of such systems should consider general public fiscal management principles, as well as those specific to natural resource revenues.²⁰⁵

6.1.4 Investing fiscal revenues from mining

Since extraction of minerals or other non-renewable resources depletes national wealth, a key principle

is that revenues from resource extraction should be invested in building other forms of wealth or capital, rather than consumed (See Box 18). These forms of capital can include physical capital such as rail, road and energy infrastructure; human capital such as healthy, educated populations; and financial capital such as savings in the form of natural resource savings funds. The priorities of countries differ depending on their levels of development. In less developed countries with significant needs, it is justifiable to use more financing for spending on infrastructure, health and education, rather than saving the surplus in financial assets.^{206, 207}

Timor-Leste illustrates an example of trade-offs that are faced by resource-rich countries when questioning what to invest their natural resource revenues in. Timor-Leste is endowed with abundant oil reserves but has significant development needs, with 70 percent of the population deriving their livelihoods from agriculture.²⁰⁸ Timor-Leste established a Petroleum Fund in 2005 modeled after Norway's Government Pension Fund Global, envisaging a small percentage (3 percent) of the value of the Petroleum Fund to be used for public expenditures.²⁰⁹ However, within a few years it became apparent that the strategy should allow greater fiscal space to fund infrastructure and social service provision, for which the needs in Timor-Leste are immediate and are far greater than in Norway.

Resource-rich countries can also use proceeds from resource extraction to create other sources of growth, diversifying their economies away from the resource sector. Evidence shows that developing countries with a diversified economic base are better able to progress towards sustainable growth in the long run as they are more resilient to external shocks and are better able to mitigate vulnerabilities associated with globalization and

203 In fewer countries, national governments distribute natural resource revenues on the basis of indicators, such as population or level of development, which may be motivated by the principle of equalization between provinces.

204 Ibid.

205 For discussion and recommendations on the design and implementation of natural resource sharing systems, see Bauer et al. 2016.

206 For more discussion on strategies for investing fiscal revenues from natural resources, see Bauer and Toledano 2014. Particularly see pp. 47–58, “Fiscal Rules for Natural Resource Funds: How to Develop and Operationalize an Appropriate Rule”.

207 Hailu and Weeks 2012.

208 United Nations Development Programme (UNDP) 2017.

209 Natural Resource Governance Institute (NRGI) and Columbia Center on Sustainable Investment (CCSI) 2014.



Box 18 Weak and strong sustainability concepts

Environmental economists have sought to reconcile the tensions between the material needs of societies with the sustainable use of natural resources through the theoretical concepts of 'weak sustainability' and 'strong sustainability'. These concepts treat natural resources as a form of capital used in the production process along with capital and labour, in order to produce goods to satisfy people's material needs. Sustainability is achieved when the total stock of capital (total national wealth) increases or at least does not decline.

Proponents of the weak sustainability concept hold that natural capital can be substituted by manufactured capital or human capital (labour).²¹⁰ From here, it follows that, as long as physical, human or financial capital are created, depleting natural capital does not clash with sustainability. The weak sustainability concept has resonance in less developed, natural resource-rich countries, where the proceeds of extraction of mineral resources are invested in infrastructure, health and education – to increase the stock of physical or social capital.

However, the assumption that labour or capital can fully substitute for natural resources is unrealistic. Facing criticism for this assumption from environmental organizations and experts, economists came forward with the 'strong sustainability' concept – whereby natural capital is no longer considered replaceable, so the stock of natural capital should be maintained to satisfy conditions for sustainability.²¹¹ The strong sustainability concept implies policies that are focused on the greater protection of the environment and conservation of natural resources. Strong sustainability is less compatible with exploitation of non-renewable natural resources – which depletes these resources.

trade openness.^{212, 213} Policies for diversification can entail using resource revenues to promote the growth of non-resource sectors, such as through public investments in research and development, provision of subsidized credit, and investing in human resource capacity. However, there are not many examples of successful diversification of mineral and oil-dependent countries in the recent history. Among the few examples of countries which have achieved relative success are Chile and Malaysia. In Chile, the government invested in research and development of the agro-industry and fishing sectors, improved agricultural technologies, and invested in agro-processing ventures in the

1970s and 80s; these measures were complemented by actions by the industry and industry associations. As a result, the share of copper in total exports of Chile declined from half in 1980 to one a third in 1998, while agro-processing and farmed salmon sectors have emerged as major new export sectors.²¹⁴ Malaysia implemented policies to promote manufacturing and the exports of intermediate industrial goods in the 1970s, diversifying away from the reliance on exports of primary commodities.²¹⁵

210 Pearce and Atkinson 1993.

211 Gowdy 1999.

212 Gelb (2011) reports that a one standard deviation increase in the diversification of low-income countries' basket of exports is associated with an economic growth rate by 0.8 percentage points. Similarly, a one standard deviation increase in output diversification increased annual growth rate by 1.4 percentage points.

213 Developing countries that manage to diversify from agriculture into manufacturing and services experience lower volatility of inflation. See Koren and Tenreyro 2007.

214 Perez-Aleman 2005.

215 Japan International Cooperation Agency (JICA) and Japan Bank for International Cooperation (JBIC) 2008.

6.2 Employment and economic growth

In addition to fiscal revenues, another important benefit from mining for development is the creation of employment and business opportunities.

6.2.1 Employment in mining

The mining industry is capital-intensive and direct employment in mining is relatively small. However, a growing mining sector can increase employment significantly through the creation of indirect and induced jobs (See Box 19).

The number of indirect and induced jobs can be substantial. According to a review of available studies by the IFC, for every job created in the mining sector, the mining sector was responsible for creating more indirect or induced jobs in the economy (4 jobs in the United States, 6 jobs in Chile and 28 jobs in Ghana). Such indirect and induced job effects were much greater for the mining sector than other sectors such as hotels, retail or agriculture.²¹⁶

Similar with manufacturing, mining is a sector with rapid technological progress,²¹⁷ enabling people to learn and acquire skills. Skills that people learn and the productive capabilities of firms which depend on these skills are arguably the most important factors driving economic development. These skills – such as soft skills that are relevant across all sectors, or technical skills that can be useful for relevant occupations – can be transferred to other industries, spurring their development.

