Towards Realizing the Africa Mining Vision

A Guide for Reviewing and Improving African Mineral Regimes for Benefit Optimization

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1. Introduction

The Africa Mining Vision, which was adopted by African Heads of State in 2009, outlines the long-term objectives for utilization of the continent's mineral resources. Fundamentally, it advocates growth and development through maximizing the opportunities provided by those resources. The Vision is premised on findings that previous policies by African countries focused on attracting foreign direct investment and promoting the export of raw minerals, to the detriment of the development of local industries. Moreover, where there were financial gains from expansion of the mining sector, those gains were diminished by negative environmental, social and cultural impacts, and by generous incentives regimes. The earlier policies lacked the collective vision and strategies to integrate the mineral sector into national or regional economies (African Union, 2009, p.11). In many cases, this contributed to the destruction or weakening of other economic sectors (ibid.).[1] In contrast, the Africa Mining Vision favours an integrated approach to mineral development by which the continent's mineral resources are exploited in a sustainable manner and used as a catalyst or enabler for developing other sectors of the economy that have linkages to minerals and mining, such as manufacturing, infrastructure, services, technology, agriculture and research.

The purpose of the present guide is to review some of the instruments and strategies available to countries to achieve the objectives of the Africa Mining Vision. As noted in the Vision, "policies, legal and regulatory frameworks to facilitate equitable participation by local businessmen, communities and other stakeholders in mining activities need to be refined, as well as tools to improve revenue (derived from royalties, income taxes, land taxes, lease rents, etc.) distribution at local level" (Africa Mining Vision, 2009, sect. VI). Thus, it is acknowledged that the instruments and strategies required for optimization of the benefits from mineral projects exist or are known, but may not be applied in the appropriate manner. For example, when a value-based royalty is generally prescribed solely with regard to a country's high-value minerals, the country may obtain maximum revenues from such minerals. When such a royalty is also applied to low-value minerals, however, the country may not reap optimum economic benefits. In addition, while a range of instruments are available to countries, it is unclear which combination of such instruments can be applied to achieve certain objectives. Often, this stems from a misunderstanding of the instruments and their application in relation to mining. An instrument that is prescribed for the entire economic sector of a country may produce unintended consequences for the mining subsector. For instance, value added tax (VAT) generally imposed on inputs or services that fails to distinguish between exploration and mining inputs or services could limit the extent of exploration activities that lead to the development or expansion of mines. The present guide therefore is aimed at providing a mining sector context for various instruments and strategies that are used or can be used by Governments to maximize the value of mining to their countries' development beyond fiscal receipts.

In the present guide, "benefit optimization" refers to generating the maximum possible value from a country's mineral resources. In the context of the Africa Mining Vision, this value must contribute to sustainable development. While the most obvious or common means of maximizing value from minerals is through fiscal collections or revenues from royalties and other taxes, various factors determine whether more value can be obtained from the exploitation of minerals. Hence, apart from taxation or fiscal instruments, factors such as ownership of geological data, transparency, market prices and regional dynamics can variously have an impact on how much value is derived from a mineral resource project. Similarly, upstream, sidestream or downstream industries connected to a mineral resource project can create long-

[1] See also discussions in the resource curse literature, including Lahn and Stevens, 2018; Auty, 1993; and others.

term value for a country beyond the immediate income derived from the export of raw or unprocessed minerals, not least from the spawning of new industries to provide inputs for the mining and other sectors, an exponential increase in revenues from value added products or the utilization of mining-related infrastructure to spur the development of other economic sectors of the economy.

The guide is organized into six parts. The present introduction sets out the rationale for the guide, the meaning of "benefit optimization" as used throughout and the layout of the guide. Chapter 2 provides a review of the policy and regulatory framework for benefit optimization, including the relevant content of the policy and legal regime for mining. Chapter 3 covers tools for benefit optimization, i.e. common instruments and strategies for optimizing benefits, such as tax instruments, fiscal strategies, investment incentives, regional strategies and the mitigation of certain factors that hinder optimization. Chapter 4 provides an examination of selected legal provisions of mining laws or contracts with implications for benefit optimization. Chapter 5 offers a review of a number of fundamental issues that are germane to the effectiveness of the strategies and instruments discussed in the guide, namely institutions, human capital, mineral sector governance, and geological and mineral information. Lastly, in chapter 6, recommendations are set out for financial modelling, resource rent taxes, auctions, investment in technology and regional mining visions as critical to achieving the Africa Mining Vision.

The analyses in the present document are not intended as a substitute for obtaining expert advice and analysis relevant to each region or country, but they should provide the necessary context for officials or stakeholders in the mining sector to understand or competently interrogate the recommendations of experts or advisers to their Governments on these issues and to factor them into policy or decision-making that could have implications for the mining sector and their national or regional economy at large.

2. Policy and regulatory framework for the optimization of benefits

2.1. Mineral policy framework

A mineral policy framework is the overarching set of plans, principles or strategies that a country proposes to implement to develop its mineral resources. Such a framework may be expressed formally or directly in a national mineral policy document or implicitly in governmental actions or laws adopted by Governments. Many countries now choose to articulate their mineral development plans or strategies in a national mineral policy as a more orderly and purposeful approach to attract investment. Such a policy should set out, in a coherent manner, a country's objectives and plans regarding its minerals and the guiding principles for exploitation of the minerals. It should also articulate the role of the mineral sector in relation to other sectors in achieving a country's development objectives, which may be contained in a national development plan.

"Transparent, equitable and optimal exploitation of mineral resources to underpin broad-based sustainable growth and socioeconomic development" – Africa Mining Vision

A national mineral policy serves as a guide to all stakeholders, including investors, on major issues in the mineral sector, and provides context for governmental actions and positions concerning mining, including the enactment of mining laws and the negotiation of mining contracts, and the provisions of such laws and agreements. Often discounted, but perhaps most critical, the policymaking process itself that results in the set of strategies in comprising a national mineral policy is useful for building consensus among stakeholders for effective implementation of the policy.[2]

Different jurisdictions adopt different frameworks in their mineral policies. Often, the contents of the policy reflect the challenges and aspirations of the country at the time of adoption. For instance, most countries' policies set out how State sovereignty over natural resources will be exercised,[3] as well as intentions regarding artisanal and small-scale mining. Provisions related to Black economic empowerment are a feature in the mining charter of South Africa for historical and constitutional reasons. Issues of taxation and environmental protection are, however, common across jurisdictions. The density of the issues addressed in a policy depends on the maturity or sophistication of the country's governance system, as more detail is required to explain policies in countries with less mature governance systems. Where values such as transparency and accountability become entrenched, policies focus less on such issues and more on innovation and the optimization of linkages. Generally, a national mineral policy will comprise or address issues such as the scope of the policy; sovereignty; economic or fiscal

[2] Countries too often have a top-down approach to mineral policymaking. As mining is local and affects various stakeholders – many of whom are remote from the centres of power – it is imperative to develop policymaking processes that sufficiently and regularly raise awareness among stakeholders and the general public of mining issues, accommodate their concerns and expectations, and allow for critical review and consensus-building.

[3] For instance, article 69 of the Constitution of Kenya (2010) requires the State to utilize the environment and natural resources for the benefit of the people of Kenya. Accordingly, the country's mineral policy provides for pursuing a responsive regulatory framework that ensures that benefits accruing from the mining sector are maximized for greater socioeconomic development. Also, the mining policies and laws of Indonesia in relation to value addition are inspired by article 33 (3) of its Constitution (1945), which provides that: "The land, the waters and the natural resources within shall be under the powers of the State and shall be used to the greatest benefit of the people" (text of the Constitution available at http://extwprlegs1.fao.org/docs/pdf/ken127322.pdf.

strategies; social, environmental, legal, regulatory and institutional[4] frameworks; and artisanal and small-scale mining.[5]

2.1.1. Scope of mineral policy

A national mineral policy will typically specify the minerals covered or excluded,[6] their location within the country's territory,[7] the mineral activities or related activities involved[8] and the applicable fiscal regime. The scope of such a policy may extend to cover other relevant issues such as the environment, labour, exchange control, trade, gender and sustainable development if these are not adequately addressed by other policies or laws. There are significant implications for benefit optimization if the scope of the mineral policy is neither defined nor coherently articulated. Thus, a national mineral policy aimed at optimizing linkages based on minerals should address mineral processing and beneficiation activities, or ensure convergence of or coherence between industrial policies and the mineral policy. Similarly, specific fiscal policies may be required to boost investment in exploration or to capture a share of windfall profits for Governments. As the mineral policy provides the context within which all the mining laws, decisions and disputes are considered, it is important to define a scope that adequately captures all the critical issues for the country, including gender and innovation.[9] It bears noting that, while most African countries are at identical levels of development and face similar challenges, they also have unique issues and different levels of accomplishment and capacity. Thus, the scope must articulate the state of development of the mineral sector and the expectations as captured through public consultations.[10] *A Country Mining Vision Guidebook: Domesticating the Africa Mining Vision* (African Minerals Development Centre, 2014) and the processes it entails for adapting the Africa Mining Vision to the national context provide guidance on the development and implementation of a national mineral policy.

2.1.2. Sovereignty

Sovereignty is typically characterized by the ownership of minerals.[11] Lack of clarity about ownership and how control is to be exercised by the State can have consequences for the benefits that may be derived from the minerals. For instance, whether the ownership of minerals (all or some) is subject to the country's property rights regime or to any qualifications (e.g. transfer of ownership to an operator upon extraction) is relevant to determining price, facilitating trade and developing local industries. Governmental control measures in national mineral policies include strategies like price controls or production quotas, which have a direct impact on mineral revenues. Strategies for controlling market access such as designating an authorized buyer[12] or imposing export restrictions,[13] while disliked by investors, give Governments considerable latitude to optimize benefits through value addition policies.

[4] An institutional framework for implementing the policy may be set out as part of the legal and regulatory framework or separately in detail in the mineral policy or across other relevant national policies.
[5] Given the long history and prevalence of artisanal mining in Africa, national mineral policies also give significant attention to artisanal and small-scale mining, with a view to protecting local livelihoods.
[6] Due to different methods of extraction, fuel minerals, or fossil fuels, are covered under a separate policy.
[7] E.g. alluvial, surface, subsurface or offshore.
[8] E.g. exploration, exploitation, mine closure and reclamation, post-closure performance, mineral processing, economic linkages, community relations.
[9] Such as Mining 4.0.
[10] The Africa Mining Vision generalizes the expectations of the African people for their mining sector and the strategies needed to achieve these expectations, but each country can, through the country mining vision process, identify its entry points to implementing and achieving the Vision.
[11] In most countries, minerals are owned by the State on behalf of its people.
[12] Botswana requires its diamonds to be sold to "sightholders" established in the country.
[13] As in Indonesia and the United Republic of Tanzania.

Sovereignty also manifests itself in the roles of State agencies, including as corporate entities and regulators, in the mineral sector and control of the supply of minerals. However, restrictions on sovereignty as a result of accession to international treaties and agreements on national treatment, fair and equitable treatment, most favoured nation treatment and double taxation can have an adverse effect on benefit optimization. It is therefore prudent to review international commitments carefully and to consider advice from the relevant authorities in this regard.

2.1.3. Economic or fiscal strategies

"A sustainable and well-governed mining sector that effectively garners and deploys resource rents …" - Africa Mining Vision

Among the fiscal strategies that countries use to maximize revenues or benefits from mineral development are taxation (including by direct and indirect methods, a combination of tax instruments, varying levels or rates of taxation, tax incentives, revenue-sharing between the State and the investor, maximization of the Government's take, tax collection and monitoring mechanisms, transparency mechanisms and management of the utilization of mineral revenues); customs duties (e.g. different types or levels of duty, and measures to promote mineral-based linkages); employment and training of members of the local population; and conservation and efficiency strategies (e.g. ones that maximize present value and intergenerational equity, and that restrict the rate of mining). Other important issues that are considered in national mineral policies include economic linkages, infrastructure development and local community development, which all have direct implications for improving the benefits derived from mineral development. In addition to these considerations, the Africa Mining Vision encourages the intraregional harmonization of laws, regulations and fiscal regimes to reduce transaction costs, establish intraregional synergies, enhance competitiveness and realize economies of scale that would catalyse mineral cluster development (United Nations, Economic Commission for Africa (ECA), and African Union, 2010, p. 154). Unfortunately, most fiscal policies (and investment policies) focus on foreign direct investment, while ignoring local or indigenous capital that would ultimately deliver the economic linkages desired (African Union, 2009, p. 20). When they are taken into account in the mineral policies and appropriate incentives, local or regional investors can develop local skills, technology and other linkages for the minerals sector.

2.1.4. Environmental and social framework

"A sustainable and well-governed mining sector … that is safe, healthy, gender and ethnically inclusive, environmentally friendly, socially responsible and appreciated by surrounding communities" - Africa Mining Vision

Since 1989, the constitutions of most countries have guaranteed the rights to a healthy environment and ecological balance and given States the power to protect these rights (Bruch, Coker and Van Arsdale, 2001). While effort has been lacking in many sectors of the economy, national mineral policies typically address the environmental and social effects of mining and require special arrangements that address those effects. In addition to the environmental and social impact assessments and the strategies provided for in an environmental and social management plan (such as reclamation, financial assurance of environmental obligations, post-closure monitoring and management, community development obligations and alternative

livelihood programmes) that are required for an environmental permit or mining agreement, national mineral policies provide strategies for managing host community dependence on mining, improving social infrastructure and providing compensation and resettlement. Countries are advised to conduct a strategic environmental and social impact assessment to determine the environmental and social considerations to take into account in a national economic development plan or mineral policy. Such an assessment would focus on the impact of an intended activity on humans, flora and fauna, land, climate, air, water, soil and culture, among other things, and promote sustainable development objectives through rigorous, systematic and participatory processes. With the provision of an economic, environmental and social baseline through such an assessment, the cost for mining companies of obtaining a social licence to mine should be lower and consequently culminate in benefits to Governments, including the timely commencement of projects and fewer or no conflicts in host communities. If enforced, the environmental and social management plan should compensate for local costs or environmental impacts and social and cultural disruptions, and ultimately improve the quality of life in host communities.

2.1.5. Legal and regulatory framework

The first level of implementation of a national mineral policy is through a country's legal and regulatory framework, which distils the policies and strategies set out in the policy into specific requirements or instructions backed by law. A major consideration in a legal regime is whether mineral rights are granted administratively, contractually or judicially, or through any combination thereof (World Bank, 1996).[14] Any approach can yield optimum results if it is implemented effectively; however, administrative or hybrid regimes are common because they provide the same terms for some or all categories of mineral rights holders and are therefore simpler to administer. Other considerations with regard to this aspect of the mineral policy include applicable laws (including federal, regional, State or local government laws and the extent of application of related laws on fiscal, environmental, health and safety, gender and labour issues) and the powers and responsibilities of institutions responsible for managing the Government's multiple roles, including as regulator, manager, investor, promoter, "infrastructure developer" and protector of the environment and communities.

2.1.6. Artisanal and small-scale mining

"A mining sector that harnesses the potential of artisanal and small-scale mining to stimulate local/national entrepreneurship, improve livelihoods and advance integrated rural social and economic development" - Africa Mining Vision

Despite the prevalence of artisanal and small-scale mining on the continent, it is only since the late 1980s that such mining has become a major consideration in national mineral policies. Mineral policies before that time were focused on attracting investment for large mining projects that were considered to be the investments required to transform national economies. Accordingly, little or no policy attention was given to artisanal and small-scale mining. Indeed, in some cases it was prohibited.[15] Unlike large-scale mining, artisanal and small-scale mining is carried out mainly by indigenes or inhabitants within the community or country and requires significantly less capital, skills and technology than large-scale mining.

[14] The different regimes are discussed in sects. 2.4.1–2.4.4.

[15] E.g. small-scale mining of gold was not fully legalized in Ghana until 1989, with the passage of the Small-Scale Gold Mining Law of 1989 (PNDCL 218) (Aryee, Ntibery and Atorkui, 2003, pp. 131–140).

Due to the low barriers to entry, the sector employs large numbers of operators and sustains their dependants (United Nations, ECA, and African Union, 2010, p. 68). Nevertheless, the artisanal and small-scale mining sector is beset with many challenges, including poor skill levels and working conditions, inadequate legal, institutional, technical and financial support, illegal mining, sustainability issues and social problems. Consequently, the artisanal and small-scale mining sector in many countries is largely informal, poorly regulated and tainted by its association with environmental degradation (Ghana, 2014),[16] smuggling, tax evasion, health and safety risks, sociocultural dislocations and illicit financial flows (Kenya, 2016).

As recent policy efforts aimed at formalizing and providing appropriate technologies to the artisanal and small-scale mining sector have not successfully addressed the complexities of such mining, the Africa Mining Vision proposes an approach designed to recognize its socioeconomic characteristics. Therefore, mineral policies should incorporate strategies related to artisanal and small-scale mining to promote its contribution to national and regional economies. Some of these strategies include providing suitable or previously explored areas for mining, upskilling artisanal and small-scale mining operators, enhancing environmental, health and safety standards, facilitating cooperation between the artisanal and small-scale mining and the large-scale mining sectors, providing an appropriate fiscal linkage regime, promoting regional cooperation and providing an appropriate legal and institutional framework (Kenya, 2016; and United Nations, ECA, and African Union, 2010). In addition, strategies must be developed to address the vexed issue of progression from artisanal and small-scale mining to medium-scale or large-scale mining.[17]

2.2. Legal framework

A legal framework is the system of laws and regulations in force in a country. For mining, it is the laws and regulations that govern minerals and mining activities. As noted above, a country's legal and regulatory framework is a key instrument for implementing its mineral policy. More so than its mineral policy, a country's laws and regulations are enforceable or justiciable. However, the legal framework will not in and of itself ensure the optimization of benefits. What would help is coherence in the various laws applicable to minerals, transparency of the legal and regulatory regime and effective implementation of the laws.

