Five Years After the Adoption of the Paris Agreement, Are Climate Change Considerations Reflected in Mining Contracts?

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Key Points

- The energy transition will be mineral intensive: production of certain critical minerals is estimated to increase by more than 450% by 2050. The mining and metals sector already contributes 5–7% of greenhouse gas (GHG) emissions globally and, as production increases, so too will emissions linked to the sector.
- Although fragile states in Africa contribute minimally to GHG emissions, they have a high degree of vulnerability to the impacts of climate change. Governments can and should mobilize the mining sector to play a meaningful role in meeting their climate mitigation and adaptation needs and those of project–affected communities. The increased demand for critical minerals to produce renewable energy and battery solutions tends to increase investment flows into the mining sector of several of those states, making it all the more crucial for their governments to ensure that new mining investments support sustainable development objectives. Requiring mining companies to contribute to sustainable development objectives, including climate objectives, can increase a country's competitiveness in international markets, leverage the sector's contribution to GHG emissions reductions, and minimize its impact on the country's environment and communities.
- Recognizing that laws are the ideal legal instrument to regulate the mining sector's contribution to climate mitigation and adaptation, governments may still consider updating model mining development agreements (MMDAs), or negotiating climate-related contractual provisions, as a stop-gap measure in the absence of relevant laws. In this paper, we explore whether governments are using, and how they can use, investor–state contracts to advance climate goals in the context of the mining sector.
- Based on our review of publicly available mining contracts signed by five fragile states in Africa (Chad, the Democratic Republic of Congo, Guinea, Mozambique, and Sierra Leone) post–Paris Agreement, we conclude that in large part the contracts reviewed do not include climate-related provisions. Robust climate provisions may be absent because these issues are regulated by laws rather than contracts.
- Though an exhaustive review of climate-related laws was outside the scope of this research, we found that some fragile states in Africa include climate-related provisions in law to varying degrees. For example, Guinea's 2019 Environmental Code encourages all companies, including in the mining sector, to use renewable energy and mandates the environment minister to implement the National Strategy for Climate Change Adaptation.
- We synthesize our findings and recommendations for six categories of contractual provisions, considering the most critical climate-related impacts and contributions of mining projects. Though the analysis focuses on contracts concluded by five fragile states in Africa, our policy recommendations are general in nature and apply to all host governments that do not already have robust laws in place to ensure that the mining sector contributes to climate change mitigation and adaptation objectives. Our recommendations for governments updating their model mining development agreement or negotiating contractual provision are as follows:
    - **Integrate renewable energy into mining projects.** Governments can support increased renewable power integration by requiring mining companies to use renewable energy sources. No evidence of this practice was found in the contracts reviewed.
    - **Reduce deforestation.** To restrict forest conversion, governments could require mining companies to account for direct, indirect, and induced impacts on forests at every stage of the operations, as well as systematically applying the mitigation hierarchy throughout the life-cycle of the mine. The absence of provisions on deforestation in the contracts analyzed may be because this aspect is regulated by laws rather than contracts.
    - **Require a climate risk assessment and community vulnerability assessment.** Mining contracts should expressly require mines to comply with national adaptation plans (NAPs) and climate adaptation guidelines where such instruments have been developed by the host country. Community development requirements contained in community development agreements (CDAs) should require mining companies to incorporate climate change adaptation strategies when requested by affected communities. None of the contracts reviewed includes provisions on climate change adaptation strategies.

- **Regulate water use.** Governments should expressly condition the grant of water rights to mining companies on stringent obligations regarding water use efficiency, include penalties for water overuse or release of non-treated waste water, and provide for a grievance mechanism for downstream communities whose water rights are impacted. The contract should include obligations for the mine to create shared-use opportunities to increase the access to water for communities and reserve the government's ability to alter water allocation to mining operations based on fluctuations in the amount of available water and the number of users reliant on the water source. The absence of provisions on water use in the contracts reviewed may be because this aspect is regulated by laws rather than contracts.
- **Require tailings dam design justifications.** The risk of tailings dam failure, exacerbated by climate change, can be significantly reduced by requiring companies to justify their tailings dam design. None of the contracts reviewed includes detailed provisions on tailings dams. The contract should ban dams upstream of communities and require that the mining plan demonstrate that the tailings dam follows the latest global safety standards and that ongoing maintenance and remediation activities will be conducted. Companies should model the risk of tailings dam failure due to climate-related risks in the environmental and social impact assessment (ESIA); and, the environmental management plan (EMP) should include the obligation to demonstrate that the tailings dam is adequately monitored for failure risk, with the goal of achieving zero failures. Tailings storage should use the best available technology. Relevant provisions only appear in eight of the contracts and are very limited in scope.
- **Integrate climate risks into closure plans.** While more than half of the contracts analyzed require mining companies to plan in advance for the closure of the mine and the environmental rehabilitation of the mine site, none requires them to integrate climate risks into closure plans. Contracts should:
  - Mandate that closure plans be submitted at the beginning of the project along with the ESIA.
  - Describe how the company intends to avoid or mitigate the environmental impacts associated with halting its operations.
  - Include rehabilitation strategies that reflect an understanding of the changing relationship between the ecosystem and the climate.
  - Require companies to model the long-term sustainability of rehabilitation projects.