6.2.2 Economic growth through linkages with mining

Production linkages of the mining sector with other sectors can be more important to economic diversification and development than fiscal revenues.²¹⁸ Moreover, this contribution can be greater in monetary terms. It is estimated that 40 to 80 percent of extractive companies' revenues is spent on the procurement of goods and services.²¹⁹ Another estimate suggests that 50 to 65 percent of mining companies' spending is on employment, infrastructure and procurement, while only 15 to 20 percent is on taxes and other fiscal payments.²²⁰ Thus, even a relatively small shift of mining company expenditures from overseas to domestic suppliers (in the host country) can be larger, in monetary terms, than a large increase in tax payments.

216 International Finance Corporation (IFC) 2013, table 3.1, p. 29.

217 Although the recent trend towards greater automation in the mining industry is likely to reduce demand for low-skilled workers. (Cosbey et al. 2017)

218 Hirschman 1977, quoted in Morris, Kaplinsky, and Kaplan 2011b.

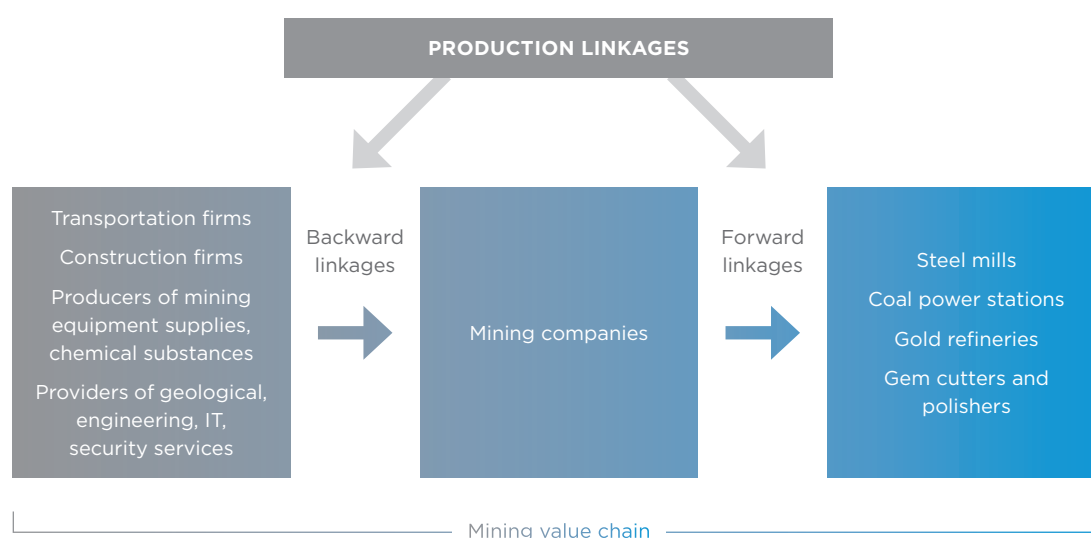
219 Dobbs et al. 2013, p. 13.

220 African Development Bank (AfDB) and Bill and Melinda Gates Foundation 2015, Figure 5, p.32.

Box 19 Production and consumption linkages of the mining sector with the economy²²¹

Mining is connected with the rest of the economy through *production linkages*, such as buying goods and services from firms, and supplying minerals to firms. In economics, linkages with firms which supply to the sector are called *backward linkages*, and linkages with firms which use the sector's goods as inputs are called *forward linkages* (See Figure 13).

FIGURE 13. PRODUCTION LINKAGES IN THE MINING VALUE CHAIN



Indirect employment²²² is created through jobs in firms with backward and forward linkages to mining – jobs that would not have been created in the absence of mining. These include, for example, jobs in firms providing geological, engineering and IT services to mining, some transportation and construction firms, and firms selling supplies to the mining industry. By strengthening backward and forward linkages, the positive impacts of mining on economic growth, development and employment can be enhanced.

Another link of mining to the economy is through *consumption* linkages. The growth of a resource sector raises economic growth and incomes generated through: 1) employment and wages in the resource sector, as well as sectors linked to it through backward and forward linkages; and 2) earnings accruing to owners of firms in the resource sector and sectors linked to it. Stronger consumption linkages of the resource sector mean that a bigger share of incomes is spent domestically, rather than on imported goods. The increase in domestic consumption raises demand for goods and services produced in the country, which translates into more jobs for people to produce these goods and services, which raises incomes further. Such employment is called *induced* employment (by the resource sector).²²³

²²¹ Morris, Kaplinsky, and Kaplan 2011b.

²²² International Finance Corporation (IFC) 2013.

²²³ Ibid.

6.2.3 Strategies to increase employment and growth through mining

To increase employment and strengthen backward linkages from mining to the rest of the economy, governments use two strategies. One strategy is to use local content requirements. The other strategy is to improve the competitiveness of local workers and businesses.

The first strategy – local content requirements – entails limiting the use of foreign employees and imported goods and services in the mining industry while giving preference to the use of local employees and locally produced goods and services. Local content requirements are implemented through policies such as quotas and taxes on the employment of foreign nationals, and provisions in mining contracts and laws on the minimum number of local employees, and the minimum percentage of goods and services to be bought from or produced in the host country.

Local content requirements can create a number of problems. They could lead to the loss of competitiveness of the mining industry; prop up suppliers and employees without corresponding improvement in skills and quality, which does not make them competitive; and promote corruption in both the government and the mining industry. This last risk is substantial given the magnitude of the amount of money involved in the procurement of goods and services by the mining industry.