Constitution

Most mining laws are subject to a supreme law or the constitution. This is because the constitution is the fundamental law of the land from which all other laws emanate.

"Every mineral in its natural State in, under or upon any land in Ghana, rivers, streams, water courses throughout Ghana, the exclusive economic zone and any area covered by the territorial sea or continental shelf is the property of the Republic of Ghana and shall be vested in the President on behalf of, and in trust for the people of Ghana" – Article 257 (6) of the Constitution of Ghana (1992)

[16] Ghana placed a moratorium on artisanal and small-scale mining in 2017.

[17] See e.g. the policies that propelled mining companies in South Africa under the country's Black Economic Empowerment programme to become successful companies, such as African Rainbow Minerals, which is a diversified mining and mineral company.

As the ultimate law, constitutions typically assert States' sovereignty over their natural resources.[18] This gives Governments the powers of ownership and control over minerals, the exercise of which includes making appropriate laws to regulate the development of the mineral sector. Some constitutions also provide for the ownership of land and interests in land, whether by the State, communities or private persons. Other provisions in a constitution that are relevant to minerals or mining include those that delineate the territorial area of the country, guarantee property rights (including guarantees against expropriation) and stipulate the executive's and the parliament's powers in relation to investments in mineral operations. For instance, the president or a government agent or institution may be charged with the prudent management of mineral resources and protection of human rights and the environment, and parliament may be required to ratify agreements relating to the grant of a right or concession for the exploitation of minerals.

Mining laws

A statute regulating mineral development can be comprehensive, as in a mining code covering various topics beyond exploration and mining, or it can be an outline or stipulations of basic principles or powers requiring further regulations or negotiation of contractual terms in accordance with the outlined principles. The latter is common in more mature mining jurisdictions, especially those that have efficient systems for regulating other activities in the country that are connected with mining, such as commerce, corporations, labour, occupational health and safety, environmental protection and dispute resolution. Current mining laws go beyond permitting or licensing mineral operations, imposing special taxes and obligations on mining companies, authorizing inspections of mineral operations and authorizing government entities to administer mining laws. They now also provide specifically for such aspects as managing rights (of landowners and miners), mining health and safety, explosives and hazardous chemicals, environmental protection, human rights protection, reporting obligations, localization, corporate social responsibility and dispute resolution.

Where fiscal linkages once concerned only incentives, mineral royalties, income taxes, State equity participation and exchange control, they now include special instruments for optimizing value from minerals, such as resource rent taxes, strategies for promoting mineral-based linkages, regulations concerning anti-transfer pricing and tax avoidance, tools for tracking and preventing illicit financial flows, and strategies for the improved utilization of mineral revenues and for the promotion of regional cooperation and integration. Similarly, the administration of mineral rights has evolved from merely granting and terminating licences to encompass administration of mineral cadastres and governance issues like transparency, public participation and mineral traceability, which ensure security of tenure for mineral rights holders and government accountability (Bickham, 2015).

Artisanal and small-scale mining is usually a key aspect covered by mining laws because of its prevalence and socioeconomic importance in mining-dependent countries. Therefore, special provisions or regulations may be dedicated to the entire artisanal and small-scale mining sector, including special regimes for licensing, taxation, environmental protection and the sale of minerals. To achieve the policy objectives of artisanal and small-scale mining as noted in section 2.1.6., the legal framework for the mineral sector must incorporate and enforce provisions to formalize artisanal and small-scale mining, improve access to financial and technical support, eliminate child labour and promote the exploitation by the artisanal and

[18] See also footnote 3 for implications of ownership.

small-scale mining sector of development minerals[19] for local industries, as well as graduation to medium- or large-scale mining.

Other laws

Apart from the constitution and mining laws, other laws have a direct or indirect impact on mining activities and can influence benefit optimization. As noted above, most such laws can exist separately from the mining law but are typically incorporated in a mining code. Due to their importance and relatively well-developed and extensive application in the economy, however, laws such as land laws, labour laws and investment laws can function on their own with regard to mineral activities. Nevertheless, complex land law regimes codifying customary land tenure systems can present significant challenges for investors in mineral operations, such as when customary interests in land have to be identified and compensated. Some investment laws also contradict mining laws or provide enhanced rights to investors that may not be available under the mining laws, such as rights to international arbitration for all disputes between the investor and the Government, including disputes that should be subject to national adjudication. Also, depending on the legal system of a country, international laws can form part of the legal and regulatory regime of a country upon the signing of international treaties or agreements, through their incorporation into national legislation or by ratification.

Regulations

If laws are the instruments for implementation of mineral policies, then regulations are the part of the instrument that does the heavy lifting. They flesh out legal requirements and provide standard forms, thus minimizing discretion and ambiguity. Most countries never have the full complement of regulations to implement their mining laws, perhaps due to lack of capacity in the technical areas in which these regulations are required. Apart from expertise sourced from abroad, various initiatives exist that support countries with technical assistance in such areas.[20] The range of areas that may be covered by regulations includes licensing (including auctions), the environment, health and safety, the use of explosives, community development, compensation and resettlement, protected areas and prohibited zones, transfer pricing, ring-fencing, local content, the compensation and resettlement of project-affected persons, downstream industries and the regulation of specific minerals (e.g. salt, diamonds, tanzanite, development minerals and strategic minerals).

2.3. Institutional framework

An dominant theme of the Africa Mining Vision is that an appropriate institutional framework is required to ensure its goal of integrating mining with industrial development for the transformation of African economies (African Union, 2009, pp. 1920).[21] Accordingly, the Vision identifies the need for appropriate institutions or capacity for improving the level and quality of geodata; capturing rents; developing relevant physical and knowledge infrastructure, technology and research and development; and resolving disputes. The traditional institutions associated with mineral activities such as those responsible for licensing, exploration and

[19] Defined as: "Minerals and materials that are mined, processed, manufactured and used domestically in industries such as construction, manufacturing, and agriculture". See www.developmentminerals.org/index.php; see also Afeku and Debrah, 2019.

[20] Such as the African Legal Support Facility and the CONNEX Support Unit.

[21] The Africa Mining Vision posits that African countries have not been able to optimize the benefits from mining because of "weak governance, particularly the lack of or ineffective appropriate institutions" (see pp. 19 and 20 of the Vision for a list of critical institutions for facilitating the optimal exploitation of natural resources).

mining, and the negotiation of mining contracts are relevant for ensuring fiscal linkages; however, the institutions that can enhance economic linkages include those that provide or facilitate the provision of training and research (United Nations, ECA and African Union, 2010, p. 131), collateral infrastructure (e.g. power, transport and telecommunications networks) for use in other economic sectors such as agriculture, tourism and services (ibid., p. 129) and financial resources (ibid., p. 130). The table below shows the range of institutions and the capacities required to ensure the efficient management of mineral resources and the attainment of enhanced benefits from them.

Examples of institutions and capacities required to efficiently manage and obtain enhanced benefits from mineral resources

Institution[a]	*Capacities required*
Governance Regulatory institutions, mineral audit agencies,[b] the legislature, the judiciary and dispute resolution institutions	Relevant technical skills; knowledge of the mineral sector; monitoring and evaluation; legal capacity; data gathering and analysis; ensuring of transparency, public participation and accountability; detection of corrupt practices; and objective use of discretion
Financing Capital markets (banks and stock exchanges)	Relevant technical skills; and knowledge of mineral sector, data collection and analysis, and financial modelling
Training/research and development Institutions of higher learning and technology, research institutions and geological surveys	Relevant technical skills; intellectual property; and effective cooperation with the mineral sector and other relevant sectors
Regulatory Regulators of all relevant sectors, e.g. the minerals, environment, energy, water, transport and infrastructure sectors	Relevant technical skills; monitoring and evaluation; legal, enforcement and coordination capacities; and objective use of discretion
Business Investment promotion agencies, State-owned companies, agencies managing State equity participation and government legal services	Relevant technical skills, including those related to business and finance, negotiation and international business
Management Office of the President, the Cabinet, the minister responsible for minerals, licensing authorities or the contract negotiation team, development planning institutions, policymaking institutions (including those responsible for tax policy), local government authorities, revenue collection and utilization institutions, industrial and other economic sectors, intellectual property institutions and civil society organizations	Relevant technical skills, including skills related to fiscal instruments and information technology; negotiation; financial modelling; revenue forecasting modelling; monitoring and evaluation, data collection and analysis; investment; international business; revenue management; and organization and coordination
Regional Regional economic communities, regional regulatory and oversight bodies, regional customs unions, free trade areas, dispute resolution bodies, development finance institutions, geological funds and spatial development initiative institutions	Relevant technical skills; knowledge of country's mineral and relevant sectors; relevant data collection and analyses related to minerals and other aspects; effective links with countries; cooperation, coordination and integration; revenue management; knowledge of international politics and international business; and fundraising
All institutions	Relevant technical skills; transparency; cooperation and collaboration; capacity to access, assess, distinguish between and adopt or engage civil society and international initiatives objectively and meaningfully; knowledge of international financial trends; development of linkages; and information-sharing

[a] List is not exhaustive; some of these roles may be performed by one agency or by different agencies.

[b] The Tanzania Minerals Audit Agency within the ministry responsible for mines monitors and audits the quality and quantity of minerals produced and exported, as well as mineral revenues. The Agency also audits capital investment and operating expenditure for the purpose of collecting relevant information that can be shared with relevant authorities.

For benefit optimization, the relevant institutions must be legitimately empowered, resourced and accorded suitable flexibility to operate and innovate.

2.4. Arrangements for granting mineral rights

While Governments intend to grant only enough rights to investors to facilitate mineral exploration and development in exchange for a fair share of the revenue from the minerals produced, investors demand as many rights as necessary to ensure that their investments are secure and yield the maximum return possible within the shortest period of time. Accordingly, an arrangement is required to accommodate or arbitrate the interests of Governments and investors. As noted above, the common types of arrangements for granting mineral rights are administrative, contractual and adjudicatory ones, or various combinations thereof (World Bank, 1996).

2.4.1. Administrative regimes

An administrative framework provides, through laws, for the granting of mineral rights by a permit or licence if the applicant satisfies certain criteria, including with regard to technical and financial capacity. The licence is granted by an administrative authority, e.g. the minister responsible for minerals or a designated agency or person. Many countries provide for a licensing regime which grants minerals on a first-come, first-considered basis. Despite its objectivity, this system does not ensure that the first applicant that acquires a mineral right will utilize the right more optimally than a later applicant.[22] In administrative regimes, the mining laws stipulate the same obligations and rights for all categories of mineral rights holders, which ensures uniformity of application of laws to all mineral rights holders; however, such rigidity, especially in the fiscal regime, can deter investments or lead to high grading of companies with marginal deposits. Similarly, regimes that stipulate long terms for exploitation (typically 25–30 years) without reference to the economics of the project are detrimental to benefit optimization. However, one advantage of this regime is that it affords government officials limited or no discretion in decision-making, thus leaving little room for corrupt practices.

2.4.2. Contractual regimes

Where mineral rights are granted under an agreement between the Government and a mining company or investor, the rights and obligations of the mining company or investor are stipulated by a contract rather than in the mining law. A mining contract typically grants its holder a range of rights, including those related to exploration, exploitation, processing and exportation of minerals, akin to the "unified concession" regimes of the past. These rights are usually granted up front upon execution of the mining contract. Therefore, unless the contract provides expressly for issues related to particular rights, it can be challenging to withdraw or alter the rights without terminating the mineral rights or the mining contract. At great cost, many Governments have learned the effects of poorly drafted termination and dispute resolution clauses in their mining contracts. Also, different mining contracts with different terms can pose challenges with regard to monitoring or regulation in countries without adequate capacities.[23]

[22] Thus, auction systems are increasingly being advocated to ensure that mineral rights are granted to entities that will maximize the value of the mineral resources.

[23] E.g. administering different tax or royalty regimes. These are not insurmountable challenges, however. Information technology solutions or innovations (including by motivated indigenes) offer possibilities for addressing such issues.

2.4.3. Adjudicatory regimes

Court-administered mineral rights are more common in civil law countries,[24] where instead of the minister or other regulatory agency, a judge or court official has the authority to grant and terminate mineral rights. Such rights are granted by judicial resolution in non-contentious proceedings, based on the recommendation or advice of the Government's department on minerals. Grants are recorded as final judgments of the court, recorded in a mining register and published in a public gazette. Any third party can demand that the mineral rights be cancelled if they can prove that the rights were not properly obtained. The obligations and rights of the mineral rights holder are typically stipulated in a mining code or may be provided as conditions to the rights granted. This system is considered to be effective if it is transparent and the judges act independently. However, unless judges and court officials are capacitated or have access to mining expertise, their actions may not always be technically grounded.

2.4.4. Other arrangements

Combinations or hybrids of administrative, contractual and adjudicatory systems are quite prevalent. For instance, some countries' mining laws set out certain minimum terms as the basis for negotiation of a mining contract. In its most liberal form, a contractual regime allows the parties to negotiate most terms of a specific mining project, including the type of rights granted, the duration of the rights, the minimum work and expenditure obligations of the company, incentives or fiscal concessions granted by the State, taxes payable by the investor and the mode of dispute settlement. In a hybrid form, the mining law may provide a range of stipulations within which the parties must negotiate, such as a maximum duration for the mineral rights and minimum or maximum rates of tax. Other regimes could provide for a contractual regime only when a minimum investment threshold is met or special deliverables would be provided, such as infrastructure or other economic linkage projects. The mining contract, known variously as a mineral or mining development agreement, or a special licence or agreement, is subject to the non-negotiable provisions of the law but may include negotiated terms for certain issues like the duration of the mineral rights, adequate capital requirements, minimum work obligations, fiscal issues, stabilization, infrastructure development and dispute settlement. In some cases, Governments exercise control over minerals and the mineral development process by requiring statutory approvals for critical matters such as feasibility studies, cut-off grade, rate of mining, mining method and life of the mine. Apart from infrastructure and economic linkages, Governments can also facilitate training and technology transfer through such agreements when they are not sufficiently provided for in national laws.

Comparable arrangements in the petroleum sector

Arrangements such as production-sharing agreements, service contracts and joint ventures, which are more common in the oil and gas sector, are contractual arrangements. Whereas under a typical mining contract the State's share of the gross revenue from the production of minerals is taken as mineral royalties at a stipulated rate, or includes a resource rent tax where applicable, under a production-sharing agreement, the State and the investor agree to share the net profits according to a predetermined ratio (in cash or in kind). In the case of a service contract, the investor agrees to provide the services for producing the minerals at a certain fee. Thus, the minerals or revenues remaining after accounting for production costs and investors' fees belong to the State. Under both arrangements, the mineral resources remain vested in the Government throughout the exploitation period while the investor's production

[24] Especially in South American jurisdictions, e.g. Chile.

company is tasked with the extraction of the resources. The Government may grant the investor exclusive rights to develop the oil or mineral resources with its own resources and at its own risk. Production-sharing agreements can take different forms, ranging from concession agreements to risk service contracts, under which the costs and risks of exploration and development are borne by the investor, who is paid only in the event that discovery and development occur. An advantage of service contracts is that the ownership of the minerals, equipment and other assets used in the production of the minerals is vested in the State or State mining entity, which could over time develop the capacity to carry out the mining activities by itself. Also, the State is typically the overall manager of the project and may appoint qualified project managers. The investor is only a contractor for the State. Costs and expenditure can be properly benchmarked and monitored to ensure optimum returns to the owner of the resources.

Joint ventures are common in the mining industry, especially among private investors who enter into such agreements to undertake large-scale mining operations. In some cases, Governments or their State mining entity join the partnership as an equity holder in the joint venture entity. Often, the government equity is "free" or "carried" (Otto, 2018), an acknowledgement or consideration of the Government's contribution of its mineral deposits or resources to the joint venture. The Government's ministry of finance or the State mining company would be the holder of the equity. Joint operating agreements are a variation of a joint venture in which the parties remain independent entities in an unincorporated venture rather than shareholders in an incorporated entity; such agreements are more common in the oil and gas industry. However, joint operating agreements are only as good as the parties to them, especially the State-owned party. Arrangements that are more transparent and include commitments to corporate governance and oversight are more likely to lead to successful outcomes (Heller, 2018, p. 315). Governments also need to pay attention to issues such as the capital structure of the entity, management or technical service agreements, dividend policies, relationships between affiliates, capacity-building of the government party, technology transfer, research and development, local content and dispute settlement mechanisms.

3. Tools for benefit optimization

3.1. Instruments and strategies for optimizing benefits

Revenue capture or measures to improve fiscal collections ensure that a country takes a fair share of proceeds from the exploitation of its mineral resources. However, an equitable share of a "small pie" is not optimal if the pie itself could be bigger. Thus, it is important to put in place fiscal arrangements that will ensure maximization of mineral revenues through efficient resource development. At the same time, strategies for enhancing economic linkages could be more beneficial than maximizing tax revenues.[25] These options need not be mutually exclusive or limited. Pursuing the development of linkage strategies could be viewed as investing a country's share of mineral revenues in other economic activities that would, ultimately, multiply growth and revenues.[26]

Box 1
Downstream linkage strategy of Botswana

Botswana took advantage of its ownership of a world-class resource with relatively low extraction costs (its 50 per cent equity stake in the diamond-producing joint venture with De Beers (Debswana)), the expiring of the company's mineral rights and the company's interest in renewing the rights, sound macroeconomic management and challenges facing De Beers at the time (loss in market power and high reliance on Botswana for its revenues and rough diamond supply) to negotiate the establishment of a downstream diamond industry in the country.