1 Introduction

At the 2015 Paris Climate Change Conference, the world's governments set an ambitious goal of limiting global temperature rise to 1.5 °C over pre-industrial levels. To meet this goal, global anthropogenic CO_2 emissions must decline steadily and reach net zero by about 2050.[2] The pathway to a low-carbon future requires a fundamental shift away from fossil fuels and toward clean energy technologies.

This transition will be mineral-intensive: the World Bank estimates that the production of minerals could increase by more than 450% by 2050 to meet the growing demand for clean energy technologies.[3] How these minerals are produced will have a lasting effect on the clean energy transition. The mining and metal sector contributes 4–7% of greenhouse gas (GHG) emissions globally.[4] Without adequate regulation to incentivize climate-friendly sustainable operations, increases in mineral extraction risk increasing the sector's carbon footprint.[5] In addition, climate change acts as a risk multiplier by increasing the risk of flooding, drought, and landslides and, as such, exacerbates the negative externalities caused by poor mining practices.

First and foremost, climate change considerations should be incorporated into the climate, environmental, water, forestry, energy, or mining laws of mineral-rich countries. For example, in 2016, Kenya passed a climate law that requires climate mainstreaming in all sectors.[6] Guinea's 2019 Environmental Code encourages the use of renewable energy wherever possible and mandates the environment minister to implement the National Strategy for Climate Change Adaptation.[7] But the pace of legislative processes is often slow—and in countries where the legislation does not include climate change mitigation and adaptation requirements,[8] countries may turn to contractual provisions to compel the mining sector to shift to climate-sensitive practices. This paper assesses the extent to which this is being done through an analysis of all publicly available mining contracts signed by fragile states in Africa[9] after the adoption of the Paris Agreement in December 2015 that appear on ResourceContracts.org (21 contracts).[10]

Though the magnitude of African fragile states' contribution to global GHG emissions is minimal, these states have a comparatively high degree of vulnerability to the impacts of climate change.[11] In this context, governments can and should mobilize the mining sector to play a meaningful role in meeting their climate mitigation and adaptation needs and those of project-affected communities. In addition, the increased demand for critical minerals to produce renewable energy and battery solutions tends to increase investment flows into the mining sector of several of those fragile states,[12] making it all the more crucial for their governments to ensure that new mining investments support each country's sustainable development goals. Doing so, with respect to climate action, furthers both a country's competitiveness in international markets[13] and minimize the mining sector's footprint on the country's environment and communities.

Though our analysis focuses on contracts concluded by fragile states in Africa, the policy recommendations that we draw from their analysis apply to all host governments that do not already have robust laws that operationalize mitigation and adaptation goals and are eager to leverage and strengthen the role of their mining sectors in achieving sustainable development.

Our recommendations envision generating long-term savings over the life of the mines, even if some of those recommendations may in practice represent higher upfront costs for mining companies. For example, adopting renewable energy sources, though possibly more expensive at the outset, is more cost-effective than fossil fuels considering the life of a mine.[14] Avoiding deforestation early on also generates savings for mining companies when the time comes to fulfill their mine closure and rehabilitation obligations. Furthermore, by supporting community efforts to build resilience to climate change, mining companies have the opportunity to meaningfully contribute to project-affected communities.

Attention to climate change considerations that entail higher expenditures by mining investors at the initial stages of the operation of a mine also tend to reduce the tax revenues from mining for host governments in the short term. However, for governments, too, the long-term benefits outweigh the initial revenue reductions. As long as governments put strong progressive fiscal regimes in place,[15] they will be able to reap the upside from a climate-aware, low-carbon mining sector that will be more profitable than a business-as-usual, carbon-intensive mining sector in the medium to long term.