An important consideration is that local content requirements go against the core idea of free trade and investment agreements. The WTO GATT (General Agreement on Tariffs and Trade), TRIMs (Trade-Related Investment Measures), GPA (Government Procurement Agreement), and SCM Agreement (Agreement on Subsidies and Countervailing Measures) contain articles and provisions prohibiting local content. However, local

content measures are allowed for a number of years upon first joining the GATT; moreover, Least Developed Countries (LDCs) are allowed to use local content measures. In recent years, Indonesia and Nigeria have used local content measures for the development of their oil and gas sectors;²²⁴ these and other measures can give rise to disputes under the above agreements. Nevertheless, local content requirements are common – as of 2013, more than 70 countries had in place some requirements for the extractive industry to buy goods and services locally.²²⁵

While local content policies may be needed to address market deficiencies, to be effective they should be complemented by the second strategy – measures to improve the competitiveness of local workers and companies to work in or to supply to the mining industry. These measures include creating a business-friendly environment, investments in basic infrastructure, improving access to credit and investing in education and skills.

This strategy to improve competitiveness is more sustainable since it is more conducive for developing sectors to diversify away from mining. With the trend of growing automation in the mining industry, raising the level of skills of workers might increasingly become a necessity, not an option. For example, it is estimated that further diffusion of automated technologies in the mining industry, which is already underway, will likely reduce the number of jobs in a typical mine by 30 to 75 percent.²²⁶ Demand for lower-skilled jobs such as truck drivers and drilling and blasting workers will decline, whereas demand for remote machinery operators will increase.²²⁷

Improving skills requires strong and proactive collaboration between the government, the mining industry and educational institutions. Policies and programmes to implement this strategy include training and education programmes, apprenticeship programmes, industry representatives teaching at educational institutions, skills certification programmes, providing public funding to students or educational institutions in professions needed

224 For more information, see here: https://www.wto.org/english/news_e/news15_e/monit_16apr15_e.htm

225 Ibid.

226 McNab et al. 2013, Accenture 2010, quoted in Cosbey et al. 2017.

227 Cosbey et al. 2017.



Box 20 Key questions for formulating local content policies

The World Bank conducted a study of local content requirements in the oil and gas industry around the world and developed recommendations for local content policies – which are broadly applicable to the mining sector as well.²²⁸ The following questions, based on the above study, can be useful in formulating local content policies:

- **Definition of “local goods and services”** – Are these goods and services supplied by companies registered in the host country or by companies owned by nationals? Are they limited to goods and services produced using local input and labour, or include imported goods and services?
- **Legal instruments used to set local content requirements** – Are local content requirements specified in mining laws, local content regulations or contracts?
- **Companies to which these requirements are applicable to** – Do these requirements apply only to mining companies, or also their contractors?²²⁹
- **Methods for preference for procurement of local goods and services** – Do local content requirements allow for a margin of preference to local goods and services suppliers, give extra points to local bidders, or set aside certain contracts open only to local suppliers?
- **Principles in requiring employment of local employees** – Do policies set quantifiable targets for employment in general, or disaggregate between high-skill and low-skill employment? Do they differentiate between specific occupations? Do policies set the minimum number/percentage of local employees, or maximum number/percentage of foreign employees? Do policies allow progression in the recruitment of local employees over time, or require immediate implementation? Do policies allow room for mining companies to waive requirements if no local employees with the needed skills are available? Do policies require mining companies to articulate plans on training to increase the number of the pool of skilled workers?
- **Reporting on local content performance** – How is the mining company required to report? Are the reporting requirements specific enough?
- **Safeguards against corruption** – What are transparency provisions? How can the need for transparent access to information be balanced with the companies’ needs to preserve information that can be used for market advantage? To what extent do plans and decisions on local content and employment depend on the discretion of government officials, and procurement officers of mining companies and large subcontractors? What are the possibilities to abuse the rules for personal gain?

228 For detailed discussion on local content policies, see Tordo et al. 2013. This World Bank’s study on local content policies in the oil and gas industry provides an extensive review of policies in different countries, as well as policy recommendations. Despite being focused on the oil and gas industry, many of the study’s recommendations are applicable to the mining industry as well. Also see a series of studies conducted by a research programme ‘Making the Most of Commodities’ in African countries by the Open University and University of Cape Town (Accessed 5 May 2017. <http://www.commodities.open.ac.uk/mmcp>); and Morris, Kaplinsky, and Kaplan 2011a.

229 Today, most mining operations are run not by vertically integrated mining companies, but are subcontracted. A large portion of spending of mining companies is on contracts with Engineering, Procurement and Construction Management (EPCM) or Engineering, Procurement and Construction (EPC) companies.

by the industry, retraining, forecasting the types of skills needed by the industry and using this information for providing training and education, investing in research and development, and promoting promising start-ups and small companies in the mining sector.

For example, in Chile, large mining companies established a Mining Skills Council in 2012 under the Mining Council, with the objective of addressing future skills gaps and shortages – the most critical challenge for the industry. Members of the Mining Skills Council worked together to standardize criteria for qualifications, created job profiles, and conducted projections of the skills for the industry for the next decade. This allowed the removal of inefficiencies in the training system, whereby each mining company had their own training centre, and allowed the educational system to collaborate with the industry in training for needed skills. Overall, this experience is seen as a crucial step for upgrading skills in mining to a sector with world-class skills; it has been emulated by other industries in the country.²³⁰

6.3 Mining and local development

Mining can bring development benefits to local communities. Local communities living in the impact area of mining have legitimate expectations that mining companies should not only mitigate the negative environmental and social impacts of their activities, but should also take actions to promote local development. These expectations are justified on the grounds of legitimate claims of these communities to the land where they reside and which is to be used by mining companies. In many cases, these claims – or rights – may not be legally recognized, but are usually socially legitimized because of the length of time that the community lives on this land and their connection to the land.

6.3.1 Corporate responsibility and mining

Increasingly, mining companies accept these expectations and seek to address them as part of their Corporate Social Responsibility (CSR) initiatives. (See Box 21 for the definition of CSR and other related concepts; see Section 4.4 on Voluntary standards).