With significant pressure on De Beers, the Government of Botswana succeeded in negotiating the allocation of a certain percentage of rough diamonds from Debswana's and De Beers' worldwide production to cutting and polishing companies established in Botswana (sightholders) through an equally owned, locally incorporated joint venture trading company (Diamond Trading Company Botswana).

While Botswana could have continued receiving significant revenues from the sale of rough diamonds, the revenues were subject to market conditions, and would have eventually terminated upon the exhaustion of the minerals. However, due to its downstream strategy, the long-term benefits to Botswana have included the relocation to the country of more than 21 sightholders, a $500 million per annum and growing diamond sales market, the manufacture of jewellery, the establishment of an industrial park to facilitate the diamond supply chain, skills training and the creation of more than 3,000 jobs.

Source: Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development, "Botswana: downstream linkages: leveraging the negotiating position", case study, available at www.iisd.org/sites/default/files/publications/case-study-botswana-downstream-linkages.pdf; and African Natural Resources Centre, "Botswana's mineral revenues, expenditure and savings policy:- a case study" (2016).

In conceptualizing and designing a benefit optimization strategy, it is worth noting that current tax revenues may be more valuable or impactful than an equivalent return in the future.

[25] In accordance with a country's or regional economic community's benefit optimization strategy, i.e. a strategy to realize the most effective and efficient contribution of mining to economic or sustainable development.

[26] For example, a country could use such revenues or its entitlements (especially where receivable in kind) to catalyse the development of downstream value addition industries in gemstone cutting and polishing, jewellery manufacturing, electronic component manufacturing, alumina and aluminium smelting, electric car battery manufacturing and copper fabrication, among other things (see box 1).

While not mutually exclusive, the efficient capture, management and utilization of mineral revenues are imperative when linkages are not economical.

3.1.1. Instruments for the optimization of revenues

Instruments for the optimization of revenues are categorized as follows: (a) revenue-agnostic tax instruments; and (b) revenue-based tax instruments. In this context, revenue refers to the revenue that accrues to a mining company rather than a country.[27] Thus, the instruments are distinguished in terms of whether or not they apply to a company's revenues. While revenue-agnostic taxes are applied to the minerals extracted by the mining company, or to the activities involved or inputs used in extracting the minerals, revenue-based taxes are imposed on the company's revenues or income generated from the mining business.

3.1.1.1. Revenue-agnostic tax instruments

Depending on whether one is the Government or the investor, a basic advantage or criticism of revenue-agnostic taxes is that they shift the risk of mining to the investor. Such taxes guarantee a certain amount of revenue to the Government even in times of depressed commodity prices. Thus, the Government will be earning some revenue even while the mining company may be incurring losses.[28] Revenue-agnostic taxes include royalties (or severance taxes), value added taxes (e.g. export duties, sales taxes and property taxes), import duties and some categories of withholding taxes. They also include ground or surface rent and fees imposed on certain transactions, such as stamp duties and registration fees.

Royalties

Royalties are possibly the most certain means of ensuring that a country obtains some minimum value from the extraction of its mineral resources.[29] Royalties are premised on a country's sovereignty and ownership of its mineral resources and are deemed to be compensation for the removal of the resources (Otto and others, 2006; and Otto and Cordes, 2002). Thus, in their purest form, royalties are payable whether or not the minerals are extracted profitably. In their simplest form, royalties are taken out of the minerals produced – in kind[30] or on the basis of their gross sale value. Two types of revenue-agnostic royalties are common: unit-based royalties and value-based, or ad valorem, royalties. A unit-based royalty is stipulated as a certain amount per specific volume or weight of minerals produced. It is therefore suitable for homogeneous ores or bulk minerals, such as industrial minerals, construction materials and bulk minerals (e.g. sand, aggregates, dimension stones, coal, salt, phosphate, potash and limestone). Value-based royalties are stipulated as a percentage (or as varying percentages) of the gross sale value or the revenue obtained from the sale of all the minerals extracted from the ore, and are therefore better suited to less homogeneous ores or ores containing multiple minerals or derivatives.

Despite their simplicity, unit-based systems are less commonly used, perhaps because of the technicalities or complexity involved in determining homogeneity and mineral concentration. However, unlike value-based royalties, unit-based royalties will guarantee a

[27] The latter will be referred to as fiscal linkages.

[28] Given the mesh of fiscal measures applied to mining operations, such losses can be offset in various ways, including through loss carry-forward or carry-backward mechanisms.

[29] Although upfront payments such as signature or discovery bonuses (which are common in the oil and gas sector) ensure an early revenue stream for Governments before or at the onset of production.

[30] Countries must consider their marketing capacity and costs. Otherwise, such royalties could be useful for kickstarting a downstream linkage industry.

certain amount of royalty for a certain volume or weight of minerals produced. This stability in royalty receipts is lacking in value-based royalty regimes, under which royalty payments may fluctuate based on the value of the minerals, especially as a result of the impact of commodity prices on mineral sales revenues. While royalties in unit-based regimes will remain unchanged for the same weight or volume of ore, larger or smaller royalties may accrue to a country for the same quantity of ore depending on the price of the commodity if a value-based royalty is adopted. The uncertainty is compounded when there is no definitive reference price for a given commodity (e.g. bauxite, iron, tin and lithium) and prices are set by agreements, which are often deemed confidential. Due to their opaqueness, such transactions are subject to exploitation through tax avoidance devices such as transfer pricing. Furthermore, since they are revenue-agnostic, both unit-based and value-based royalties may cause marginal and less profitable operations to become uneconomic.

Box 2

Examples of types of mineral royalties

Unit-based (Sierra Leone)[a]

Royalty is payable at the rate of 1s 6d per long ton (2,240 lbs) of bauxite exported.

Value-based royalty (Botswana)

Mineral Type	*Percentage of gross market value*[a]
Precious stone	10
Precious metals	5
Other minerals or mineral products	3

[a] "Gross market value" is defined as the sale value receivable at the mine gate in an arm's length transaction without discounts, commissions or deductions for the mineral or mineral product on disposal.

Sliding-scale royalty

Mineral production (tons)	*Rate per ton (United States dollars)*
0 – 50 000	*5*
50 001 – 100 000	*6*
100 001 – 200 000	*7*

Hybrid (Nigeria)

Mineral	*Ad valorem (percentage)*	*Approved market value (Nigerian naira)*	*Approved royalty rate(Nigerian naira)*
Antimony	3	90,000/ton	2,700/ton
Bauxite	3	8,000/ton	400/ton
Coal	3	2,500/ton	75/ton
Gold concentrate	3	180,000/oz	5,400/oz
Sand	5	800/ton	40/ton
Wolframite	3	1,000/Kg	30/kg

Sources: www.a-mla.org; and Otto and others, 2006.

[a] *1961 Bauxite Mineral Prospecting and Mining Agreement between the Government of Sierra Leone, Sierra Leone Ore and Metal Company, and Aluminum-Industrie-Aktien-Gesellschaft.* See *Otto and others*, 2006, p. 97.

One way that countries optimize revenues while accounting for different scales of production or marginal deposits is through the application of a sliding scale or a graduated royalty rate to unit-based or value-based royalties.[31] For example, the rate of royalty may be determined for various thresholds of production as shown in box 2.

Many countries opt for value-based royalties or a hybrid system[32] in order to maintain a uniform system even though different mechanisms may be better suited to different minerals. Issues such as the cost of administration and capacity to administer the royalties (especially complicated forms of value-based royalties) commonly dictate the choice of royalty system used. Often, simpler or less technical systems are preferred or recommended. However, there is significant value or positive externalities in developing the capacity of tax authorities to administer complicated tax regimes, as this ensures that the tax authority more easily stays abreast of companies' avoidance mechanisms and modern forms or iterations of mineral taxation mechanisms that could provide optimal benefits. A well-resourced and sophisticated tax authority will progressively look for and develop appropriate tools to optimize benefits in the mining and other sectors of the economy. It is also worth noting that royalties that do not take into account the profitability of mining operations can be counter-productive if excessive rates of royalties lead to production cuts, shutting down of the mine or sterilization of ores.

Value added tax

Generally, VAT is charged on the value added to goods and services at each stage in the production and distribution chain. It is included in the final price a consumer pays for goods or services. VAT is typically restricted to goods and services consumed in the domestic economy (known as output VAT, or VAT on output). Many countries provide for exemptions or relief for specific items or goods used in the production of minerals[33] as an incentive for investment in the mining sector or to reduce investment costs. This is considered input VAT, or VAT on input, and is refundable to the mining company or offset against other taxes payable by the company. Other forms of value added taxes such as export duties and sales taxes may be applied to export goods such as minerals. Mineral exports are typically zero-rated as an incentive to investors. Paradoxically, VAT is charged on goods produced from minerals and consumed domestically while minerals exported in their raw form are not liable to export duties. Nevertheless, VAT and export duties can promote economic linkages, such as through modelling the behaviour of mining companies and compelling them to procure local inputs or provide minerals for local industries. For example, export duties may be reinstated or imposed on minerals exported in their basic form without meeting stipulated beneficiation levels, or VAT may be waived or reduced for mining companies that achieve stipulated local content thresholds. More effort must be put into the deliberate review of exemption policies to ensure that exemptions from VAT or export duties are not granted universally or in an arbitrary manner (for examples of value added taxes and export taxes on minerals, see box 3).

[31] A high rate of royalty will lead to mining of only high-grade ores, as marginal ores may be too expensive to mine (Franks, 2012).

[32] Hybrids of value-based systems such as profit-based royalties that take into account some form of costs or are sensitive to balancing the economic equilibrium between the miner and the resource owner are discussed under revenue-based tax instruments.

[33] Such as machinery, appliances and apparatuses used in mining.

Box 3

Value added and export taxes on minerals

The Value Added Tax Act, 2014, of the United Republic of Tanzania

- A value added tax (VAT) rate of 18 per cent applies to the supply of any goods or services
- Special relief is abolished and the number of exempted items reduced
- Value added tax registration is required for supplies will reach a value of TSh 50 million in a six-month period
- Exporters of raw material products, including raw mineral products (as from July 2017), are not eligible to claim a deduction for input tax used to the extent of exporting raw products for export purposes
- Exemptions apply to the import of goods for exclusive use in mineral exploration or prospecting activities, if such goods are also exempt from customs duties.

Source: PKF International, *Africa Tax Guide*, 2018–19.

Indonesian export taxes

- Indonesia is the world's largest producer of nickel and also holds the world's largest reserves
- In 2014, it imposed restrictions on the export of unprocessed nickel ores. (Copper, manganese, iron, lead and zinc could be exported in concentrate form subject to export taxes)
- Faced with declining mining production and revenues and job losses, revised regulations in January 2017 eased the restrictions until 2022, required mining companies to present plans to build smelters and processing plants within that time and imposed export taxes ranging from 0 to 7.5 per cent depending on progress in building smelters
- As of July 2019, 41 smelters were under construction, including 22 nickel-smelting plants with about 46 million tons of input capacity
- It appears that, for nickel production at least, Indonesia achieved its goal of increasing value addition and jobs and reducing the extraction rate for the country's nickel resources (in order to reduce environmental destruction).

Sources: Indonesia, Ministry of Trade Regulation; United Nations Conference on Trade and Development, 2017; and Reuters, 2019.

Custom or import duties

Custom or import duties are charged on the value of inputs imported for mineral operations. Since their introduction, such duties have been transformed from user fees for developing and maintaining ports and customs departments into tools for generating revenue for Governments and for developing import substitution industries. Most countries provide exemptions from or concessional rates of import duties on inputs used directly for mineral operations to lessen the financial burden of mining or mineral development for investors. (For an example of import duty strategies, see box 4).

Box 4
Examples from Ghana of import duty strategies

The objective of the Ghanaian regulations on minerals and mining is to create space for the local manufacture of certain imported mining inputs by withdrawing the import duty exemptions and imposing a penalty. Regulations 10 to 13 of the country's regulations on minerals and mining read as follows:

> 10. The [Minerals] Commission shall have a local procurement list and specify in the list the goods and services with Ghanaian content which shall be procured in Ghana by the holder of a mineral right, a licence to export or deal in minerals or a person registered to provide mine support services.
>
> 11. A holder of a mineral right, a licence to export or deal in minerals or a person registered to provide mine support services who fails to comply with sub-regulation (10) is liable to pay to the Commission the full customs import duty in respect of the goods imported and a penalty as provided in the local procurement list.
>
> 12. The mission shall review the local procurement list annually.
>
> 13. In assessing tenders for goods and services on the local procurement list, where bids are within two percent of each other by price, the bid containing the highest level of Ghanaian participation in terms of ownership and management by Ghanaians and employment of Ghanaians shall be selected.

Source: Ghana, Minerals and Mining (General) Regulations, 2012 (L.I. 2173).

Countries can also use import duties to complement strategies for developing economic linkages to the mining sector by taxing such imports at a rate that makes them uncompetitive in relation to local alternatives. In some cases, import duties are determined by common external tariffs stipulated by customs unions or regional economic communities to which the countries belong. Such harmonized tariffs are useful against tax competition as well as for optimizing government revenues or protecting local or regional linkage industries, including industries in special economic zones.

Withholding taxes on interest and technical and management services

Withholding taxes are taxes paid on behalf of a recipient of a payment by the mining company to ensure that the tax is accounted for immediately rather than later on. Such taxes are required by tax authorities to prevent evasion. Withholding taxes on loan interest payments and imported services are revenue agnostic. They may be applied at different rates to resident or non-resident persons (typically at a higher rate for non-residents) and be treated as a final tax. Apart from guaranteeing tax revenue for Governments, withholding taxes may be imposed on loan interest payments remitted abroad to influence the gearing or debt-equity ratio of a mining operation to encourage more equity participation or more local financing. The rate of tax for third parties may be different from the rate for entities affiliated to the mining company, to prevent transfer pricing.[34] Withholding taxes on imported technical services and management fees serve the same purpose as custom duties on imported goods or inputs for mining. Accordingly, such taxes may complement strategies for developing sidestream linkages such as to capital markets, financial services, legal services, insurance services, logistical services, communications services, and technology and research industries. A constraining factor may be tax rates (including withholding taxes) previously agreed in double taxation agreements or treaties between host countries and home countries. (For examples of withholding tax provisions, see box 5).

Box 5

Example of withholding tax provisions on interest and technical and management services

United Republic of Tanzania

Source of income	*Rate of Withholding Tax (percentage)*	
	Resident	*Non-Resident*
1. Interest	10	10
2. Technical and management services to mining companies	5	15

Ghana

Source of income	*Rate of Withholding Tax (percentage)*	
	Resident	*Non-Resident*
1. Interest	8 (not final)	8 (final)
2. Management, consulting, technical service and endorsement fees	-	20 (final)

Source: PKF International, *Africa Tax Guide 2018–19.*

[34] These qualifications are typically provided in regulations designed to combat base erosion and profit-shifting strategies.

Property tax

Typically levied and collected by local government authorities, a property tax is an annual tax imposed on real or immovable property such as mining plant and other physical installations at a mine. While property taxes are an essential source of revenue for local communities, determining an appropriate rate can be a vexed matter, especially where rates payable by mining companies are deemed by the companies to be arbitrarily determined and higher than rates paid by other commercial entities in the locality. Property taxes can contribute to the revenues and development budget of host communities and help to reduce reliance on national allocations, which may not be released in a timely manner. Access to a regular source of revenue by local Government authorities to manage the impact of mining activities can go a long way in managing the tensions between mining companies and host communities that result from the mining activities. Reasonable property rates can be determined based on objective criteria, such as the market value of properties and installations at the mine site, the size of the land, whether the area is urban or rural, and the type or use of the properties, whether residential, commercial, industrial or communal. (For an example of property tax policies, see box 6).

Box 6
Property taxes in Ghana

- The Local Government Act of 1993 empowers local government authorities to administer and collect property taxes ("property rates") in respect of mining companies operating in their localities
- The property rate is chargeable annually based on the value of the property
- Property rates are determined by the local government authorities after applying a formula to the valuation amount of mining properties; the valuation amount is determined by the district valuation board with approval from the regional board
- The local government authorities collect property rates directly from the mining companies
- Mining companies typically pay the rate levied in four quarterly instalments
- Mining companies' reports indicated a total payment of 5,147,626 Ghanaian cedis to local government authorities in 2018, representing 0.27 per cent of total government receipts from the mining companies
- There are no data available from the local government authorities on property rates collected or how the rates are imposed.

Source: Ghana, Ministry of Finance, 2019.

Surface rents

Given the dichotomy of ownership of mineral resources and the land containing the minerals in African States, surface rents are typically paid to persons other than the State. Accommodating the multiplicity of rights and ownership can present challenges regarding efficient management of the development of mineral resources. Therefore, addressing issues relating to compensation for the disturbance of landowners' surface rights is relevant to a country's benefit optimization strategy. As the State is the owner of minerals, the rights granted by it affect the surface rights of landowners. Countries resolve this in a number of ways, including by acquiring the land through eminent domain or requiring the mining company to

negotiate appropriate compensation with or make prescribed payments to the landowner. In Guinea, the ground rent is payable to the State. In Ghana, if the land is owned by a stool (chief) on behalf of the indigenes, the rent is paid to the government-run Office of the Administrator of Stool Lands, which distributes the rent received according to a constitutionally predetermined formula.[35] (For examples of surface rent policies, see box 7).