2 Climate-Related Provisions in Investor–State Contracts

Even as awareness of the mining sector's positive and negative contributions to climate change has increased, countries have not included robust climate provisions in the mining contracts analyzed. The absence of robust climate provisions may be because the sector's role in climate change mitigation and adaptation is regulated by laws rather than contracts. Where it is not, mineral-rich governments may seek to include climate-related provisions in investor–state contracts, including those concluded based on model mining development agreements (MMDAs). For example, investor–state mining contracts can include specific provisions to promote sustainable, climate-friendly mining practices, regulating the most critical climate-related impacts and contributions of mining projects. The following sections highlight six categories of provisions that may be included. These categories fall under climate change mitigation (requirements to minimize the use of fossil fuels, integrate the use of low-carbon energy sources, minimize deforestation, and restore forest cover) and adaptation (requirements to conduct climate risk and community vulnerability assessments, reduce water use, and design climate-resilient tailings dams and closure plans).

In addition, international standards can be incorporated into investor–state contracts to regulate certain aspects of investor behavior. For instance, ten of the reviewed contracts incorporate the International Finance Corporation's (IFC) Performance Standards.[16] While robust climate-related international standards do not yet exist to regulate mining projects, we expect existing standards to be updated or new ones developed given the global decarbonization agenda.

2.1 Climate Change Mitigation

2.1.1 Energy Sources

Mining operations account for 2–11% of global energy consumption.[17] The sector's energy consumption is largely fossil fuel-based; renewables have constituted less than 10% of total energy consumption since 1971.[18] As demand for minerals increases and ore grades decline, the mining sector's energy needs are projected to increase by more than a third by 2035.[19]

Governments have an opportunity to require that mining companies fulfill their increased energy needs through renewable sources, but our review found no evidence of this practice in any of the contracts reviewed. Six of the contracts reviewed include provisions that explicitly permit mining companies to build energy-related infrastructure, but none of these provisions required such infrastructure to produce clean energy.[20] Moreover, four of the contracts provide custom duty exemptions on fossil fuels.[21] Financial incentives, including fossil fuel subsidies, often lock in the sector's reliance on fossil fuels. Compared to diesel, renewables have relatively high upfront capital costs but are competitive on a non-subsidized basis. Although diesel plants have much higher operating costs, generous subsidies make fossil fuels an artificially attractive energy source; in addition, mining companies are often exempt from taxes on fuels used for off-road operations and energy generation.[22] Requiring use of renewable energy sources through contracts is one way to recalibrate incentives and support increased renewable power integration. To do this, governments may consider the following:

- Require companies to demonstrate in the mining plan that their designs are energy efficient and integrate renewable energy to the extent practicable.
- Require environmental impact assessments to include the modeling of GHG emissions, including from deforestation over the life of the mine (see the deforestation section below).
- Require companies to develop both a business-as-usual model, showing the trajectory that GHG emissions would follow in absence of any measures to reduce them, and a model showing how much emissions need to be reduced for the mine to achieve carbon neutrality in line with a 1.5 °C trajectory.
- Require environmental management plans to include all necessary measures over the life of the mine to achieve carbon neutrality in line with a 1.5 °C trajectory. These measures may include the use of renewables-based electricity or green hydrogen in lieu of fossil fuels in mining operations, energy efficiency improvements, deployment of energy

storage solutions, and even carbon capture and storage in case of heavy downstream processes.[23]

- Require companies to measure and disclose GHG emissions in accordance with accepted standards (e.g. the GHG Protocol[24]).
- Require mines to electrify surrounding communities using renewable power. This approach can be taken at a low marginal cost to the company while also fulfilling the important development objective of extending electricity to energy-poor communities.
- Do not include clauses that provide fossil fuel subsidies (e.g. through customs duty exemptions) in future contracts.

2.1.2 Deforestation

About half of active mines operate in forest landscapes.[25] Of these, more than half are located in low-income or lower middle–income countries.[26] Mining operations can result in significant deforestation as companies clear forests to build mines and surrounding infrastructure. Mining accounts for about 7% of total forest loss across Africa, Asia, and Latin America, and is associated with a decline in the quality and quantity of ecosystem services.[27] Mining-driven deforestation is likely to increase: in recent years, twenty or more new mines in forest landscapes have been commissioned annually, compared to four to ten during the 1980s.[28]

Ongoing deforestation has significant implications for climate change. Forests store vast amounts of carbon; when they are cleared or burned, their stored carbon is released into the atmosphere. Forestry and other land use activities have historically accounted for about a third of anthropogenic CO_2 emissions,[29] and between 2007–2016 close to 23% of total anthropogenic GHG emissions derive from these activities.[30] Reductions to forest cover directly affect local surface temperatures and can affect temperature and rainfall in regions hundreds of kilometers away.[31] Additionally, deforestation can accelerate soil erosion by up to 1,000 times, leading to an increased risk of landslides and flooding in certain regions.[32]