6.3.2 Community development initiatives

To respond to local community expectations, mining companies often implement or fund local community development initiatives. By doing this, companies seek to build good relationships with local communities and to obtain a social licence to operate. Such initiatives usually focus on health, education, infrastructure and business development.

Most contributions to local development initiatives by mining companies take the following forms:

- Philanthropic donations to community groups, either in cash or in-kind, such as provision of equipment, facilities and supplies
- Funding and implementation of social campaigns and programmes, such as social service programmes, income-generating programmes, skill- and capacity-building programmes, and advocacy and awareness campaigns
- Funding and building of social infrastructure such as schools, hospitals and housing
- Financing of development programmes by providing grants

Payments to third-party or government funds used for social purposes such as improving education and health outcomes.

Large mining companies recruit community relations staff or dedicated Corporate Social Responsibility units to implement local development initiatives and engage local communities. Companies may also partner with NGOs and

²³⁰ United Nations Development Programme (UNDP) 2018.

Box 21 Key concepts in corporate responsibility

Corporate Social Responsibility (CSR) denotes “voluntary corporate practices that [...] benefit societies in ways that go above and beyond legal requirements”.²³¹ The concept of CSR has been debated and nuanced over the years. For instance, there are debates on how high or low should be the standard for CSR. UNDESA summarizes these various views on CSR, distinguishing between the minimum standard (complying with regulations and doing “no harm”), median standard (positive contribution of businesses to society beyond compliance – while justifying CSR as being good for business), and maximum standard (aligning business goals with societal sustainable development goals).²³² There is also an argument that corporate responsibility should not be merely “social”, since it is also about responsibility towards the environment. For this reason, the UN Global Compact uses the term Corporate Responsibility (CR), rather than CSR.²³³

Social Licence to Operate (SLO) means tacit, informal consent from the public to a company’s activities. This term has become widely used by the mining industry, based on “understanding that local perceptions or responses can determine a company’s ability to access land, water and other [...] resources”.²³⁴ The concept of the SLO is based on the idea that, in addition to government permits, mining companies also need permission or consent from the public to conduct their business.

Shared value means delivering outcomes of value to local communities as part of companies’ regular business activities.²³⁵ In the mining industry, for example, shared value can be created by developing the capabilities of local suppliers, going beyond regular market transactions. It is argued that such activities are beneficial to the company, as well as local suppliers. The concept of ‘shared value’ has been successfully promoted in business and academic circles by Michael Porter, considered one of the leading business theorists. However, the shared value concept has also been subject to criticism. The main criticism is that this concept is similar to a subset of CSR and can undermine the broader concept of CSR.²³⁶

Social investment, community investment, sustainability investment and impact investment – These are investments made by mining (or any other) companies for the benefit of society at large or specific communities, as opposed to investments made only for profit. Definitions vary, but in general emphasize that these investments are good for both societies and businesses. For instance, the International Finance Cooperation defines community investment as “Voluntary contributions or actions by companies to help communities in their areas of operation address their development priorities, and take advantage of opportunities created by private investment—in ways that are sustainable and support business objectives”.²³⁷ In recent years, a similar term, ‘sustainability investment’ has emerged and has become popular, highlighting the emphasis on environmental sustainability or sustained impact of these investments on societies or communities.

231 Vogel 2005, quoted in Anguelovski 2011.

232 United Nations Department of Economic and Social Affairs (UNDESA) 2007.

233 United Nations Global Compact and Bertelsman Stiftung 2010.

234 Owen and Kemp 2013.

235 Porter and Cramer 2011.

236 Crane et al. 2014.

237 International Finance Corporation (IFC) 2010.

international organizations. Where funding is substantial, mining companies may set up funds, trusts and foundations for the financing and implementation of local development initiatives. Particularly in the case of indigenous communities, local development initiatives may be formalized through agreements between the mining companies and the communities (See Box 23).

Often, as a company progresses from one phase of mining to another, it can move from philanthropic donations and ad hoc initiatives to programmes with sustained focus, and eventually towards institutionalizing its support to local development initiatives through formal institutional arrangements and/or agreements (See Box 22).

In the past two decades, community development programmes have become widespread in the mining, oil and gas industry. Moreover, some countries have adopted laws requiring resource companies to fund or implement community development programmes. In 2014, there were 32 countries which had such legal requirements.²³⁸

6.3.3 Challenges with community development initiatives

Mining companies' community development initiatives – or corporate responsibility initiatives – have been criticized that they are motivated by companies' business goals at the expense of attention to poverty reduction and sustainable benefits for local communities.²³⁹ The understanding of the importance of investing in sustainable development is still not widely shared within the mining industry, even though there has been a marked increase in such recognition, especially among leading companies in the industry.²⁴⁰ In particular, smaller mining companies (called 'juniors' in the industry), which tend to do mining exploration, are criticized for their lack of regard for local engagement and corporate responsibility.²⁴¹

Box 22 The progression of community development initiatives around the Sepon Mine in Lao PDR²⁴²

Sepon is an open-pit gold and copper mine in Savannakhet Province in southern Laos, operated by the Minerals and Metals Group (MMG). MMG developed a Social Sustainability Strategy in 2008, the main objective of which was to "maintain Social License and prepare for Mine Closure in an increasingly diverse and complex social environment".

During the exploration phase, most of the mine's investment in local communities were philanthropic donations to basic needs such as food, water or basic infrastructure. As relationships with the community matured through the construction and production phases, MMG's strategy focused on community engagement in designing community development initiatives, including health and education campaigns, the construction of solar-powered infrastructure for clean water supply, and community savings and loan schemes. It also organized community meetings, with strong focus on women's participation, on the basis of which it developed a Village Development Funds Programme to give grants to villages to implement their projects. MMG also set up a trust fund for regional development and prepared a closure plan.

²³⁸ Dupuy 2014.

²³⁹ Frynas 2005.

²⁴⁰ Buxton 2012.

²⁴¹ Ibid.

²⁴² McGuire and Reimann 2011.