Box 7

Ground rent for mineral properties in Guinea and Ghana

Guinea, Mining Code of 2013

Type of mineral right	*Rate (United States dollars per km²)*		
	Upon granting of right	*First renewal*	*Second renewal*
1. Exploration permit	10	15	20
2. Industrial mining operation title	75	100	200
3. Semi-industrial mining operation title	20	50	100
4. Mining concession	150	200	300
5. Dredging operation permit	150	200	250

Ghana, Minerals and Mining (Ground Rent) Regulations, 2018 (L.I. 2357)

Type of mineral right	*Amount of annual ground rent*
1. Exploitation or mining rights with respect to: (a) Mining lease (b) Restricted mining lease	778.38 cedis per cadastral unit[a]
2. Exploitation or mining rights with respect to small-scale mining licence	31.50 cedis per small-scale cadastral unit[b]
3. Exploration rights with respect to: (a) Reconnaissance licence (b) Restricted reconnaissance licence (c) Prospecting licence (d) Restricted prospecting licence	6.75 cedis per cadastral unit

[a] cadastral until is equivalent to 0.21 km² or 21 hectares (about 52 acres).

[b] A small-scale cadastral unit is equivalent to 0.85 hectares (about 2.1 acres).

Source: African Mining Legislation Atlas, available at www.a-mla.org.

[35] Under Article 267 of the 1992 Constitution, 10 per cent of the revenue accruing from stool lands (including ground rent) is distributed to the office of the Administrator of Stool Lands to cover administrative expenses. The remaining revenue is distributed as follows: 25 per cent to the stool (chief) through the traditional authority for the maintenance of the stool in keeping with his or her status; 20 per cent to the traditional authority; and 55 per cent to the local government authority of the area where the stool lands are situated.

It is important that, where surface rents are to be stipulated or negotiated, the rates are fair and economic.[36] Factors to consider in determining an economic rent include the duration of encumbrance of the surface rights, the nature of disturbance of the land, the utility of the land after the mining operations, and any relevant customary land tenure system.[37]

Mineral right fees

Mineral right fees or licence fees are increasingly being raised and becoming a significant source of revenue for Governments, especially regulatory agencies, for managing cadastral and inspection activities related to mineral rights. In Ghana, such fees used to be stipulated as a one-time payment, but they have since been transformed into annual fees based on the type of right, the area of land surface covered and the duration of the mineral right (Aryee 2018, pp. 127-131). It would seem justified that as a country's mining sector matures, its mineral right fees would be increased to discourage speculation and free up lands for exploration by serious investors (ibid.). This inclination towards price discovery could more effectively be resolved through the auctioning of mineral rights, as in the oil and gas sector. (For examples of mineral right fees, see box 8).

[36] Some countries do not update their rent regularly, e.g. Kenya and Ghana (prior to its 2018 regulations), which did not update their rents for about 30 years, making them uneconomic.

[37] Some of these factors are considered in guidance notes such as the International Finance Corporation's guidance on land acquisition and involuntary resettlement, available at www.ifc.org/wps/wcm/connect/61320ff7-0e9a-4908-bef5-5c9671c8ddfd/GN5_English_2012.pdf?MOD=AJPERES&CVID=mRQjWGZ.

Box 8

Mineral right fees or licence fees

Sierra Leone

Mineral rights	*Annual charges*
Reconnaissance licence (flat fee)	$5 000
Exploration licence	
Years 1–4	$100 per km^2
Years 5–9 (first 125 km^2)	$400 per km^2
Years 5–9 (parts of areas in excess of 125 km^2)	$800 per km^2
Artisanal mining licence	250,000 leones
Small-scale mining licence	$600 per ha
Large-scale mining licence (flat fee)	$500 000
Dredging permit (artisanal)	$500
Dredging permit (exploration licence)	$2,500
Dredging permit (small-scale mining)	$10 000
Dredging permit (large-scale)	$20 000
Radioactive minerals permit	$20 000

Source: National Revenue Authority of Liberia (available at https://nra.gov.sl/individuals-and-partnerships/licenses).

Ghana

Mineral right	*Annual fee (in United States dollars per cadastral unit)*
Reconnaissance licence	
Year 1	16
Year 2	20
Prospecting licence	
Years 1–3	32
Years 4–6	50
Years 7–9	70
Mining lease	
Years 1–2	700
Years 3–30	1,000
Small-scale mining licence	10[a]

[a] Per small-scale cadastral unit.

Source: Ghana, Minerals and Mining (Licensing) Regulations, 2012 (L.I. 2176).

3.1.1.2. Revenue-based tax instruments

As noted above, revenue-based taxes are charged on revenues earned by the mining company. They are applied to a company's income, net revenue or profits. The most widely used form of revenue-based taxes is corporate income tax. Profit-based taxes such as windfall, additional, excess and super profits taxes and net-profits royalties are rarely in vogue, except in

commodity boom periods when many countries strive to impose or reintroduce them, often to no avail.[38] However, capital gains tax and withholding tax on profits or dividends are common.

Corporate income tax

Corporate income tax, or corporation tax, is similar to income tax assessed on individuals, except that it is levied on the income of a company as a legal personality. It is the most common form of taxation on all businesses, and countries or territories such as Mexico, Sweden and Greenland have relied solely on it for their mineral revenue. (Otto and others, 2006, p. 53). It is generally a proportional rate tax, i.e. a fixed rate that is payable irrespective of the tax base.[39] (For examples of corporate income tax rates in Africa, see box 9). Thus, a given rate (e.g. 30 per cent) is levied annually on the gross income of a company after accounting for operating and other "allowable" costs. Mining assets such as plant and machinery are pooled and allowed to be depreciated for income tax purposes. In recent times, countries have tended to favour straight-line depreciation, i.e. uniformly over the useful life of the asset,[40] over the declining balances or diminishing value method, under which the rate of depreciation is higher in the first year (e.g. 80 per cent) but lower in subsequent years (e.g. 20 per cent) until the value reaches zero.[41]

Box 9

Corporate income tax rates applicable to mining companies across Africa

A review of corporate income tax rates applicable to mining companies across Africa indicates a range between 20 and 35 per cent. On the low end, countries like Libya and Egypt charge 20 and 22.5 per cent, respectively, while Angola, Cameroon, the Democratic Republic of the Congo, Nigeria, Rwanda, Sierra Leone, Uganda and the United Republic of Tanzania apply a rate of 30 per cent. On the higher end, Ghana and Zambia impose a rate of 35 per cent. In Botswana, the rate is between 22 and 55 per cent but could be higher still in agreements for diamond rights. Different conditions or rules apply to determining the taxable income or the applicable rate, including with regard to source of income, allowable deductions and size of income, as well as whether the entity is a permanent establishment, branch or head office.

Source: PKF International, *Africa Tax Guide 2018–19*.

Key challenges of the corporate income tax include determining the chargeable or taxable income and determining a rate of tax that is fair to the Government and the investor. This would be a straightforward matter if mining projects were not complicated. Because mining projects are capital intensive and typically preceded by expensive exploration programmes, incentives are often granted to promote exploration or enhance the viability of the project and reduce the payback period (Aryee 2018, p. 155), including temporary elimination, suspension or reduction of the payment of income tax for a given period (tax holidays or

[38] Countries have been unsuccessful in this regard for various reasons, including resistance from mining companies or investors who argue that costs are also rising. In some countries, no advantage is gained because the boom recedes by the time the tax is negotiated or legislated, or the new taxes do not affect companies that they have fiscal stabilization guarantees.

[39] It is a progressive rate tax if the rate of tax increases as the tax base increases, as in the case of additional profit taxes or resource rent taxes.

[40] E.g. five years, as provided in part III of schedule 3 of the Ghana Income Tax Act, 2015 (Act 896).

[41] This method assumes that the value of the asset depreciates more in the early years of its effective life.

exemptions).[42] However, incentives should not be automatic, especially for projects determined to be viable.[43] The general rule is to deduct costs that are "wholly and exclusively"[44] incurred in the production of the income. Exploration costs or pre-production costs are generally allowable deductions. Ghana and the United Republic of Tanzania allow losses incurred in prior years of operation to be carried forward and deducted from the present year's income. Curiously, Sierra Leone allows the deduction of royalties paid (Sierra Leone, 2009, sect. 148 (4)). Environmental rehabilitation costs and corporate social responsibility expenses are increasingly being capitalized. Fines and penalties, as well as corrupt payments, may not be deducted, however.[45] That is also the case for donations.[46] It requires expertise and diligence to assess and determine which costs should be legitimately allowed or excluded and to determine a fair split of the net income. Countries may also be guided by international and local professional accounting bodies that study such trends and recommend standards. Ultimately, even the most favourable standards cannot guarantee an equitable share of mining revenue for Governments if the companies' expenditures are not scrutinized. To do this effectively often requires developing the required capacities and improving coordination between the tax, mining and environmental regulatory and local government authorities. Enhanced data collection, analysis and sharing among government agencies and countries can also facilitate effective benchmarking of costs and revenue forecasting to determine the appropriate sharing of the revenue.[47]

Resource rent taxes

Resource rent taxes capture the surplus value generated from mineral exploitation after all costs of production have been accounted for, including rewards for capital (Land, 2008). The tax is assessed on profits and is typically progressive, i.e. the rate of tax is assessed in addition to or on top of existing taxes (such as royalties or corporate income tax) because of increased income or profits. Thus, while corporate income tax is applied to the normal rate of return of a mining enterprise, the resource rent tax kicks in if the enterprise exceeds the normal rate of return. A resource rent tax is therefore assessable on surplus revenue after deducting all costs of production, including the investors' return on capital. (For an example of the application of a resource rent tax in Australia, see box 10).

[42] See below for a further discussion on incentives.
[43] Such as a world-class deposit with low production costs.
[44] In Kenya, Rwanda, South Sudan and the United Republic of Tanzania; "wholly and mainly" in South Africa; and "wholly, exclusively and necessarily" in Ghana and Nigeria.
[45] For example, in the United Republic of Tanzania.
[46] For example, in Botswana.
[47] The role of the Tanzania Minerals Audit Agency, as noted in footnote b to the table in sect. 2.3, is pertinent. The Agency monitors and audits the quality and quantity of minerals produced and exported, as well as mineral revenues. It also audits capital investment and operating expenditure for the purpose of collecting relevant information that can be shared with relevant authorities.

Box 10
The Australian Mineral Resource Rent Tax

- Passed in 2012 and repealed in 2014
- Taxed certain profits generated from the extraction of taxable resources, namely iron ore, coal, and anything produced by the in situ consumption of coal or iron ore, and coal seam gas
- Arguments for repeal included low and unpredictable receipts; the impact of increased State royalties on the tax; failure to address transfer mispricing; an increased compliance burden on the industry; an increase in country risk; and challenges related to interaction between State royalties, the company income tax and the Australian Mineral Resource Rent Tax (MRRT)
- The MRRT was calculated separately for each mining project
- The MRRT was calculated as follows: MRRT = A(B – C) – D – E, in which A is the tax rate, B is the mining profit, C is MRRT allowances, D is low-profit offset and E is rehabilitation tax offsets
- An entity was liable to MRRT if mining profit exceeded MRRT allowances; otherwise, MRRT liability would be zero
- The MRRT payable was the sum of the MRRT liabilities for each of the entity's interests reduced by any low-profit offset and rehabilitation tax offset available. No MRRT was payable if the available offsets were greater than or equal to the sum of MRRT liabilities
- The effective MRRT rate was 22.5 per cent, i.e. a nominal rate of 30 per cent less an extraction factor of 7.5 per cent
- Mining profit was determined by deducting mining expenditure from mining revenue, i.e. sale proceeds and recovery of previously allowed mining expenditure. Mining expenditure included certain operating and capital costs necessarily incurred by the entity in carrying on the mining operations
- MRRT allowances reduced the mining profit in order to determine the MRRT liability for that interest. An MRRT liability existed for an interest when mining profit exceeded MRRT allowances. The MRRT allowances were: (a) royalty allowance; (b) transferred royalty allowance; (c) pre-mining loss allowance; (d) mining loss allowance; (e) starting base allowance; (f) transferred pre-mining loss allowance; and (g) transferred mining loss allowance, to be applied in a particular order. The allowance highest in the order would be fully applied before the next highest could be applied. An entity had to apply all available allowances until its mining profit was reduced to zero
- MRRT offsets, i.e. low-profit offset (based on certain thresholds) and rehabilitation tax offset, were applied subject to meeting certain criteria and could further reduce the sum of MRRT liabilities.

Source: www.ato.gov.au/Business/Minerals-resource-rent-tax.

A resource rent tax is efficient if it is ring-fenced to a single project so that costs from less profitable projects cannot be offset against the revenues of a profitable project. As resource rent taxes move the tax burden from poor mines to rich mines, this will ensure that each mine pays a fair tax commensurate to its value.

A drawback of the resource rent tax for Governments is that the Government may not earn any revenues until an uncertain time in the future, if at all. This can, however, be mitigated by setting a minimum rate of return (hurdle rate), after which the tax is applicable. At a too-high rate, the tax may never become payable,[48] and at a rate that is too low, investors are not likely to invest in the mining project. It is therefore recommended to stipulate a rate based on the Government's sound and informed appreciation of the investor's return on capital. It has also been recommended to index the hurdle rate to the risk-free cost of capital for the country, such as the interest rate payable on a bond or long-term debt, plus a fixed margin, presumably to compensate for additional risks peculiar to the mining project (Land, 2008, p. 5).

Other concerns about the resource rent tax are administrative complexity and susceptibility to tax-avoidance mechanisms such as transfer pricing, which are common to profit-based taxes. To overcome some such challenges, it is recommended to ensure simplicity by applying consistent bases and concepts between taxes to aid administration and compliance (Murray, 2015, pp. 136–137). The repealed Australian Mineral Resource Rent Tax did not pass the simplicity test, as it was a federal tax that could not co-exist effectively with high corporate income taxes and high State royalties. This would not be the case for African countries with one central tax authority. Thus, the ideal tax regime could comprise reasonable revenue-agnostic taxes such as unit- or value-based royalties and revenue-based taxes such as corporate income tax to capture normal income or profits, as well as an additional profit tax to capture a share for Government of any exceptional profits from a mining project. Sliding-scale regimes that stipulate different tax rates at different or incremental hurdle rates may also be considered.

Capital gains tax

Capital gains tax is payable by a mining company when it makes a profit on the sale or disposal of a capital asset, such as a mineral right or a mining plant. In other words, the tax is payable if one sells an asset for more than the purchase price. The gain resulting from the transaction is subject to tax. Accordingly, ascertaining that a transaction has taken place and the true value of the transaction is pertinent. For instance, shares of a company may be transferred (directly or indirectly through layers of incorporation and shareholding structures) in lieu of a transfer of the mineral right to avoid transfer taxes. Governments are also keen to detect when companies have disposed of assets for which they paid concessionary customs duties or were granted exemptions, especially when such assets are transferred to entities in other sectors of the economy that are not entitled to such tax concessions or when the transactions occur outside their jurisdiction. Some of these issues require monitoring and scrutiny of the reports on the transactions submitted by mining companies to ensure that unauthorized dealings are detected and taxed appropriately.

This effort can be aided by adaptation of United States "look-through" rules, which cut through layers of control or ownership to make certain entities established in that country liable to United States taxes on earnings abroad.[49] In this case, given that the mineral property that is the subject of any transfer of interest, shares or assets is local, the parties to the transfer should be liable to local taxes on any gains made from the offshore disposal of the interest, shares or assets, wherever earned.[50] The tax itself has been applied in a number of ways. The more

[48] E.g. no taxes were paid under Ghana's Additional Profit Tax Law of 1985 (PNDCL 122) until it was repealed in 2000. The threshold rate of return and the tax rate were 35 per cent and 25 per cent, respectively (see Aryee 2018, p. 120).

[49] See Legal Information Institute, Cornell Law School, Electronic Code of Federal Regulations database, available at www.law.cornell.edu/cfr/text/26/1.904-5.

[50] E.g. In the United Republic of Tanzania, gains by non-residents from the disposal of investment assets such as land, buildings, shares and securities situated in that country are taxed at the single instalment rate of 20 per cent

common one is to treat it as a separate tax and apply it at the prescribed rate to a qualifying transaction.[51] Another way is to treat the gains from such transactions as part of the mining company's gross income, which is taxed annually at the applicable income tax rate (Ghana, 2015). The latter option should impose a lesser burden on tax administration, as it does not require a separate administration for capital gains.[52]

Box 11
Sierra Leone capital gains tax regime

57 (1) Capital gains tax shall be payable by a chargeable person at the rate of 30% of the capital gain accruing to or derived by that chargeable person from the disposal of a chargeable asset owned by a chargeable person.

(2) For the purpose of sections 57 to 61:

(i) "Capital gain" means the excess of the consideration received or receivable by a chargeable person (whether in cash, kind or by any other means) from the realization or disposal of a chargeable asset over the cost base at the time of the realization or disposal;

(ii) "Capital gains tax" means the tax arising from a capital gain;

(iii) "Chargeable asset" includes land and sea, property attached and integrated equipment, fixtures, improvements including leases, anything growing on the land and all interest in the property including sea which may be right to future ownership, right to occupy as tenant, life estate, the right to explore, develop, extract or produce oil, and other minerals, the right to shares, stocks and other investment opportunities in an entity, business or company, intellectual property rights, reversion of property, if it is not used for its current purpose, an easement across another person's property and any other privileges relating to the property, business and business asset including goodwill wherever situated;

(iv) "Chargeable disposal" means the sale, realization or change of hands of a chargeable asset other than those specifically exempt from capital gain;

(v) "Chargeable person" means a person, individual, corporation and related organizations including permanent establishment, associates, affiliates and joint ventures which have made chargeable disposal of a chargeable asset during a year of assessment.

Source: Sierra Leone, Finance Act, 2013; available at www.sierra-leone.org/Laws/2013-03.pdf.