A third of contracts reviewed are silent on deforestation.[33] This is not surprising as deforestation is typically handled in legislation, including in our sample of countries. It is notable, however, that some contracts appear to allow unlimited forest conversion.[34] Others require prior authorization before cutting or logging protected forests.[35] Two contracts require reforestation or revegetation of land at the end of operations, where suitable.[36]

Restricting forest conversion through contract terms is particularly necessary in the absence of robust legislation that regulates the use of forested land.[37] To do this, governments may consider requiring mining companies to account for direct, indirect, and induced impacts on forests at every stage of the operations, including in the mining plan, the environmental impact assessment (EIA), and the environmental management plan (EMP), as well as systematically applying the mitigation hierarchy through the life of the mine.[38]

- The mining plan, for example, should require companies to collect data to establish a baseline[39] and provide the government with an accurate, third-party verified survey of forested land within the concession area.
- Under the EMP, companies could be required to formally report their forest conversion activities and conduct internal audits to demonstrate that they are achieving no net loss or net gain.[40]
- In cases where the contract area includes areas that should remain permanently forested (due to zoning errors, for example), the contract should also specify that these areas must remain permanently forested and provide clear penalties for violations.
- Additionally, a requirement of complete or partial reforestation should be included as part of the closure plan.[41]

2.2 Climate Change Adaptation

2.2.1 Climate Risk Assessment and Community Vulnerability Assessment

Climate change adaptation in a mining context refers to how mining companies can incorporate climate considerations into mining processes, practices, and structures to mitigate climate-related risks.[42] It relates to the company's "ability to adapt to changes, anticipate what might happen next, and absorb weather and climate-related shocks when they happen."[43] Importantly, climate change adaptation also refers to the role of mining

companies in strengthening the resilience of mining-affected communities to climate-related impacts.

Climate change poses risks to the mining sector and mining-affected communities with the increased frequency and intensity of severe weather events that affect mining operations both directly—in terms of mine closures, damage to infrastructure, access to water, and more dangerous working conditions—and indirectly, when their supply chains are similarly impacted. At the same time, integrating climate adaptation strategies into the lifecycle of a mining project can improve mine performance and efficiency, thereby reducing costs and even increasing revenues, including for the government through tax revenues.

Climate change can exacerbate vulnerabilities in host communities where droughts, floods, increasing temperatures, and natural disasters lead to a loss of livelihood, food shortages, crop failures, the spread of diseases, and worsening social conditions.[44] The presence of a mine can also negatively impact community resilience. Engaging with mining-affected communities to build their resilience to the impacts of climate change is fundamentally important for mining companies to maintain their social license and meet public expectations regarding corporate responsibility.

A climate adaptation strategy will ensure that mining-related assets are better able to withstand more frequent and severe climate events (see, for example, the Tailings Dams section below). It will also help to mitigate the project's impact on the surrounding environment and community, including water supply (see the Water section below), during the life of the mine and/or post-closure (see the Closure Plans section below). A climate adaptation strategy is most effective where mining companies integrate climate change considerations into their own corporate strategies and then make investment, construction, and operational decisions based on best practices of global climate change models tailored to local, site-specific conditions.[45]

None of the contracts reviewed includes provisions that relate to climate adaptation strategies.

Mining contracts should expressly require mines to comply with the national adaptation plans (NAPs) and climate adaptation guidelines when such instruments have been developed by the host country.[46]

Moreover, in the context of the EIA and EMP, mining companies should be required to assess climate risks and impacts and develop management plans to address them. In the same way that contracts often prescribe the contents of an EIA and EMP, they could similarly define what a climate risk assessment and related management plan entail. The climate risk assessment exercise entails defining critical thresholds and then assessing when and where critical thresholds could be exceeded triggering intolerable risks. Such thresholds could be "the available freeboard of a tailings dam, a maximum safe working temperature for personnel"[47] or the maximum length of a drought period for local communities. The threshold should be anticipated as being exceeded with growing probability and intensity as time passes. The data on probability, frequency, and magnitude of extreme weather events should rely on changes to the weather across short (12 hours), medium (5 days), and longer (annual trends) terms.[48] Moreover, the climate risk assessment should also cover incremental changes in climate conditions as these can affect the mining design and impact the surrounding environment on a cumulative basis. Lastly, the assessment should be conducted as if no adaptation measures were in place to apprehend maximum risk.[49]

The identified risks and site-specific mitigation strategies in the EIAs should also inform EMPs used to assess and monitor mining operations. In the mining development plan, mining companies should demonstrate the integration of the result of the climate risk assessment into the decisions on where to locate mining assets and in the design of mining-related infrastructure. Risk mitigation strategies should be constantly revised to reflect the latest predictions.[50] Emergency preparedness plans should also be put in place, reviewed, and updated to reflect best practices with respect to climate-related risks.