Box 23 Community Development Agreements

In some cases, local development initiatives are formalized in community development agreements (CDAs). CDAs are made between mining companies and local communities to promote positive contribution from mining projects for local development and to formalize the obligations of parties in this process.²⁴³ CDAs may be used in different situations. For instance, when there is a brewing conflict between a mining company and a local community, CDAs are used to improve relationships between the parties.²⁴⁴ In countries where indigenous communities' rights to their land are recognized, CDAs are done to set out the terms for access to these lands for mining companies.²⁴⁵ More generally, CDAs are done as part of companies' corporate responsibility motivations and to gain "the social licence to operate".

CDAs go by different names (e.g. Benefit Sharing Agreements, Impact Benefit Agreements, Indigenous Land Use Agreements and Social Responsibility Agreements).²⁴⁶ CDAs have been used mainly in the context of indigenous peoples, but increasingly, such agreements are also made with other, non-indigenous local communities affected by mining, oil and gas.²⁴⁷ CDAs can be a condition in mining permitting processes, i.e. for issuing mining, environmental or land use permits, or they can be made independently of permits.

The scope of issues covered in CDAs varies greatly. However, a recent review of good practices found that CDAs commonly cover issues such as local employment, training, local business development, and the shared use of infrastructure.²⁴⁸ In the case of Impact Benefit Agreements (CDAs in the context of Canadian indigenous communities), the range of issues covered is wider. These agreements may cover royalties and other payments to be paid to indigenous communities; access to the land; respect for culture; compensation for people whose livelihoods are affected; environmental management measures, including mine closure and participation of indigenous communities in environmental monitoring; and a range of social measures.²⁴⁹ CDAs also include clear provisions regarding processes such as communication, stakeholder participation, governance, amendments and revisions of the agreement renegotiation, grievances and dispute resolution.

There are several stages in the process of agreement making: 1) making pre-agreements, such as Memoranda of Understanding (MOUs), to define the scope of issues to be included in the CDA, and to agree on financing of and procedures for consultation and negotiation; 2) conducting research, consultation and training/information provision; 3) conducting negotiations and making the agreement.²⁵⁰ To make lasting agreements, local communities should be provided with sufficient time for consultation, since reaching out to the critical mass of constituencies may take a lot of time particularly in the case of projects affecting large areas. Altogether, the processes of consultations, research, learning on both sides and negotiations can take several years. For instance, Rio Tinto's agreement with Aboriginal land owners at Argyle Diamond Mine in Australia took 3 years from

243 Brereton, Owen, and Kim 2011.

244 El Sourcebook Website, the World Bank: <http://www.eisourcebook.org/>. Accessed 25 October 2017.

245 Gibson and O'Faircheallaigh. 2010; Brereton, Owen, and Kim 2011.

246 El Sourcebook Website, the World Bank: <http://www.eisourcebook.org/>. Accessed 25 October 2017.

247 Dalupan 2015.

248 Loutit, Mandelbaum, and Szoke-Burke 2016.

249 Gibson and O'Faircheallaigh 2010.

250 Brereton, Owen, and Kim 2011.

the initial MOU until the signing of the agreement; ratification of a 30-year agreement with Rio Tinto Alcan by an indigenous group in Canada took 10 years from the first engagement with the community;²⁵¹ and in Mongolia, it took 4 years until signing of a community development agreement with the local government.²⁵²

CDAs are expected to have many potential benefits, such as enhancing the clarity and transparency of the relationship between the company and the community, greater and more structured engagement and capacity development of the community through the process of interactions to make the agreement, and improving the design of community development programmes due to companies learning from local communities.²⁵³

However, there are not many evaluations of CDAs which provide evidence of their benefits. Perhaps the most visible benefits are the flows of funds to local communities. However, there are studies that also identify other realized benefits. For instance, at the Argyle Diamond Mine in Western Australia, Argyle Participation Agreement and Participation Management plans were made in 2004 between Rio Tinto and the Aboriginal Traditional Owners, which helped to significantly raise the employment of aboriginal people – to 25 percent by 2008.²⁵⁴ A review of 14 Impact Benefit Agreements (IBAs, which are equivalent to CDAs in Canada) made by mining companies with indigenous communities in the Northwest Territories in Canada showed that in 1989–2008, employment, income and education levels in the communities with IBAs have improved more compared with those in Northwest Territories in general. For the most part, these agreements helped ensure follow-up on Environmental Assessments, in a way that was “never achieved before through regulatory processes like EA [Environmental Assessment]”.²⁵⁵ However, the performance of the IBAs in terms of capacity development and processes (engagement, communication) was mixed.²⁵⁶

During the recent period of intensified resource development prompted by high mineral prices, large mining companies invested in their CSR and community relations capacities, rather than merely public relations, as used to be common before. Nevertheless, community relations units within companies face numerous limitations that undermine mining companies’ performance in terms of local development – such as their low status vis-à-vis the ‘core’ engineering and other departments in mining companies, and lack of access to and attention of senior management.²⁵⁷

A broader problem with community development initiatives is that mining companies and local communities operate on a different timescale and often with a different worldview.²⁵⁸ To keep costs (such as interest on borrowing, remuneration of technical specialists and renting of specialized equipment) low and to make profits (by taking advantage of the relatively narrow window of time of high mineral prices), mining companies are motivated to move fast – which includes engaging communities, designing and starting community development programmes, and concluding

251 The processes can be prolonged in situations of mistrust and prior injustices in the treatment of indigenous or local communities, regardless of whether the particular mining company was implicated in these prior events. For example, in the first two of these cases, the process was complicated by prior injustices against the indigenous groups, and in the third case, it was complicated by public relationship failures by a junior mining exploration company.

252 Oyu Tolgoi-Umnugobi Cooperation Agreement. http://ot.mn/media/ot/content/our_commitments/communities/ca/OT_Cooperation_Agreement_EN.pdf. Accessed 14 November 2017. The duration of this CDA is tied to the Oyu Tolgoi investor-state agreement, which was to expire in 23 years at the time of signing of the CDA.