Withholding tax on dividends

Withholding taxes are deductions made at the source of a payment to ensure that taxes that are due the Government are paid. They are usually assessed on the income of foreigners or non-resident persons that is earned in the country imposing the taxes. Apart from generating

regardless of whether the disposal is made inside or outside the United Republic of Tanzania. For companies, the net gain realized is taxed at a corporation tax rate of 30 per cent, with the single instalment tax creditable (PKF International, 2018).

[51] E.g. Kenya applies a rate of 5 per cent to the net gain on the transfer of property. Sierra Leone applies a rate of 30 per cent of the capital gain (see box 11).

[52] For further discussions, see United Nations, 2017.

income, such taxes can discourage the repatriation of profits to retain capital for reinvestment. The impact of withholding taxes may be affected by double taxation agreements that provide for reduced payments or non-payment of withholding taxes to a host State by investors from a home State.

3.1.1.3. Other instruments and strategies

In addition to the direct tax instruments discussed above, countries adopt various other strategies to maximize tax revenues that are generated from mining projects. Some of these are discussed below.

Ring-fencing

Ring-fencing refers to a situation in which a company's assets, profits or transactions are segregated for taxation or regulatory purposes, or in order to protect the assets. Ring-fencing is done to ensure that certain liabilities or unprofitable or loss-making operations are not set off against more profitable operations or projects, thereby reducing the threshold for taxation of the company. Thus, a company is prohibited from adding together all of the income and liabilities from all of its operations or activities for the purposes of reducing its tax burden. Governments generally resort to ring-fencing with the objective of ensuring an early flow of revenues or maximizing revenues from the more profitable mineral operations among other operations belonging to the same company. The particulars of each ring-fencing policy may differ, however. For instance, the ring fence may be applied to a single mine, or a number of mines comprising a project, or multiple mines within a certain locality or region. It may also require that accounts from the mine be segregated from non-mine accounts. While it is a useful practice, especially for optimizing revenue-based taxes,[53] ring-fencing may cause mining companies to restrict their exploration activities, as they cannot deduct such expenses from their more profitable operations.

Ring-fencing requirements may also create legitimate technical and financial difficulties for a company, such as when the proximity of the company's operations justifies the utilization of common resources such as a plant or other infrastructure or personnel. It may also be counter-productive to the development of linkages or investment in research. Some Governments allow only exploration activities within a concession or mineral right area to be offset against revenues from a mine located in the same concession or mineral right area. In addition, when the use of common resources is permitted across non-ring-fenced operations, companies could resort to creative accounting or tax avoidance practices. The considerations that Governments must take into account therefore include the need for precautions against tax avoidance and for balancing early revenues against the development of a future tax base. The decisions made by each Government should reflect its own context and overall objectives for benefit optimization.

[53] Resource rent taxes in their purest form are ring-fenced taxes.

State participation

State participation in natural resources projects is not novel (McPherson, 2010). The practice is as important for economic reasons as for its symbolism. It also enables countries to exercise some control over investors, build national capacity and facilitate other national development goals such as job creation and the development of linkages and infrastructure. However, the outcomes have not always matched the intentions. Often, the same objectives can be achieved through other means such as regulatory processes or policy and fiscal instruments. Challenges include those related to funding (scarcity and the risks involved in using public funds for such projects), governance (lack of transparency, politicization, elite capture and poor macroeconomic management), inefficiencies (due to lack of competition) and conflicts of interest (due to roles in investment promotion, regulation and commercial enterprise) (ibid.). State participation can be a useful strategy for optimizing revenue and developing the capacity of nationals. It can take many forms, including participation as: (a) a holder of equity interest in a mining company (i.e. a fully paid-up shareholder and contributor); (b) a carried equity interest holder (i.e. the investor pays the State's contributions and recovers it from production); or (c) a free carried interest holder (i.e. the State has no financial obligation for its equity interest).

Other options for State participation include production-sharing arrangements (as are common in the petroleum sector), in which the State mining entity (the national mining company) is involved in the mining operations as a commercial partner of a private entity and is entitled to receive a predetermined share of the production or revenues after the private entity recovers its costs. In countries where State participation has been successful, there has been a clear focus on commercial efficiency, good governance (including effective public engagement, transparency and little or no government interference), a sound national economy and a high level of education and management skills (ibid.). Governments can explore floating some of their interest on local or regional stock exchanges. The National Office for Hydrocarbons and Mines of Morocco provides some lessons for developing a State-owned exploration company with expertise in mineral and petroleum exploration, which it capitalizes through sales of mineral properties or joint venture transactions with production companies.

Auctions

Auctions or competitive bidding processes are an efficient way of allocating and determining the price of scarce resources such as mineral resources. Auctions determine through competition who should be given the right to mine the resources and at what price. They are more commonly used in allocating oil and gas acreages and spectrum rights, for which they have garnered between 70 and 90 per cent of resource rents for some countries (Crampton, 2010). Auctions are perhaps less used in the mining sector due to the unique aspects of evaluating mineral exploration data. Unlike exploration for oil and gas, in which the early stages of such exploration can lead to robust assumptions about economic potential due to the relative clustering properties of petroleum deposits, minerals are less clustered and require significantly more exploration over wider areas to delineate a significant deposit or trend (Ortega, Pugachevsky and Walser, 2009). Accordingly, petroleum companies are keener to acquire more acreage for exploration based on early stage data, and Governments that have such data can take advantage of competition for the resources to capture economic rents through auctions (ibid.). Governments tend to be in a weaker position in mineral rights auctions unless the data are sufficiently reliable (such as a producing mine or a property with proven or indicated reserves) or the mineral deposits are more clustered (e.g. iron, limestone, granites, dimension stones and kaolin). Petroleum also tends to have a high economic attraction due to governmental

restrictions on its supply (ibid.). Therefore, Governments must improve the quality of their mineral resources data to stimulate competition for mineral rights.[54]

The Minerals and Mining (Licensing) Regulations of Ghana[55] provide for the granting of mineral rights by auction in respect of areas in which: (a) sufficient mineral information exists; (b) the State has carried out prior exploration; (c) the area becomes available due to surrender, revocation or termination of a mineral right; or (d) more than two applications are received within seven days of becoming vacant. Nevertheless, Ghana has not conducted any auctions since the law was promulgated in 2012. Given the demand for mineral right applications and transfers in that country,[56] more revenue could be derived through mineral rights auctions that guarantee the real value of mineral properties. Governments can also through auction processes facilitate the development of economic linkages, especially for industrial or development minerals. The regulations of Rwanda for the acquisition of mineral rights provide for bidding and evaluation criteria that include plans for value addition, community development, environmental management, infrastructure use and development, local procurement and employment and training.

3.1.2. Strategies for optimization of economic linkages

One of the cornerstones for achieving the Africa Mining Vision goal of resource-based industrialization and development is through maximization of mining sector linkages, premised on the extensive resources of the continent. The rationale is that tax revenues alone have not been and will not be sufficient for the development of countries on the continent. The strategy is therefore simply to leverage the continent's world-class mineral resources to develop industries linked to the minerals, including upstream, sidestream, and downstream industries.[57] Opportunities for the development of linkages exist along every stage of the minerals and mining value chain, from exploration through consumption or utilization of the minerals in industry. Other opportunities are emerging with full automation of mining operations and "Mining 4.0".[58] Hence, appropriate policies and laws, as well as the implementation of relevant linkages and investment strategies, are required to harness these opportunities to ensure benefit optimization.

3.1.2.1. Upstream, downstream and sidestream linkages

Upstream linkages are aimed at developing industries that supply inputs to the mineral sector, including capital goods, consumables and services, that are currently produced and imported from abroad. Downstream linkages take account of the minerals produced and their utilization or transformation into other products. Sidestream linkages include infrastructure (power, logistics and communications), skills and technological processes (human resources development, and research and development) that enable the mining operations, as well as the upstream and downstream industries, to function effectively. Policies employed to promote upstream linkages have included taxation (customs duties and VAT on imported inputs) and

[54] E.g. like Morocco (through its National Office for Hydrocarbons and Mines), which funds its own exploration. In addition, Rwanda funds exploration of areas designated as potential mining areas that are to be licensed through auctions. However, exploration companies submit useful exploration reports to Governments that could be analysed and packaged for auctioning.
[55] See Ghana, 2012 (b), regulations 257–266.
[56] The number of applications for mineral rights in 2017 and 2018 were 205 and 363, respectively (see Ghana, Ministry of Finance, 2019).
[57] These linkages are discussed in depth in United Nations, Economic Commission for Africa (ECA), and African Union, 2010.
[58] See http://ccsi.columbia.edu/files/2015/07/mining-a-mirage-CCSI-IISD-EWB-2016.pdf.

incentives (discussed below) to induce investment in upstream industries, and pressure from Governments and local communities. More recently, elaborate supplier development programmes have been promoted to facilitate upstream linkages in South Africa (South Africa, 2018, art. 2.2) and Ghana.[59]

For downstream linkages, it would appear that the opportunities for developing such linkages are fewer, given that more developed countries have a comparative advantage over mineral-producing countries due to, among other things, market size, lower risks and costs of production, advanced research and development, and intellectual property regulations. While this may be the case for some minerals,[60] there is a strong case to be made for the further processing of bulk ores or the production of goods that are widely consumed locally.[61] Nevertheless, the conventional wisdom does not always hold true. The cutting and polishing industry in Botswana was established at a late stage of the mining sector's development and has been thriving even though the market for the diamonds is not local. Similarly, there is potential for jewellery manufacturing using the myriad metals and precious and semi-precious stones the continent has. However, some critical factors must be addressed to enhance the success of linkage industries. These include the need for sound macroeconomic conditions, infrastructure such as power and transportation, and political commitment.[62] Tax instruments such as export duties imposed on mineral exports can guarantee feedstock for local manufacturing industries, especially industries that produce goods that have a local or regional market, such as fertilizers, cement, aggregates, paints or steel.

The utility of sidestream linkages lies in the fact that they are more easily shared with or transferable to other sectors of the economy and, with deliberate planning, their benefits can be optimized significantly. African countries face an uphill task in developing economic linkages, mainly because of institutional, infrastructure and human capacity challenges. However, inherent in these challenges are opportunities for developing the sidestream linkages that will serve the mining sector, as well as other sectors of the economy. Thus, with deliberate strategies, as well as suitable infrastructure, political commitment and pressure, the development of regional markets and sound macroeconomic conditions can take place, and the conventional wisdom or perception that imported inputs and foreign industries are more competitive, of higher quality and more innovative, and that they have better access to markets, can be challenged.

3.1.2.2. Investment incentives (fiscal, financial and regulatory)

Investment incentives are generally strategies used by Governments to induce or stimulate private sector investment in specific areas of the economy, mainly to boost capital expenditure, increase employment, facilitate the development of an anchor project or open up certain parts or sectors of the country. Incentives take different forms, including fiscal, financial or regulatory (Harpell, 2016), but are essentially intended to promote investment in sectors or areas investors would otherwise shun due to prohibitive or unattractive capital costs or unguaranteed returns.[63] For incentives to be effective, Governments must obtain certain benefits for providing them, and the benefits ought to outweigh the cost of the incentives.

[59] E.g. the national supplier development programme in Ghana is being implemented with the assistance of the African Minerals Development Centre (see United Nations, ECA, 2018).
[60] Especially high-value and low-volume minerals such as gold, diamonds and platinum group metals.
[61] Such as building and construction materials like sand, gravels, cement, paints, nails, steel, roofing sheets, aluminium products, tin products and mobile phones, along with fertilizers for the agricultural sector.
[62] As shown by Botswana and Indonesia in developing their diamond and nickel-smelting industries, respectively.
[63] E.g. social services.

Investment incentives should not be considered as compensation for a poor investment climate (Perera, 2014, p. 6). To ensure that investment incentives lead to the optimization of benefits from mining, the objectives of the incentives must be clear and attainable and based on relevant and accurate data, and they must pass a cost-benefit analysis test (Harpell, 2016). Incentive strategies are relevant if conceived, designed and implemented within a broader sustainable development context, nationally or within a regional economic community. Incentives must also be applied in a transparent manner and be monitored and evaluated regularly to ascertain their effectiveness, including their impact on the wider economy. Additionally, incentive regimes ought to be implemented objectively through a legal and regulatory framework rather than in a discretionary manner, to minimize implementation costs and the potential for abuse. Perhaps most importantly, such regimes must be discontinued once their objectives have been realized.[64] It is also prudent to review international commitments carefully and to consider advice from experts concerning proposed incentives regimes and their compatibility with applicable World Trade Organization agreements (United Nations, ECA, and African Union, 2010, chap. 9).

Fiscal incentives

Fiscal incentives have the effect of reducing the amount of taxes payable by an investor. Such incentives include tax concessions or exemptions, tax credits, capital allowances and loss carry-forward or carry-backward. Tax concessions or exemptions provide investors with full, partial or other relief from the payment of taxes, typically corporate income taxes.[65] For instance, investors in the mining sector may qualify for the payment of taxes at a lower rate than investors in less risky sectors of the economy, or for investing in an integrated mining operation.[66]

Tax credits exist in various forms, including to induce a desired result (e.g. efficiency, research, employment of members of the local population or procurement of local goods and services) or investment in the provision of public goods (e.g. roads, hospitals, schools or corporate social responsibility), and involve deduction of the acquired credits from the tax payable by the investor. While tax concessions or exemptions lead to a reduction of the amount of taxable income, tax credits reduce the actual amount of tax owed. Capital allowance refers to a deduction that an investor is allowed to make from taxable income for certain expenses. For instance, to promote exploration, expenditure on exploration may be capitalized and deducted by a company from its income when mining commences.[67] Deductions may also be allowed for the depreciated value of other capital assets, such as plant and machinery required for mining. These deductions are an incentive to the investor because they reduce the tax liability of the investor further than the depreciation applied for accounting purposes. In some cases, the application of these incentives may lead to losses. Losses made by an investor, including those resulting from the application of fiscal incentives, may also be carried forward or backward. Loss carried forward refers to the incentive given to an investor to treat previous years' losses as allowable deductions from subsequent years' profits. Conversely, a loss carried backward is deductible from an investor's previous years' profits,[68] thus resulting in a tax refund to the investor.

[64] All too often, incentives are allowed to continue long past their usefulness or effectiveness, giving beneficiaries a sense of entitlement that can be difficult for Governments to later curb.
[65] Also, from taxes on dividends and interest payments.
[66] I.e. a mining operation that includes value addition in its operations.
[67] Various methods are used, including full depreciation or depreciation on a reducing-balance basis or over a certain period.
[68] Typically for up to two years.

Financial incentives

Financial incentives are aid or support given to investors to facilitate an investment or an aspect of an investment, such as grants, subsidies, loans, sovereign guarantees or special or targeted infrastructure. They may be free (such as grants) or partially or totally reimbursable (such as loans) (Tavares-Lehmann and others, 2016). Financial incentives are more commonly used by developed countries, especially to subsidize capital formation in manufacturing and emerging industries such as the auto, semiconductor and green technology industries. Many developing countries prefer instead to waive revenues (i.e. provide fiscal incentives). This may be because financial incentives involve giving monies (which may be in limited supply) to the investor.

The different incentives serve different purposes. A financial incentive is less risky, as it provides a more immediate benefit and will likely induce an investment more quickly than a fiscal incentive that is applicable after the investment has been made. For example, grants in the form of cash payments to the investor intended to lower the investor's costs have been used to induce investment, especially in areas Governments consider beneficial in the long run, e.g. research, training and job creation. Subsidies are similar, except that they are more likely to be granted to offset an investor's operating and management costs, rather than specific aspects of the investment. Loans are another form of financial incentive that may be provided by countries when, for instance, investors cannot get funding for the project or the funds are too costly. The loans may be provided at non-concessional or concessional rates, including favourable terms like extended payback periods.

Other forms of financial incentives like targeted infrastructure such as roads, railways, ports or energy may be provided by countries to attract investors into certain locations, and guarantees may also be provided by Governments for loans taken by the investor. Cases of Governments "on-lending" concessional loans obtained from development partners to investors that are not paid back are common, and must be checked through improved coordination among Government agencies and the effective monitoring of such facilities for early detection and the prevention or mitigation of default.

Regulatory incentives

Regulatory incentives comprise benefits to investors in the form of exceptions to regulations or allowances in the application of regulations. Such derogations may be provided in laws (e.g. laws establishing free trade zones), investment treaties (as well as double taxation agreements and free trade areas) or stabilization clauses in investor-State agreements (ibid., p. 31), and have typically covered a range of issues, including environmental and labour regulation, legal protections, dispute resolution, fiscal issues and the exercise of discretion. Regulatory incentives are widely used by developing countries to give advantages or benefits to investors outside the existing regulatory regime.

It has not been clearly established, however, whether these incentives have led to increased investment or are beneficial at all, especially when they involve lowering environmental or labour standards for investors. What is clear is that a regulatory regime that is fair, transparent and predictable, and that guarantees the protection of property rights, is more likely to ensure and sustain investments (ibid., p. 32). Regulatory incentives in the form of local content laws may be considered. Local content laws require mining entities to procure all or a certain percentage of inputs locally and stipulate penalties or fines on companies for breaching those laws. The incentives could also be in the form of providing relevant information or

analyses or establishing a dedicated government unit to facilitate investments in local content industries.[69] It is also important for countries to factor in the impact of any investment laws, treaties and international agreements in the negotiation of investment or mining agreements, to avoid duplicative, excessive or contradictory incentives.