253 World Bank 2012.

254 Rio Tinto 2016.

255 Prno, Bradshaw, and Lapierre 2010.

256 Ibid.

257 Kemp and Owen 2013.

258 Kapelus 2002; Ruckstuhl, Thompson-Fawcett and Rae 2014.



community development agreements. But for indigenous peoples and other land-connected communities, they may lose land they have used for generations and see a potentially irreversible transformation to this land.

Local communities, particularly those with limited experience of mining in their areas, also lack knowledge about the business of mining, the science of environmental impacts, and the complexity of national, international norms and rules; this puts them at a disadvantage in engaging with mining companies to develop local development initiatives or in negotiating community development agreements that are beneficial to them. Lack of experience and skills also prevents them from making use of employment and business opportunities.

6.3.4 The role of governments in community development initiatives

The role of governments in enhancing benefits from mining for the development of communities impacted by mining has often been limited, particularly as it relates to community development initiatives. In some countries, governments underinvest or do not provide essential services to local communities in remote areas, which compels mining companies to implement community development initiatives in the first place. Even where governments are closely involved, they may put in place legal and regulatory requirements that are not coherent, not well-informed by the realities of communities, or that marginalize certain indigenous and minority communities. Greater understanding of CSR and CDAs and greater engagement with communities can help governments navigate the complex landscape of mining-community relations and contribute effectively to maximizing benefits from mining for local development.

Governments can play an important role in improving the effectiveness of local development initiatives, as well as community development agreements. They can integrate community development initiatives of mining companies into plans, policies and strategies for regional

development, infrastructure development, and public service delivery plans so as to coordinate and use synergies between mining company and government actions (See Section 6.4.3 on Integrating mining-related strategies and actions into development plans). They can also make plans, policies, strategies and laws coherent – both in terms of horizontal coherence (across different departments of the government) and vertical coherence (between national and subnational levels of government, as well as with international treaties and commitments) so that local development initiatives are facilitated and have more lasting impacts. Governments should also support the capacity of local communities impacted by mining, which can include funding training, supporting negotiations of communities over royalties earned from mining, and supporting coordination and partnerships among several mining companies for local communities' capacity development. Improving transparency and access to information – such as information on mining permits, fiscal revenues from mining, and environmental impacts – can go a long way to support the capacity of local communities.

6.4 Integrating mining into strategies and plans

In countries and regions with significant mineral resources, mining activities have a significant impact on and the opportunity to contribute to sustainable development. Governments should consider the impacts and benefits of mining on sustainable economic and social development and environmental sustainability. They should consider how their mining sector strategies fit holistically within their overall sustainable development visions, and within concrete plans, policies and strategies. By doing so, they can enhance the benefits and mitigate the impacts of mining industry for more sustainable development of their countries and regions.

6.4.1 Considering the overall impacts of mining

Traditionally, governments have focused mainly on fiscal benefits from mining, while putting a low priority on environmental and social costs of mining. Using tools such as SESAs, EIAs and Cost-Benefit Analysis and listening to communities is helpful for making an assessment of mining projects and activities that is more holistic and balanced.

Strategic Environmental and Social Assessments (SESAs) and Environmental Impact Assessments (EIAs), conducted before mine development, play an important role in assessing the overall impact of mining development, as they complement economic analyses (See Section 5.2 on Environmental and social impact assessment). Listening to local communities can uncover important evidence and knowledge to inform decisions about mining projects and overall mining sector strategies. For example, the government of Western Australia has undertaken the “Browse LNG Precinct Strategic Social Impact Assessment”²⁵⁹ as a planning diagnostic tool to determine the consequences of opening the Kimberley region to resource development and identify long-term strategies and actions.

Another important tool is a cost-benefit analysis (CBA). Cost-benefit analysis is a comprehensive form of project evaluation that lists economic, social and environmental impacts of a given activity on the region or the country, and attributes monetary value to these impacts. The activity or activities evaluated could be a single project, a series of investments in a given region, or a whole industry. By converting various impacts into monetary measures, CBA allows comparing positive and negative impacts to determine if there are net benefits of the activity – in this case mining activity. To do that, CBA uses methodologies that are by now well-established in environmental economics, such as the contingent valuation method, hedonic pricing method and travel cost method. CBA helps

decision makers consider trade-offs and determine whether mining is the optimal development option. CBA can provide credible results and findings which can be used for communicating about projects and policy decisions and for facilitating community engagement in deciding for or against mining.

Cost-benefit analysis is used by international organizations, as well as by many governments. For example, the government of Australia uses cost-benefit analysis to evaluate major infrastructure investment decisions.²⁶⁰ Some Australian states request cost-benefit analyses when evaluating large mining investment proposals.²⁶¹ The International Finance Corporation, part of the World Bank Group, provides support to help governments use cost-benefit analysis to assess large mining projects.²⁶²

The main downside of the cost-benefit analysis approach is that it cannot capture impacts on intangible values. Cultural, environmental and strategic losses are difficult or impossible to capture in monetary terms. For example, it is very difficult to put a value on the loss of a sacred site for indigenous communities that results from a mine site construction. In deciding the payment of AUD 3 million to the Ngaliwurru and Nungali indigenous groups as compensation for the loss of access to a sacred site at Timber Creek, an Australian judge admitted that there was no clear way to calculate the value of cultural loss.²⁶³ Moreover, attributing a monetary value to certain impacts, such as the loss of human life or the extinction of animal species, is considered morally or ethically wrong.

6.4.2 To mine or not to mine?

Mining is not inevitable. Governments can decide whether to support mining or to promote alternative economic activities that are based on the sustainable use of renewable resources. Analytical tools such as SEA, SESA and CBA can assist in making such decisions by assessing the

²⁵⁹ State of Western Australia 2010.

²⁶⁰ Infrastructure Australia 2016.

²⁶¹ State of New South Wales, Australia 2012a.

²⁶² World Bank 2010.