3.1.3. Regional instruments and strategies to promote optimization

"The role of regional cooperation and integration in reducing transaction costs, establishing intra-regional synergies, enhancing competitiveness and realizing economies of scale that would catalyse minerals cluster development should not be underestimated. However, for goods, services, capital and other factors to freely flow in the regional spaces, there is need to expedite intra-regional harmonization of laws, regulations and fiscal regimes, among other critical factors" - Africa Mining Vision

The Africa Mining Vision recognizes that harnessing natural resources effectively is key to the development of Africa, and that regional cooperation and integration are essential to facilitate the factor flows necessary to optimize development of the continent's natural resources (African Union, 2009, p. 4). Some of the instruments and strategies that can be employed to facilitate factor flows within regional economic communities or among countries are discussed below.

3.1.3.1. Common external tariffs

A common external tariff is a policy by a group of countries in an economic union, (typically a customs union such as some of the regional economic communities) to adopt or apply the same customs duties or non-tariff barriers, such as import quotas, to goods entering the union or region. It is useful as a strategy to protect local industries (especially import-substitution industries) or to prevent smuggling or re-exportation.[70] Customs duties facilitate the development of linkage industries by imposing higher tariffs on imports of inputs. Similarly, import quotas can restrict the quantities of certain goods imported into a region in order to promote the development of local substitutes. Licensing is another non-tariff measure. At the same time that a common external tariff creates a large market that enhances economies of scale and is lucrative for investments, any negative impact can be addressed through protection measures that ensure that countries within a bloc or region with specific needs are protected. Even though the cement sector has its own challenges, including protectionism with regard to local cement industries and non-compliance with common external tariff regimes by countries within trade blocs, Dangote Cement is an example of a mineral (limestone) linkage industry that has taken advantage of common external tariffs and lower intraregional trade tariffs to develop fully integrated clinker and cement production in West Africa and other regions of the continent.[71] The benefits for countries of the economies of scale obtained by the company

[69] E.g. to facilitate business registration.

[70] A situation in which countries within a trade bloc or region use lower tariffs to import goods, only to export them to other countries within the bloc or region tariff-free.

[71] Dangote Cement is a fully integrated quarry-to-customer producer which had a production capacity of up to 45.6 million tons per annum across Africa as at the end of 2017, and is the continent's leading cement producer (see www.dangotecement.com/nigeria-operations). From operating a number of plants in Nigeria, Dangote Cement has since 2015 established cement facilities in Cameroon, the Congo, Ethiopia, Ghana, South Africa, Sierra Leone, the United Republic of Tanzania and Zambia (see also Global Cement, 2018). The Economic Community of West African States (ECOWAS) common external tariff on cement is 35 per cent, on clinker 25 per cent and on limestone 20 per cent.

include lower cement prices to boost regional and local infrastructure development and the development of linkages or integrated industries (Byiers, Karaki and Vanheukelom, 2017).[72] For instance, Heidelberg (a major cement producer in West Africa) which has until now imported clinker for its plants in the region is considering sourcing limestone locally for clinker production.[73]

3.1.3.2. Spatial development initiatives

Spatial development initiatives are a development strategy that utilizes the infrastructure and economic factors within a specific geographical region to stimulate economic development and the growth of local industries and businesses in that region. Normally, this is facilitated by a transport route or development corridor linking key hubs. Through the transport route, the development corridor generates clusters of economic activity along the route that reinforce each other and foster further economic development. Apart from transport, development corridors can also be promoted based on trade and industries, such agriculture, manufacturing and mining. A key characteristic of development corridors is their potential to facilitate a wide range of economic activity. They are therefore defined by economic potential rather than political boundaries. The Maputo development corridor developed between Mozambique and South Africa in 1996 is widely considered to be successful (African Development Bank (AfDB), Organisation for Economic Co-operation and Development (OECD) and United Nations Development Programme (UNDP), 2015, p. 180). The corridor comprises roads, railways, ports, border posts and terminal facilities, which connect industrial, mining and agricultural areas in South Africa with ports on the Mozambique coast.[74] The Africa Mining Vision also favours spatial development initiatives, with natural resources-based development corridors as the preferred approach to the development of regional linkages, and identified 13 potential resources-based development corridors on the continent (Africa Mining Vision, 2009, pp. 44–45). Such development corridors will rely on a mine- and mining-related infrastructure, including roads, rail, ports and energy infrastructure, to stimulate economic linkages (upstream, downstream and sidestream) with other sectors of the regional economy, including agriculture, manufacturing, forestry, tourism, services, technology and logistics. While development corridors present significant opportunities for maximizing benefits from the development of mineral resources, their success depends on deliberate and careful planning, including extensive community and stakeholder engagement to determine feasibility and engender interest and ownership. Such planning must often take place before the mining agreements are signed, so that the mine and other infrastructure are linked effectively within the development corridor. Another critical success factor is the densification of relevant infrastructure within the corridor (Jourdan, 2008). This can be done by the Government or the private sector, especially through resource rents. Other issues that must be addressed include potential social impacts, conditions for allowing third-party access, the determination of appropriate economic use fees, and sustainability, especially after the anchor project (the mine) closes. Since such projects usually straddle political borders, issues such as coordination, risk- and benefit-sharing, the applicable legal and regulatory regime, taxation, and dispute- or conflict-resolution mechanisms ought to be considered and addressed objectively among the parties.

[72] In 2015, Africa became the fastest-growing market for cement in the world, largely on account of Dangote Cement (see Centre for Affordable Housing Finance in Africa, 2015).
[73] "The new clinker plant in Togo will greatly improve our competitiveness by enabling us to replace expensive clinker imports by local sourcing" (Beumelburg, 2015).
[74] See www.portmaputo.com/maputo-development-corridor.

3.1.3.3. Regional strategies to improve investment and trade

Various other strategies can be employed at the regional level or among countries to enhance the benefits from mineral resource projects. Some of these strategies involve removing barriers to trade or restrictions on the free movement of goods, services, capital and persons within the region. Since these factor flows are relevant to creating large regional markets which promote economies of scale and lower production costs, any restrictions on them can have a negative impact on revenues or profits. Common restrictions include customs duties (tariffs) and non-tariff restrictions such as the requirement of import and export licences, import quotas, subsidies, local content requirements, currency devaluations, embargoes, trade restrictions and voluntary export restraints. Strategies to improve governance (e.g. customs processes, port administration and border control), build the capacity of regulatory officials, develop connecting infrastructure (e.g. roads, and information and communications technology) and share information will also contribute to lower costs of doing business within a region.

Other regional strategies that may be pursued include the development of regional supply chains, regional markets and feedstocks for regional industries. Their success depends, however, on some of the strategies discussed in the above paragraphs. Accordingly, any strategy must be informed and guided by relevant studies and plans, including global realities. Such strategies may also require difficult negotiations among countries and the exercise of political will to implement them. Some countries may lose some domestic industries or revenue streams in the short term in order to enhance regional integration or develop long-term regional supply chains. It is also important that an appropriate regulatory framework be adopted, such as one that includes regional agreements or new or harmonized regulatory regimes, and that the required capacity be developed to implement the strategies.

3.1.3.4. Regional cooperation and integration

"A knowledge-driven African mining sector that catalyses and contributes to the broad-based growth and development of, and is fully integrated into, a single African market …" - Africa Mining Vision

Competition regarding incentives has not been effective in generating or optimizing benefits from mining for African countries (United Nations, ECA, and African Union, 2010, p. 17). One way to address this is through regional cooperation and integration. As noted in the report of the International Study Group (ibid., p. 154), "Regional cooperation and integration provide opportunities for sharing development capacities and abet the movement of factors of production across borders. In addition, policy harmonization provides resistance to, and can even reverse, the 'race to the bottom' — a prominent feature of the competition to attract foreign mining investment." While some countries have so far gone through various country mining vision processes to align their mining policies to the Africa Mining Vision, the impact of harmonization has not been fully realized, as most countries or regional economic communities have yet to review their mining regimes to give effect to the harmonized policies (Afeku and Debrah, 2019).[75] A key step in this regard is the regional mining vision process, which will

[75] Afeku and Debrah (2019) recommend harmonizing the Africa Mining Vision with subregional policies, such as the ECOWAS Mining Directive and its Mineral Development Policy, to facilitate regional exploitation of development minerals.

facilitate the regional harmonization of policies and laws for the optimization of benefits (United Nations, ECA, and African Union, 2010, p. 154).[76]

Countries or regional economic communities can also pursue joint projects or mineral-related activities for their mutual benefit, including partnerships for the development of linkages, and mineral-related research, innovation and training. Under the Treaty for the Establishment of the East African Community, for instance, partner States agree to cooperate in the joint and efficient management and sustainable utilization of natural resources for their mutual benefit and to promote joint exploration,[77] efficient exploitation and sustainable utilization of shared mineral resources (East African Community, 1999, art. 114 (2) (c) (ii)). It is expected that realization of the African Continental Free Trade Area would present further opportunities for countries to develop effective partnerships for the optimization of mineral value chains. In particular, the harmonization and coordination of trade liberalization and facilitation regimes and instruments across regional economic communities and Africa, and the exploitation of opportunities for scaling up production and access to a continental market, as well as better reallocation of resources, should spur the development of many linkage industries. For instance, joint linkage projects can be structured to utilize the mineral deposits of one country or region, the consumption or processing know-how and facilities of another country and the infrastructure (e.g. ports) of yet another country (Africa Mining Intelligence, 2019). The combined wealth of a region's mineral resources can be significant for the development of strategic and competitive regional industries and value chains, as well as support infrastructure, within designated development corridors. Examples of successful joint projects exist in other sectors such as the oil and gas, energy, banking, trade, security and tourism sectors.[78] Elsewhere, where natural resources straddle international borders or countries seek to develop a common resource optimally, tools that have been employed to manage the relationship between the countries include unitization,[79] joint development zones[80] and treaties.[81] The lessons learned from these experiences should be useful in determining optimal mechanisms for cooperation or coordinated development among African countries. Institutions like the African Legal Support Facility exist to support countries with the legal and technical expertise required to structure such complex transactions.[82]

[76] National and regional processes will need to be aligned and brought into conformity with the aspirations contained in the Africa Mining Vision. The Southern African Development Community (SADC) region comprises 16 countries that are highly dependent on their mineral sectors and have agreed to adopt a regional approach to mineral development to optimize the benefits from mineral extraction. The approach is underpinned by a regional mining vision which is anchored on the tenets of the Africa Mining Vision (United Nations, ECA, and African Union, 2010, p. 154).

[77] Especially partnerships in exploration and data-sharing, as artificial borders do not limit the geology of neighbouring countries.

[78] E.g. the West Africa Gas pipeline project, the Chad-Cameroon pipeline project (International Finance Corporation, 2003) and the SADC Integrated Regional Electronic Settlement System (see SADC, 2015).

[79] E.g. between Australia and Timor-Leste, and in joint North Sea developments between Norway and the United Kingdom of Great Britain and Northern Ireland (Bastida and others, 2007; and Kemp, 1990, pp. 599–623).

[80] E.g. the Nigeria-Sao Tome and Principe joint development zone (Groves, 2005; and Biang, 2009).

[81] E.g. the treaty between Argentina and Chile on mining development, which provided for the harmonization of regulations for cross-border mining activities in the Andean border region between the two countries, including with regard to issues of taxation, customs, labour, social security, environmental management and international boundaries. The parties agreed to establish a special administration committee comprising officials of the foreign affairs and mining ministries of both countries to coordinate activities between the two States parties and investors. The Committee evaluates mining investment proposals submitted by investors and makes recommendations to the States parties for implementation of special mining protocols for development of the project. The special mining protocols generally incorporate the terms of the Mining Development Treaty, but include specific issues related to the particular circumstances of each project (Bauni, 2004).

[82] See https://alsf.afdb.org/who-we-are/statutory-documents/treaty-establishing-the-ALSF.

Regional cooperation and integration can also enhance the benefits of mining through collaboration in the prevention of the illegal mining and transit of minerals, and through initiatives related to combating smuggling and to conflict minerals. For example, the International Conference on the Great Lakes Region Protocol on the Fight against the Illegal Exploitation of Natural Resources enjoins member States to work in concert to address issues of illegal exploitation of natural resources through a tracking and certification system within the Conference's jurisdiction. Such initiatives ensure that countries capture the full value of minerals extracted and stem revenue losses from illegal mining and trading, as well as limit the incidence of using minerals to fund conflicts, whose costs are incalculable and retard development. While the importance of tracking and certification mechanisms and other such initiatives cannot be monitored, modest measures such as improvements in governance, information-sharing and the enforcement of laws and regulations can be effective in preventing the issues in the first place, thus avoiding the costs associated with implementing these initiatives, especially systems or initiatives that are based in other countries.[83]

3.2. Artisanal and small-scale mining and development minerals for the optimization of benefits

Artisanal and small-scale mining is widespread in many countries, but such operations are often inefficient (United Nations, ECA, and African Union, 2010, p. 68). This type of mining is also associated with destruction of the environment and poor health and safety standards. However, reforms in the artisanal and small-scale mining sector could potentially transform a country's mining sector and maximize the benefits from mining, since the bulk of revenues from such mining are retained and invested in the local economy (see box 12).[84] With the implementation of relevant policies and strategies,[85] effective linkages can be more readily developed with artisanal and small-scale mining operations, including the development and manufacture of efficient mining techniques and equipment, the supply of mining inputs and the local consumption or utilization of the minerals extracted by such mining.

[83] E.g. the Kimberley Process certification scheme, the Dodd-Frank Wall Street Reform and Consumer Protection Act of the United States and the International Tin Supply Chain Initiative.

[84] The contribution of artisanal and small-scale mining to total mineral production in Africa is substantial. For example, it constituted about 35 and 40 per cent of total gold production in Ghana in 2017 and 2018, respectively (see Ghana, 2019). For information on the contribution of artisanal and small-scale mining to mineral production in Burkina Faso and Côte d'Ivoire, see *Global Business Reports*, 2019.

[85] For policy suggestions, see United Nations, ECA, and African Union, 2010, p. 79. One policy provides for promoting subregional cooperation in technology development, research, construction of appropriate plant and machinery, technical standards, compilation of a database of local capacity and generation of financial resources.

Box 12

Zimbabwe artisanal and small-scale mining support triangle

- Artisanal and small-scale mining production in Zimbabwe has sometimes surpassed large-scale production
- In 2004 and 2005, respectively, such mining produced 60 per cent and 50 per cent of the total gold produced in Zimbabwe
- The country's artisanal and small-scale mining support triangle was relevant to the high production levels and considered a model for development of the sector
- The support triangle comprises the following:
  (a) Finance and credit: the Government funded the purchase or hiring of mining and processing equipment through a mine mechanization fund;
  (b) Extension services: the Government provided extension services for technical assistance to miners;
  (c) Marketing: a ready market for the minerals produced was assured by a subsidiary of the Reserve Bank of Zimbabwe, which bought all the gold and silver produced. Brokers bought other minerals;
- In the Shamva area, the Shamva Mining Centre was established to provide various services to about 40 small-scale gold miners. The Centre supported the miners with mining tools and equipment, access to efficient processing facilities, and advice on a range of subjects, including geology, finance, mining methods, the use of explosives and the health, safety and environment. The success of the Centre resulted in other entrepreneurs replicating it in other mining areas across the country
- The ready availability of minerals facilitated the development of downstream linkages, e.g. jewellery, pottery and stone carving, for the domestic and regional market.

Source: https://knowledge.uneca.org/ASM/zimbabwe.

Development minerals also present unique opportunities for enhancing the benefits from mining because such minerals or their derivatives can be consumed or utilized in local industries, such as construction, manufacturing and agriculture. For bulk minerals, significant savings can be made on transportation costs by processing the minerals locally before export. They can also be utilized locally or in the manufacture of other products. The local manufacture of goods that would otherwise be imported (import substitution) leads to a reduction of the import bill, industrialization and job creation, among other things. Examples include the utilization of limestone in cement production; clays in building and construction, ceramic and ornamental products; kaolin in cosmetics and paint production; silica in foundries and the construction and chemical industries; iron in steel manufacturing; and phosphates in fertilizer manufacturing. As noted above, continental and regional policies can enhance the benefits of development minerals to local producers and users alike.

3.3. Addressing the factors that hinder benefit optimization

Corporate practices that have an adverse impact on government revenues or benefit optimization include tax evasion and tax avoidance practices like transfer mispricing, ambiguous permanent establishment, base erosion and profit-shifting practices, hedging, thin capitalization and trade misinvoicing. Other corporate practices such as retention in offshore accounts of all or most of the foreign exchange receipts from the sale of minerals and the uncontrolled repatriation of profits limit the availability of foreign exchange in the host economy, which contributes to macroeconomic challenges such as high interest rates and low investment, including in mineral linkage industries. Some government practices can also limit benefit optimization,[86] such as bilateral investment treaties or mineral development agreements that exempt investors from technology transfer requirements, permit total retention of revenues abroad or the unlimited employment of expatriates, grant excessive investment protections or result in lopsided dispute resolution terms (Boone, 2011). Yet, other factors not necessarily attributable to companies or Governments may be unfavourable, such as commodities without defined reference prices, even though companies can take advantage of this to fix lower prices to reduce their tax liabilities.