²⁶³ Australia, Federal Court 2016.

Box 24 “No-go” zones for mining in the Philippines²⁶⁴

In an attempt to balance mining rights and environmental concerns, the Philippines government has defined areas where mining projects are forbidden. The 1992 National Integrated Protected Area System classified protected areas and declared certain categories of protected areas as strictly “no-go zones” for mining. The 1995 Philippine Mining Act also identified areas closed to mining.

The Department of Environment and Natural Resources has developed a “no-go” zones map for mining, which is used in the issuance of new permits. However, the Philippines government still has to deal with mining permits already issued in protected areas.

total benefits of mining activity. If a government decides that mining is not appropriate for a given area, it can issue a blanket prohibition forbidding mining activities in that area (setting “no-go” zones for resource extraction). For instance, declaring a site to be a natural park or preserved area can make it off-limits for mineral exploration and exploitation. In 2003, member companies of the ICMM, representing some of the world’s largest companies, voluntarily committed to not to do exploration and mining in World Heritage Sites; this was a significant milestone. Some countries, such as the Philippines, have issued such blanket prohibitions to protect the environment and to preserve indigenous cultures (See Box 24).

Prohibiting mining in areas where mining is already taking place is problematic for both the government and investors. Governments take different approaches to this problem – some annul existing licences and contracts, while others apply the prohibition to new projects only. If they annul existing mining licences, governments can be subject to legal claims, particularly if the country is a signatory to investment treaties protecting investors’ interests (See Section 4.3.1 on Investment treaties). Moreover, cancelling licenses can have negative reputational consequences for the country, deterring future investment. It is also likely to lead to the abandonment of opened mine sites, with possible continued environmental impacts even after mining operations are ceased. At the same time, if prohibition of mining is only applicable to

new projects, the benefits for the environment and biodiversity can be very limited.

While it may seem obvious, the main way to address these problems is to prevent them. That means that governments should make decisions on whether mining activities should be prohibited before mining exploration and extraction permits are issued and investments are made. Detailed mapping is critical for governments and companies in making such early decisions, and such mapping requires ground surveys, which are usually costly and time consuming. An important aid in this regard is an international initiative, UNEP-World Conservation Monitoring Centre’s (WCMC) Biodiversity and Extractives Programme. Through this initiative, UNEP and WCMC, in collaboration with multinational mining, oil and gas companies, have created maps and databases that are easily accessible and thus allow companies to consider the biodiversity value of various sites early in their investment decisions.²⁶⁵

6.4.3 Integrating mining-related strategies and actions into development plans

The Intergovernmental Forum on Mining, Metals, Minerals and Sustainable Development (IGF), in its

²⁶⁴ Philippines, Chamber of Mines 2013.

²⁶⁵ See these maps and other tools on the following websites: World Database on Protected Areas (WDPA) and Protected Planet (www.protectedplanet.net); Integrated Biodiversity Assessment Tool (IBAT) (www.ibatforbusiness.org); Coastal and Marine Data/Ocean Data Viewer (<http://data.unep-wcmc.org>); Biodiversity A-Z (www.biodiversitya-z.org); and Proteus website (www.proteuspartners.org).

internationally agreed Mining Policy Framework, recognizes the need for “integrating mining and mines into local, regional and national fabrics”.²⁶⁶ To leverage mining for sustainable development, governments of resource-endowed countries should have a vision of how mining can contribute to the long-term sustainable development of the country and what strategies should be pursued by the government and other stakeholders – mining companies, local communities, civil society organizations, professional associations and others – to realize this contribution.

The coherence of policies, laws, regulations and other actions of the government need to be improved, both vertically and horizontally. Areas where a lack of coherence undermines the livelihoods and the rights of people, the environment, and potential of a country to earn fiscal revenues from mining have been highlighted throughout this sourcebook. The sourcebook has also showed experiences of countries which have addressed or are addressing such lack of coherence.

To be realized, strategies for leveraging mining for sustainable development should be articulated, operationalized into actions, and integrated into plans and policies. Possible entry points where this can be done include:

- *Integrating into national and regional development plans:* Many countries in Asia and the Pacific use national development plans to guide their development efforts over the medium and long term. In countries that rely on such development plans, articulating the government’s intent with regard to mining in national or regional development plans is important to shape government policies and inform investors’ decisions. In other countries, regional development plans play a more prominent role. Regional development plans provide a blueprint to address future needs for housing, jobs, infrastructure and a healthy environment. Changes to the economy and social structure of a region, triggered by large mining projects need to be understood and integrated in government planning.
- *Integrating into fiscal revenue projections, and medium- and long-term budget plans.* In countries with a large resource industry, taxes and royalties paid by mining projects account for a significant share of the government budget. In these countries, mining accounts for a large proportion of fiscal revenues, so budget planning needs to factor mineral price volatility and, where relevant, the decline of revenues due to depletion of mineral resources (See Section 6.1.3 on Managing fiscal revenues from mining).
- *Integrating into macroeconomic policies:* Rapid mining growth can prompt currency appreciation and inflate the cost of labour and other resources. Governments need to factor in mining cycles and long-term mining prospects when devising their macroeconomic policies, so that they stimulate the long-term competitiveness of non-mining sectors.
- *Integrating into land use plans or spatial plans.* Governments need to factor in mineral reserves and mining projects when planning land use and allocating land permits. For example, the government of New South Wales, Australia, has developed Strategic Regional Land Use Plans²⁶⁷ in response to concerns about the expansion of mining and competition for land with the agricultural industry. The plans provide a strategic framework for identifying strategic agricultural land and critical industry clusters which need to be protected from mining development.
- *Integrating into infrastructure plans.* Infrastructure investment by mining companies can drive the development of regional infrastructure, if it is coordinated with existing infrastructure and with public infrastructure investment plans. Integrating mining infrastructure investments into government infrastructure planning can help avoid duplication, improve efficiencies, create economies of scale, enhance public benefits and address cumulative impacts.²⁶⁸
- *Integrating into public service delivery plans.* When planning for the delivery of public services, such as health, education or water supply, governments need to take into account changes

266 Intergovernmental Forum on Mining, Minerals 2013.

267 State of New South Wales, Australia 2012b.

268 For policy papers and toolkits on shared use of infrastructure between the resource sector and the rest of the economy, see the website of the Columbia Center for Sustainable Investment “Leveraging Mining-Related Infrastructure Investments for Development”. Available from: <http://ccsi.columbia.edu/work/projects/leveraging-infrastructure-investments-for-development/>



induced by mining activities, additional public service needs stemming from these changes, and additional fiscal resource needs. The inflow of migrants to work in mining can overwhelm local government services and utilities. Without considering this sudden increase in demand for services, local communities might find themselves short on water, electricity, housing, health and other services. Governments should also integrate into their plans the various community development initiatives financed or implemented by mining companies.

- *Integrating into human resource development planning and education sector policies:* The ability of a country or region to benefit from its mining sector depends on the quality of its human resources. Governments – in collaboration with mining and other industries – should devise and implement human resource development programmes for mining and other sectors into which they seek diversification.

Such integration can help improve the horizontal coherence of policies and laws and coordinate government actions – for example, between government agencies responsible for mining policies, permitting, environmental regulation, resettlement, local development, infrastructure, education and many others. It can also strengthen vertical coherence – between central and subnational governments, as well as with international bodies.

Governments are important, but are not the only actors that determine how mining impacts on the economic, social and environmental dimensions of development. They need to collaborate with mining companies, local communities, international actors and other stakeholders in a way that promotes good environmental stewardship, efficient resource extraction, human rights, and the enhancement of economic benefits from mining.

Box 25 Mining and regional infrastructure planning in Australia²⁶⁹

The Government of South Australia produced in 2014 the *Regional Mining and Infrastructure Plan* to define how mining activities can contribute to the development of South Australia, identify infrastructure challenges that could constrain this contribution, identify potential infrastructure solutions which will support mining, and integrate them into the State's broader economic development. The plan has received funding from the State and the Commonwealth (Australian federal government). The plan is based on an assessment of the economic, social and environmental contribution of each infrastructure option to South Australia and its regions, including interaction with other economic sectors, and sets priority actions for the government.

As part of its planning process, the government of South Australia has produced several other reports to inform development decisions including: three subregional reports for the Eyre and Western region, the Yorke and Mid North/Braemar region and the Far North region, which propose roadmaps that identify infrastructure solutions to maximize the net benefits to South Australia by improving connectivity from existing mines and by reducing infrastructure-related risks.²⁷⁰

²⁶⁹ State of Southern Australia 2014.

²⁷⁰ Ibid.

RECOMMENDATIONS

Realizing and enhancing the benefits from mining

Designing and instituting progressive fiscal regimes that balance between the financial returns to the country (or the government) and those to the mining companies, in line with international comparisons

Making use of tools such as project-level mining fiscal models to estimate the government "take" from mining projects to design fiscal regimes and negotiate with mining companies

Ensuring that the fiscal regime is stable over time, which in the long term would help to move towards greater reliance on legal frameworks, rather than mining contracts

At the same time, ensuring flexibility of the fiscal regime to respond to the cyclical nature of the minerals and metals commodities markets, by building in contract negotiation clauses

Ensuring transparency of the fiscal regime (in the flows of resource revenues and in mining contracts) and access to information, by drawing on international transparency initiatives such as the EITI; ensuring a relatively straightforward fiscal regime that does not obscure transparency; and fostering an overall culture of transparency

Managing the volatility of resource revenues by using tools such as structural budget rules developed by the International Monetary Fund (IMF), and designing and instituting natural resource funds

Investing resource revenues in a way that increases (or does not deplete) the national wealth, into infrastructure, social service provision, financial assets and alternative sources of growth, setting priorities that are consistent with the country's level of development and needs

Using a combination of strategies to improve the competitiveness of domestic workers and firms and to set local content requirements to help enhance the benefits from the mining sector for employment, business development, and economic growth

Collaborating with and fostering collaboration between mining companies in order to design and implement local development initiatives, community development agreements and skills development initiatives

Supporting the capacity of local communities impacted by mining to take greater advantage of local development opportunities

Encouraging local development initiatives by mining companies to be synergized with government plans and programmes

Integrating the country's mining sector strategies with other plans and policies, such as national and regional development plans, fiscal revenue projections and budget plans, macroeconomic policies, land use plans, infrastructure plans, public service delivery plans, human resource development plans and education policies; and ensuring coherence between plans, policies, strategies and laws



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Children of artisanal miners gaze at the Letpadaung copper mine in Myanmar. Many of these children work on the fringes of the mine to try to help their families escape poverty.

Page 1-2: Degol Hailu

Large-scale coal mining in Mozambique. Mining is an important driver of the Mozambican economy.

Page 24: Samara Yawnghwe

A limestone quarry in Myanmar. Limestone mountains provide important ecosystem services and have tremendous archaeological and cultural value in Myanmar.

Page 37-38: Uyanga Gankhuyag

A coal mining truck in Tete, Mozambique. Mining and road transportation of minerals affect the environment.

Page 39: @Afghanite Company afghanite.net

Trucks with mined talc queuing on the Afghanistan-Pakistan border. Afghanistan's lack of capacity to process exports leads to major congestions at the Torkham border crossing.

Page 55: Uyanga Gankhuyag

Sheep grazing near a mine site in Mongolia. Extensive mining in central Mongolia is reducing available pasturelands and threatening the livelihoods of nomadic herders.

Page 75: Uyanga Gankhuyag

Workers leave their helmets at the entrance to a mine camp canteen in Mozambique. Employment at the mine provides higher incomes and a better future for miners, including for a growing number of women miners.

Page 104: Uyanga Gankhuyag

A coal mine facility in Mozambique. Energy and transportation infrastructure built by large mining companies can benefit surrounding communities.

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