3.3.1. Tax avoidance

Unlike tax evasion, which involves breaches of tax laws or non-payment of tax, tax avoidance practices do not necessarily breach any laws even though they are intended to avoid or minimize tax liability through certain schemes or the exploitation of loopholes in the law. Tax avoidance mechanisms are prevalent and difficult to detect because the multinational companies involved in such practices operate across different tax jurisdictions with varying regulatory interests and capacities. For instance, a company incorporated in a tax haven may be designated as a supplier of certain (factitious or overpriced) goods or services in order to shift profits from a host country to the tax haven and avoid paying the host country taxes. Also, a transaction could be between legitimate parties, but the parties can fix the amount involved in the transaction in such a manner as to shift funds from an account in one country to an account in another country to avoid paying taxes (an example of transfer mispricing). Again, companies may be financed by their high equity-financed affiliates in lower-tax jurisdictions at disproportionately higher levels of debt relative to equity so that interest or debt-servicing payments (which are tax deductible) can be used to shift funds or profits to affiliates that are owned by the same shareholders (an example of thin capitalization). Companies may also create or exploit ambiguities in the permanent establishment or jurisdiction of tax liability to avoid paying the appropriate taxes in the host country through base erosion and profit-shifting strategies. In all these cases, Governments are denied a fair share of revenue from the exploitation of their mineral resources (Africa Progress Panel, 2013; and United Nations, ECA, 2017).

While tax avoidance practices are undertaken in all jurisdictions, companies are more likely to succeed in limiting their tax liabilities in countries with weak or inflexible tax administration systems. Tax authorities will have a good chance of detecting or preventing tax avoidance schemes if they know how much tax is realizable and put in place measures to guarantee payment, such as measures to limit profit-shifting practices through enforcement of the arm's length principle, and fixed debt-to-equity and earnings-stripping rules. Most countries now have anti-transfer pricing laws and typically stipulate arm's length principles that provide

[86] For instance, concluding bilateral or multilateral investment agreements that contain provisions that are counterproductive to a country's benefit optimization strategies or its policies on revenue maximization and linkages, or industrialization.

that the price of exchange of goods or services between affiliated entities should be the same as if the two entities were independent of each other (OECD, 2019, art. 9). Nevertheless, as the Africa Progress Panel report on these issues shows, having anti-transfer pricing laws does not necessarily stop the practice, especially when Governments do not have a reliable reference or comparable price for the goods or services being exchanged. For such laws to be effective, there should be sufficient transparency and reporting on the transactions, along with knowledge and information about similar transactions or exchanges. One way to achieve this is to develop a system for information-sharing among countries producing similar minerals. This will ensure that countries have enough information to reasonably estimate prices for taxation purposes or to detect transfer mispricing activities. Among other things, the African Union and ECA High-Level Panel on Illicit Financial Flows from Africa has recommended an automatic exchange of tax information among African countries, as well as from other countries in the world, especially home countries and jurisdictions hosting multinational companies (United Nations, ECA, 2015, chap. 5.A.3).

Meanwhile, measures such as fixed debt-to-equity rules and earnings-stripping rules can be employed to control excessive debt financing for the purpose of interest deduction for profit-shifting. While fixed debt-to-equity rules stipulate a ratio to limit the extent of debt financing or thin capitalization, earnings-stripping rules limit the extent of interest deduction by stipulating the range (typically between 10 and 30 per cent of a company's earnings before interest and taxes or earnings before interest, tax, depreciation and amortization) of allowable interest deductions between related companies. There are concerns, however, that these rules, especially thin-capitalization rules, prevent companies from raising financing from affiliates at a cheaper cost than on the debt market. Thus, earnings-stripping rules appear to allow companies to borrow anywhere cheaply, even from affiliates where possible, but limit the interest payable to control profit-shifting. Thin-capitalization rules are general in application, while earnings-stripping rules are targeted at the problem of interest deduction by restricting interest payments to allowable limits. Here, too, comparable information is important in determining whether interest payments are excessive so that companies are not unduly denied financing for their operations, which must thrive for the Government to take its fair share.

3.3.2. Hedging

Mining companies originally entered into hedging agreements to reduce or transfer risks of substantial losses, including foreign exchange losses.[87] This was done through forward sales of minerals at guaranteed prices. However, as this arrangement is largely speculative, it can also lead to massive gains for companies when future mineral prices fall considerably below the guaranteed or hedged price. While Governments are content to benefit from the hedging gains made by companies, they are less eager to participate in the losses. Many African countries lack the capacity to administer their tax regimes effectively, let alone manage or promote risky schemes like hedging. Nevertheless, that does not stop some companies from engaging in the practice and putting the mining operations and government revenues at risk in the process. At a minimum, to the extent that the transaction goes beyond the normal or expected course of business,[88] companies must be required to disclose such transactions. Countries may prohibit them altogether or require that prior approval be sought before such transactions can be completed, if there is capacity to evaluate the impacts, especially on the country. The nature of international finance today means that such agreements may be used to

[87] Even though the international markets offer an extensive range of derivative transactions that are based on commodities and stocks held by mining companies.

[88] It may be argued that derivatives trading is within the normal course of international business transactions. Thus, this would have to be addressed in appropriate legislation or in mining contracts.

finance investment in or acquisition of mines, and countries may not always have control over such transactions. To ensure that countries benefit from hedging gains while limiting any potential losses, it must be stipulated categorically that companies would be liable to taxes based on international published reference prices at the time of the transaction or on the hedged price, whichever is higher. In any case, given the inevitability and complexities of transactions like this, Governments must invest in relevant capacity and the regulations needed to ensure that the most reasonable decision is made in the interest of their countries.

3.3.3. Illicit financial flows

According to the report of the High-level Panel on Illicit Financial Flows from Africa, illicit financial flows are monies that are illegally earned, transferred or utilized, and typically originate from: (a) commercial tax evasion, trade misinvoicing and abusive transfer pricing; (b) criminal activities, including the drug trade, human trafficking, illegal arms dealing and smuggling of contraband; and (c) bribery and theft by corrupt government officials. The African continent's dependence on the extraction of natural resources makes it vulnerable to illicit financial flows, which account for an estimated loss to the continent of $50 billion to $60 billion a year. When contrasted with the $68 billion to $108 billion required to finance the continent's infrastructure gap (AfDB, 2018) and the impact the money lost would have had on benefit optimization, it is clear that the importance of stopping the illicit flows cannot be overstated. Such flows thrive because of poor financial regulatory frameworks, weak tax regimes and enforcement of tax laws, opaque international trade systems and multinational criminal networks. The Panel recommends, among other things, enhanced regulation, better data collection and sharing, the establishment of transfer pricing units with considerable powers to obtain relevant information, increased transparency of the international financial system, collaboration between countries, beneficial ownership registration and declarations, use of the African tax Administration Forum model double taxation agreement and institutional capacity-building (United Nations, ECA , 2017, pp. 80–82).

3.3.4. Environmental costs

Environmental issues are important and must be addressed in a comprehensive manner, as provided under a strategic environment and social impact assessment, because they can diminish the value or benefits a country derives from mining. Actual environmental and social impacts and costs are not easy to determine accurately, and countries lack the capacity to do so. There are, however, objective means of assessing the impact of mining operations on the environment and estimating the costs of reclamation, rehabilitation, compensation and resettlement, where necessary. Countries can then make the appropriate inputs into their financial models to determine the net benefit of a mining operation. If mining is sanctioned, appropriate measures must be taken to mitigate the impact on the environment. Many countries still have yet to include community development requirements and climate change issues in their environmental regulations, and this must be done in accordance with current international standards. Mechanisms for financial assurance of environmental obligations often include agreements requiring the posting of bonds or escrow payments to fund rehabilitation programmes during mining and after mine closure. It is also important to review the track record of mining companies in relation to environmental compliance, and to verify the insurance provided by the companies to mitigate any eventualities. It is not uncommon for companies to file for bankruptcy or to transfer their mineral rights to new entities in order to avoid environmental obligations. Understanding and spotting such behaviour by companies can elude even highly trained experts. However, disregarding such issues altogether is imprudent. At the very least, countries must conduct due diligence, enforce reporting obligations and ensure effective monitoring to limit such occurrences.

4. Legal provisions and benefit optimization

In the present section, a number of provisions of mining laws or contracts that can have an impact on benefit optimization, other than those previously considered in the present guide, are discussed. Where necessary, some of those issues are examined either to address aspects not fully considered earlier or to emphasize certain issues. In some cases, innocuous or boilerplate provisions and their implications for benefit optimization are highlighted. For further or more extensive discussions of and reference to provisions of mining laws and contracts generally, the guiding template of the African Mining Legislation Atlas is recommended (see box 13).[89]

Box 13
African Mining Legislation Atlas guiding template

The African Mining Legislation Atlas guiding template is a reference tool that provides guidance on typical and potential issues that are or ought to be covered in a mining law, based on the circumstances in Africa.

The topics addressed in the guiding template include:

- Definitions and interpretation
- Scope of the law
- Effect of the repeal or amendment of prior law
- Reference to other laws
- Ownership of mineral resources
- Ownership of geological data
- Prohibited areas
- Transparency
- Confidentiality
- Anti-corruption
- Use of security forces
- Implementing regulations
- Regulatory bodies
- Cadastral systems
- Licensing procedures
- Reports and reporting
- Dispute resolution
- Force majeure
- Mineral rights
- Value addition
- Fiscal terms (including taxes, State equity participation, stabilization, incentives, transfer pricing and foreign exchange)
- Environment
- Other natural resources
- Local development (including infrastructure use, local content and community development agreements)
- Labour
- Health and safety

Source: https://a-mla.org/en/guidingtemplate.

[89] See https://a-mla.org/en/guidingtemplate.

4.1. Parties

The parties in a mining contract are the Government and the mining company. Depending on the regulatory regime, the Government is typically represented by the minister responsible for mines or finance, the State mining company or a relevant government official or agency authorized by law. Most regimes require the investor to be an incorporated entity to ensure that it is subject to relevant corporate laws and regulations. In the oil and gas sector, where unincorporated joint ventures are common, elaborate agreements are drawn up to regulate the relationship between the parties and their rights and obligations, especially in relation to the host country. One disadvantage to accepting unincorporated parties or non-locally incorporated parties is that local laws and provisions, including local dispute resolution provisions, may be limited in their application to such entities. Some countries, however, waive local incorporation requirements for exploration companies to attract investment and facilitate fundraising for exploration. Nevertheless, local incorporation may be necessary for the effective monitoring or regulation of exploration expenditure, tax avoidance practices and illicit financial flows.

4.2. Contract area and duration of rights

Granting mineral rights over large areas and for a long period of time makes it difficult for Governments to derive optimum benefits from mineral operations. Apart from resource rent taxes that can rise and fall in accordance with the cyclical nature of natural resources operations and distribute revenues fairly between the Government and the investor, Governments may consider restricting contractual areas to a maximum area based on the investor's technical and financial capacity, up to a stipulated maximum, and limiting the duration to the period required at a given rate of mining, also up to a stipulated maximum (typically between 25 and 30 years in current mining laws). Other ways to curb speculation include relinquishment ("use it or lose it") mechanisms such as an escalating fee regime (Aryee, 2018).

4.3. State participation

As this aspect has been discussed previously, it suffices to add that dividends arising from State equity participation are an additional source of revenue for Governments and are typically payable from a company's profits. As these payments are derived from the profits of a mining project, they have been characterized by some as a form of resource rent tax, or indirect tax (Otto, 2018, pp. 288–290). When a Government decides to participate in a mining project beyond its carried interest, its decision must be based on a sound evaluation and analysis of the risks and rewards to the country. Beyond the mining contract, consideration should be given in shareholders' agreements to issues surrounding the dilution of the Government's stake, representation and minority rights. The Government may consider taking preference shares instead of ordinary shares to guarantee earlier rights to the payment of dividends, or seeking representation on the board of the mining company on account of its equity interest. Governments must also determine the best way in which the country's interests can be represented on mining company boards. Countries can provide guidelines or a code of conduct for government-appointed directors of such boards, or stipulate that the shares be held by accountable State-owned commercial entities with good corporate governance practices. Appointing regulatory institutions to hold the State's equity would be counterproductive.

4.4. Stabilization clauses

Stabilization clauses may be in the form of freezing clauses or economic equilibrium clauses, or both. The former are generally required by investors to restrict the application of new laws to the investor for a certain duration. More specifically, fiscal freezing clauses protect the investor against adverse changes in the fiscal regime, such as those related to royalties, taxes, customs duties and exchange control laws. Economic equilibrium clauses do not restrict changes in law but do require the investor to be compensated for any adverse impact caused by a change in law or the fiscal terms of the project, such as through rebates, adjusted tariffs, lease extensions or tax reductions.[90] The rationale is that mining is a high-risk and capital-intensive business, and that investors and lenders must be assured of a stable legal and fiscal regime to minimize risk and guarantee a good internal rate of return. If a stabilization clause is to be granted, key considerations should include what types of taxes are to be stabilized, whether the bases of taxation are being stabilized, whether new taxes are included, the duration of the stabilization regime and the capacity and cost of administering it (ibid., p. 291). Countries with stable investment regimes and good governance credentials should be able to negotiate the exclusion of stabilization terms. Moreover, it is not good practice to stabilize the entire legal regime, including environmental laws, labour laws and human rights laws. Economic equilibrium clauses that allow the Government and the investor to review their respective economic positions after any changes in law and to rebalance their rights and obligations offer a good compromise. If stabilization clauses are maintained, countries must derive optimum benefits for the guarantees provided, such as by setting a threshold level of investment to qualify for stabilization or requiring significant local content or economic linkage commitments from the investor. It is also good practice to subject stabilization regimes to periodic review in case any material changes warrant the renegotiation or amendment of the stabilization provisions.

4.5. Review

Investors prefer stability and are wary of renegotiating mining agreements, especially when it leads to changes in the agreement that affect payback. At the same time, Governments are disadvantaged by long-term contracts that do not deliver the desired benefits owing to the fact that the circumstances that existed at the time of the agreement have changed. These changes could also affect the investor. Thus, both parties are likely to agree on a provision that enables them to reconsider the terms of the agreement in view of changes in circumstances. Generally, these contract reviews should not be overly wide-ranging, so as to allow for a fair degree of certainty, and the changes should be clearly defined as those that affect the fundamentals of the agreement, such as changes in pre-existing conditions that affect the overall balance of equities and benefits reasonably anticipated by and between the parties. Other options include requiring the parties to meet every five years to determine whether there have been any fundamental changes in circumstances and, if so, whether to renegotiate the affected provisions. For a sample review clause in a mining contract, see box 14.

[90] Columbia Centre on Sustainable Investment, “Stabilization clause”, Negotiation Support Portal for Host Governments Glossary database. Available at https://negotiationsupport.org/glossary/stabilization-clause.

Box 14

Sample review clause in a mining contract

Periodic review

X.1 The Government and the Company shall, at the request of the other Party, consult together for the purpose of considering whether a profound change in circumstances has arisen since the effective date or the date of the most recent review of this Agreement.

X.2 The Parties shall meet to review the matter raised as soon after the request as is reasonably convenient for them both in order to determine if a profound change in circumstances is established to have occurred but in any case no later than [21] days after the request.

X.3 To the extent that a profound change in circumstances has occurred, the Parties shall enter into good faith discussions to consider such change in or clarification of this Agreement as they may in good faith agree is necessary, provided that it is agreed by the Parties that such good faith discussions shall not require a Party to agree to any modification of this Agreement.

X.4 The Parties shall effect such modifications to this Agreement as the Parties agree are necessary.

X.5 For the purposes of this Agreement, profound changes in circumstances shall mean such changes in the economic conditions of the [gold] mining industry worldwide or in the country, or such changes in the economic, political or social circumstances existing in the country or elsewhere in the world at large, as to result in such a material and fundamental alteration of the conditions, assumptions and bases relied upon by the Parties at the effective date (or at the time of the last review under this clause) that the overall balance of equities and benefits reasonably anticipated by them will no longer be achievable as a practical matter.

X.6 In addition to the consultation provided by clause X.1, each Party may at any time request a consultation with the other Party with respect to any matter affecting the rights and obligations of the Parties under this Agreement or any matter relating to operations. The Parties shall meet to review the matter raised as soon after such request as shall be reasonably convenient for them both. Subsequent to the consultation, the Parties shall take the action, if any, that is mutually agreed to address the matter.

Source: Redrafted from a Ghanaian mining development agreement.

4.6. Dispute resolution

Dispute resolution provisions ensure that when parties have disagreements, they can follow certain processes to ensure an effective settlement; otherwise, uncertainty in dispute resolution can be costly for the parties. Investors prefer international dispute resolution mechanisms to local or domestic systems, as they consider that the international system is confidential and more neutral, that it involves arbitrators who are experts and that the decisions are final and enforceable. At the same time, Governments have expressed discontent with the

outcomes of international investor-State dispute settlement mechanisms owing to unsatisfactory awards, the non-selection of African arbitrators and unfair processes. In addition, many Governments may have capitulated to the international mechanisms, including bilateral investment treaties, to attract investment but still lack the stable legal and judicial systems and reliable governance frameworks required to give confidence to investors. A concerted effort is required to resolve these issues. Governments ought to provide or negotiate clear and robust dispute resolution provisions to minimize the incidence of disputes and enhance their effective resolution.

Some of the considerations for minimizing disputes include improving compliance with the Government's obligations and the terms of the agreement generally, ensuring consistency between laws and contracts and governmental actions applicable to mining, and providing for mediation to resolve teething issues. To facilitate the effective resolution of disputes when they arise, dispute resolution provisions must clearly set out which disputes are to be referred to international arbitration or to local dispute resolution processes and stipulate that local remedies must be exhausted before any escalation of a dispute to international forums, especially where local dispute resolution systems are independent and reliable, and uphold the rule of law.

4.7. Governing law

For the avoidance of doubt, the governing law of the contract or the law to be applied to the terms of the contract must be clearly stipulated in the contract. This is usually the law of the country, since the mineral right or the land in which the object of the contract is found lies within the country's jurisdiction. It would be abhorrent to justice and good conscience if the governing law of the contract were any law other than that of the country. Some governing law clauses include language to the effect that relevant or general principles of international law will apply to the contract. The risk of such a provision is that it opens the contract up to the inclusion of international law principles or norms that may be detrimental to the country's interests. The laws of a country include the principles of international law that the country takes the appropriate steps to ratify or incorporate into its national legislation.

4.8. Access to information and confidentiality

Confidentiality and access to information provisions in a mining contract establish the issues or information that require confidential treatment by the parties and the protocols that enable the public to obtain information on the mining project. Companies listed on stock exchanges prefer to keep certain information confidential until it is due for filing or public release, due to the sensitivity of stock markets to such information, especially if it relates to exploration data, reserves and resource positions, intellectual property and financial transactions. Governments (especially as they may also be shareholders) recognize the importance of preserving the value of listed companies, but must balance this against the public's right to information and the requirement for transparency in the management of extractive resources. Therefore, the contract must stipulate clearly which information must out of necessity be confidential (such as information that companies protect from competitors) and which ought to be published or made accessible to the public, such as information on the mining contract and the revenues paid to the State.

4.9. Ownership of geological data

Ownership of geological data is typically vested in the State or the grantor of the mineral right. To facilitate the mining operations for the mutual benefit of the parties, reports, geological and geophysical data, maps and other work products prepared or developed by the mineral rights holder in the performance of activities under the mining contract are deemed to be the property of the holder during the term of the contract. Thus, the holder has use rights, while the State remains the ultimate owner of the data. These use rights may include rights to transfer the data to potential assignees, albeit often subject to the approval of the State.

4.10. Transfer of skills and technology

The obligations imposed on mineral rights holders to transfer technology and skills to the host country are predicated on the strategies utilized successfully by developed countries for their industrialization, such as the use of tariffs, subsidies, export restrictions and performance requirements, and the exploitation of intellectual property (United Nations, ECA, and African Union, 2010, p. 116). Today, international agreements have reduced the scope for employing such strategies, including those imposing performance requirements on foreign investors to transfer skills and technology to the host country.[91] Despite these constraints, the Africa Mining Vision advocates the negotiation of skills and technology transfer requirements in mining contracts in accordance with the Vision in order to create a knowledge-driven, diversified and globally competitive mining sector that is a key component of an industrializing African economy. Countries are therefore required to develop and promote research and development and human resources development through increased funding and effective incentives regimes.[92] Some mechanisms that can be negotiated for providing funding for technology and skills development include: (a) contributing a percentage of the mining company's earnings or profits to a designated technology fund; (b) funding postgraduate-level training or skills and the pursuit of PhDs in relevant skills and technology areas; (c) funding university research centres in relevant skills and technology areas; (d) creating an endowment fund; and (e) offering internships. To achieve economies of scale, countries must collaborate and share capacities in research and development at the regional economic community level.

[91] For example, the bilateral investment treaty between Rwanda and the United States prohibits either country from imposing, among other things, technology and knowledge transfer requirements on investments made by investors from either country.

[92] Africa Mining Vision, 2009, sect. IV, bullet point on "Technology/product development (lateral migration)".

Box 15

Requirements under the mining charter of South Africa related to research and development and human resources development

Research and development

(a) A rights holder must spend a minimum of 70 per cent of its total research and development budget on South Africa-based research and development entities. A minimum of 50 per cent of the 70 per cent indicated above must be allocated to South African public academic institutions or science councils;

(b) A foreign supplier must contribute a minimum of 0.5 per cent of its annual turnover generated from local mining companies towards the development of suppliers to be directed to the Mandela Mining Precinct for research purposes.

Human resources development

An amount equivalent to 5 per cent of employees' remuneration must be invested in a stipulated manner, including:

(a) 3.5 per cent on essential skills development activities such as science, technology, engineering and mathematics skills, as well as artisans, bursaries, literacy and numeracy skills for employees and non-employees (community members);

(b) 1.5 per cent towards South African public academic institutions, science councils or research entities for the development of solutions in the areas of exploration, mining, processing, technology efficiency (energy and water use in mining) and beneficiation, as well as environmental conservation and rehabilitation;

(c) The research and development expenditure contemplated in subparagraph (b) above must qualify for the research and development tax allowance;

(d) The skills development and research investments referred to in subparagraphs (a) and (b), respectively, must be apportioned in proportion with national or provincial demographics.

*Source***:** Mining Charter of South Africa, 2018.

5. Cross-cutting issues

Addressing underlying issues related to the aspects described below is necessary for the effectiveness of the strategies and instruments discussed in the present guide for benefit optimization. These aspects are fundamental to the effectiveness of the strategies because, absent their consideration, countries' efforts to optimize revenues and economic linkages may be futile or unsustainable. The main cross-cutting issues discussed below relate to institutions, human capital, mineral-sector governance, and geological and mineral information.

5.1. Institutions

Institutions are important for the development of any country (Faria and others, 2016); without them, countries cannot function effectively. Institutions are necessary to make and implement laws, protect property rights, collect and manage revenues and provide services to the public.[93] The ineffectiveness of institutions in African countries is perhaps the bane of the continent's development and has often led to dreadful consequences, such as wars, owing to poor management of natural resources. Even in countries with well-developed institutions, there has mostly been a focus on facilitating mineral extraction to the detriment of policies for integrating mining, industry and development, as advocated by the Africa Mining Vision.[94] The institutions required for optimum development of mineral resources range from those tasked with the development of geological and mineral information systems to those responsible for mine closure and post-closure administration. The industrialization and developmental objectives of the Africa Mining Vision require the involvement of even more institutions, including non-typical ones that operate across different or various sectors of the economy. For instance, ministries or agencies responsible for industry that have not hitherto regulated or supervised any aspect of mineral operations are critical to the development of economic linkages across the mineral value chain. The range of institutions required to achieve the objectives of the Africa Mining Vision include those that can effectively coordinate the activities of various other institutions located in different organs of government. To ensure effective oversight and policy cohesion and complementarity, the institution that plays this guiding role ought to be situated at the highest possible level of government, such as in the Office of the President, Vice-President or Prime Minister or in a supra-ministerial office (African Minerals Development Centre, 2014). Efforts aimed at institutional reform in developing countries must focus on building capacity to solve problems instead of merely creating new institutions (Buntaine, Parks and Buch, 2017). Deliberate efforts are also required to develop and integrate institutions that will facilitate the development of linkages. To do this effectively, a gap analysis or audit may be required to determine any defects in or challenges to the institutional framework so that a holistic approach can be adopted to make the framework responsive to a country's objectives. In the case of regional strategies, however, it appears that creating appropriate institutions, especially those with a particular focus on specific mineral development projects or integrated mineral development industries, would be pertinent.

5.2. Human capital

Inadequate human resources correlate with the ineffectiveness of institutions (Faria and others, 2016). Human resources contribute indirectly to development through institutions that are responsible for making and implementing laws, protecting property rights, collecting and

[93] "The social, economic, legal, and political organization of a society, i.e. its 'institutions', is a primary determinant of economic performance" (Bennett, Nikolaev and Aidt, 2016, p. 8).

[94] See United Nations, ECA, and African Union, 2010, chap. 10, for more cogent discussions on the subject.

managing revenues and providing public services. This means that human capital does not itself cause development. Thus, unless capacity is developed and harnessed towards a specified end, human capital will remain ineffective in achieving development goals. In this light, to achieve the goals of the Africa Mining Vision, including the optimization of mining benefits, a purposeful approach to capacity-building is required. Just as with institutional development, such an approach must determine the capacity required, and develop the skills and expertise necessary, to achieve the Vision's goals. While ad hoc capacity-building strategies may be necessary to fill certain key skills gaps, a comprehensive capacity-development strategy that is based on the Africa Mining Vision or a relevant country mining vision is key to the holistic and sustainable development of mining that ensures benefit optimization.[95] Here, too, regional efforts are urged to achieve common developmental ends. For instance, countries may collaborate on cross-border projects, the sharing of best practices, the secondment of experts from one country to another, exchange programmes, capacity-building workshops and the establishment of regional training centres.

5.3. Governance

While developing institutions and meeting their capacity needs are critical governance measures for enhancing the benefits from mining, other manifestations of poor governance need to be addressed to maximize these benefits. Accordingly, the principles of transparency, public participation, accountability and equity (including gender equity), and their enforcement, are fundamental to the processes involved in the development of mineral resources, from licensing to managing the utilization of mineral revenues. Good governance also limits the risks associated with investing in a country, as well as the actual risks of conflict. For instance, transparent processes allow for effective public participation and contributions, as well as acceptance of and support for the outcome of such processes, such as the granting of a mineral right. Information-sharing is also necessary for effective governance. Therefore, while online cadastres constitute a significant transparency initiative, it is necessary to ensure that the information provided online is accurate and reliable. Accountability for decisions made in respect of managing mineral resources is also as important as managing the revenues derived from the development of these resources. Accountability is ultimately owed to the owners of the resources rather than to politicians or powerful cabals. Accountability processes that embody transparency and public participation are more responsive and effective, and the relevance of knowledge-building cannot be overstated. Thus, considerable efforts are required to educate and raise awareness among stakeholders on government policies, mineral projects and their impact on the environment and host communities, and the governance principles and their objectives.

5.4. Geological and mineral information

"A knowledge-driven African mining sector that catalyses and contributes to the broad-based growth and development of, and is fully integrated into, a single African market through … a comprehensive knowledge of its mineral endowment" Africa Mining Vision

Good knowledge of a country's geodata allows both the Government and private sector actors to make informed and better decisions about the development of mineral resources, including with regard to potential linkages with other sectors of the economy such as

[95] See box 15 on research and development; and South Africa, 2018, on provisions for human resources development.

agriculture, energy and infrastructure. Given the dearth of reliable geodata in African countries, improving data collection will significantly enhance the sector's potential and increase commercial exploration and investment. The more accessible the data, the lower the investment risks for exploration or mine development. African Governments are reportedly missing out on billions of dollars yearly in revenues owing to a lack of high-quality and up-to-date geodata, which is key to obtaining optimum value from auctions and negotiating optimal contracts, leveraging inward investment and ensuring the effective governance of the mineral sector. A review of the capacities and gaps of African geological survey organizations also shows that many countries put the sustainability of their mineral industries at risk or delay the development of new artisanal and large-scale mineral industries due to the lack of geodata (United Nations, ECA, and others, 2016).

One of the fundamental pillars of the Africa Mining Vision is optimization of the knowledge and benefits of mineral resources at all levels of mining and for all minerals. Accordingly, the Vision's action plan requires countries to improve their geological and mineral information systems by enhancing the capacity and role of national geological institutions and resourcing them, while also increasing regional mapping and exploration activities to upgrade mineral inventories and geoscientific data for broad-based sustainable growth and socioeconomic development. This means that countries must update and extend their existing geological data (i.e. maps and resource inventories) by forming research teams, undertaking fieldwork and using modern exploration technologies. The production, maintenance, management and analysis of up-to-date data also require techniques and skills that need to be regularly updated (see box 16).

Box 16

Strengthening and financing African geological surveys and geological and mineral information systems

African Geological and Mineral Information Systems Strategy

The African Geological and Mineral Information Systems Strategy of the African Minerals Development Centre contributes to the improvement of geodata through evaluations of the capacity of national geological and mineral information systems, background and feasibility studies, the capacity-building of national geological survey organizations and the strengthening of centres of excellence.

Governments must transform underresourced geological survey organizations from civil service departments that depend on government allocations into State agencies or corporations with significant financial autonomy to enhance their efficiency.

The Strategy will identify gaps and needs in countries' capability or potential to use geological and mineral information systems in mining and broad development processes.

Expertise and information resources will be accessed from local and international partners, and support mechanisms will be identified to finance the production, management and dissemination of geological and mineral information systems by African geological survey organizations and to facilitate training and capacity-building of geological survey organizations to that end.

The Strategy will support countries in generating and applying geological information for informed policy- and decision-making across the mineral value chain.

Implementation of the Strategy will equip Governments with better decision-making capacity to negotiate sustainable contracts with investors.

Options for the financing of geological surveys and mineral information systems

Options for financing geological surveys and mineral information systems include the following:

(a) Full government funding or autonomy to raise funds:

(i) By allocating a portion of mineral royalties or resource rents to geological survey organizations to fund exploration programmes, e.g. by imposing a national mineral resources replenishment levy of between 0.5 per cent and 1 per cent on all mining companies or companies involved in the extraction of minerals;

(ii) By selling geodata and geological services to private parties to raise funds. Geological survey organizations could also leverage geodata or other information obtained from their activities for equity in mining operations, which they can deal in (including to obtain loans) or earn dividends on in order to finance exploration programmes;

(b) African geological fund:

To be established under the auspices of the African Union. Member States will determine the mechanisms of the fund, including funding, utilization and modalities for accessing it. Countries will contribute a portion of royalties/rents to the fund. For sustainability, funds provided for exploration must be repaid by the company and Government if they lead to exploitation. The fund will also support capacity-building, research and development, and relevant technologies to maximize the value of mining;

(c) Public-private partnership:

Geological survey organizations to be established by law and endowed with a legal personality and the capacity to do business. For green fields, the private entity will provide funds for the exploration programme, as well as modern techniques of exploration and data analyses and storage. The parties will share the proceeds or benefits of any sale of or trade in geodata or auction of rights acquired by partnership. The private entity party may also be granted a right of first refusal to acquire a mining lease over part of the area explored. Geological survey organizations can exploit opportunities for knowledge and technology transfer.

Sources: African Geological and Mineral Information Systems Strategy, African Minerals Development Centre 2016, and Africa Mining Vision action plan.

6. Conclusion and recommendations

6.1. Financial modelling

Many and varied tangible and intangible considerations go into the determination of benefit optimization. While knowing and understanding the variables and options is useful for limited comparisons and analysis, a process that enables countries to quantify the variables in order to determine the possible revenues, effective tax rates and net benefits from a mining project would be even better. A number of countries, such as Côte d'Ivoire, Ghana, Guinea and Liberia, are resorting to the use of financial modelling tools to evaluate the profitability of mining projects and determine an appropriate distribution between the investor and the State of rents from projects. One such model, the International Monetary Fund fiscal analysis of resource industries model, has capabilities for revenue forecasting, analysis, integration with macroeconomic frameworks and comparison;[96] another is the model developed by the Senegalese geologist Abdoul Aziz Ndiaye. Increasingly, such tools will not only be used for analysing existing fiscal regimes, but will also influence the design of appropriate regimes for benefit optimization. Given the unique needs and aspirations of African countries, as expressed though the Africa Mining Vision, such tools can be enhanced or adapted to include analysis for the development of linkages and regional integration dynamics. As objective tools, they can also be used for reviewing mining fiscal regimes and moderating the application of incentives and stabilization provisions. It is anticiated that the provision of accurate data to ensure valid analysis will also facilitate the effective monitoring of mineral resources projects and their impact on host countries. Ultimately, the capability to quantify the costs and benefits of potential and existing mining projects should empower countries to negotiate optimal benefits from their mineral resources.[97]

6.2. Resource rent tax

Resource rent tax is rarely used by African countries for a number of reasons, including concerns that it could deter investment or that it is too complex, and concerns about political short-termism (Jourdan, 2014). It is, however, the most suitable option for a country's benefit optimization strategy, as it is the least distortionary tax, encourages mining at average grade and prevents sterilization. It is also compatible with other taxes and can be applied in combination with royalties, corporate income tax, customs duties and withholding tax. Offsets can also be applied to resource rent tax to promote economic linkages. A good place for countries to introduce the tax is in auctions of lapsed or abandoned mineral rights.

6.3. Auctions

Governments are strongly urged to use auctions to determine the price of mineral rights and the best entity to whom these rights should be granted. Auction procedures can be introduced in addition to existing licensing processes, especially for areas that have been relinquished or for which some data exist. Considering the Africa Mining Vision strategy to improve geological surveys and update geological and mineral information systems, the most efficient way to allocate mineral rights to recover the costs of exploration would be through auctions.

[96] See www.imf.org/external/np/fad/fari/.

[97] Efforts to design or develop innovative models could be promoted and funded through the research and development and the African Geological and Mineral Information Systems Strategy funding schemes discussed in boxes 15 and 16, respectively.

6.4. Mining 4.0

Mining offers many opportunities for the development or improvement of mining methods and processes and for inventions that can be adopted on a large scale. A small change in a method or process can lead to huge savings or cost reductions and, ultimately, increased benefits. The current fourth industrial revolution, or Mining 4.0, can be beneficial to African countries if they adopt the appropriate policies. It can also improve gender equity, as technical roles may not necessarily require being on the mine site and doing physical activities, areas of work which are often not accessible to women. The mining charter of South Africa provides useful examples of how such research and development and human resources development can be funded. For economies of scale, countries should consider cooperating and implementing these at the regional economic community level. Countries must also develop the regulatory framework and capacity required to boost intellectual property development and protection.

6.5. Regional mining visions

The Southern African Development Community (SADC) region hosts more than half of the world's reserves of platinum group metals (90 per cent), cobalt (50 per cent) and diamonds (50 per cent), along with significant reserves of chromite, gold, manganese, vanadium, titanium, iron, nickel and copper. It also possesses an extensive and wide range of the mineral resources required to catalyse the broad-based growth and development envisaged by the Africa Mining Vision. As the first region to undergo the regional mining vision process, the SADC region has a regional mining vision, based on the tenets of the Africa Mining Vision, that seeks to optimize benefits from the real linkage opportunities identified in the regional and local economy, including fiscal, downstream, upstream, infrastructure, knowledge, lateral (including research and development and human resources development) and consumption (i.e. the income of mineral linkage sector employees spent in the local or regional economy) linkages. If the Africa Mining Vision is to be achieved, it should be distilled into deliberate regional mining visions and mainstreamed through country mining visions to ensure that appropriate regional and local strategies are developed in order to optimize benefits from the continent's minerals.

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