Mining companies are also well placed to assist by engaging early on with communities to improve their resilience to climate-related risks. This could include helping to develop emergency planning practices and supporting communities to develop and implement climate change adaptation plans.[51] In this regard, community development requirements contained in law or in community development agreements (CDAs) could require companies to contribute to community climate change adaptation strategies if communities deem it appropriate. For example, mining companies

could provide financial support and training to local communities for the communities to run a vulnerability assessment on their livelihood resources, develop adaptation measures, and to identify where the company could support communities' resilience.[52] These areas can be related to infrastructure, agriculture, water, health, and biodiversity, as well as emergency preparedness.

2.2.2 Water Use

Access to a stable water supply is crucial to mining operations. Water is required to suppress dust, process ore, cool and wash mining equipment, and manage tailings; without water, a mine cannot operate. Hard rock mining, in particular, involves a significant amount of water to separate and purify minerals. As mining operations expand to meet the mineral needs of the clean energy transition, the water footprint of the mining sector will increase.

The six largest mining companies operate 70% of their mining projects in water-stressed regions.[53] Water is already a source of conflict between mining companies and local communities, particularly when mines operate upstream of communities that rely on the same water source.[54] More frequent droughts due to climate change could lead to severe water shortages and more frequent flooding during the rainy season. This could inundate mines, cause more closures, leach harmful chemicals into the environment, and destabilize infrastructure such that mines may collapse.

Yet, out of the contracts reviewed that include water-related provisions, most do not limit the amount of water mining companies may use or require that mining companies treat the water they use before discharging it.[55] Like with deforestation, this is not surprising because water rights are usually established by legislation, including in our sample.

In the absence of robust laws that regulate water use, governments should expressly condition the grant of water rights to mining companies on stringent obligations regarding water use efficiency.[56] For example, in drafting the mining plan, companies should be required to demonstrate that they are using the most water-efficient designs, including planning for zero water waste and prioritizing water reuse over the request for water rights.[57] Additionally, the contract should include a penalty for water overuse or release of non-treated waste water and a grievance mechanism for downstream communities whose water rights are impacted.

The contract should include obligations for the mine to create shared-use opportunities when developing a water solution for the mine to increase nearby communities' access to water.[58]

The contract should also reserve the government's ability to alter water allocation to mining operations based on fluctuations in the amount of available water and the number of users reliant on the water source. Adjustments of this nature are statutorily authorized in South Africa, and other states could draw on these water use laws in drafting contract terms.[59] Relatedly, the EIA should contain requirements to periodically assess the climate impacts on the mining region's aquifer and adjust the mine's water use rights accordingly.

2.2.3 Tailings Dams

Tailings are a common byproduct of mineral extraction and are typically stored as a slurry in dammed reservoirs. The properties of tailings vary according to the size and structure of the mined rock and the chemicals used in mineral processing. Tailings may range from highly toxic to relatively harmless, though most are acidic and contain high salt concentrations. As the mining sector expands and ore grades fall, tailings waste is set to increase.[60]

The stability of tailings storage facilities largely depends on consistent land and weather conditions. Global warming–related changes in precipitation patterns and ambient temperature will affect soil moisture and ground temperature, weakening tailings structures. Under hot and arid conditions, for example, water evaporation will concentrate tailings, accelerate acid mine drainage, and lead to widespread environmental contamination. In wetter climates, heavy rainfall may cause tailings dams to overflow or collapse.

When tailings dams fail, they may release millions of liters of toxic waste into the environment, resulting in water pollution, widespread destruction, and loss of life. Although the total number of tailings dam failures is declining, the risk of catastrophic tailings dam failures has been increasing since 1990.[61] After 2000, the catastrophic failure rate has been about five or six serious failures every year.[62] Approximately 25% of worldwide tailings

dam failures are the result of extreme weather events. This may increase as the effects of climate change become more acute.[63]

The risk of tailings dam failure can be greatly reduced by requiring mining companies to justify their tailings dam design. However, none of the contracts reviewed included detailed provisions on tailings dams. Provisions appearing in eight of the contracts reviewed are limited to an obligation on the mining company to "secure and reinforce all water dams, tailings or excavation ponds to prevent collapse,"[64] or to ensure "all dams, whether for water, debris or waste, [are] safe to resist collapse."[65]

Upstream dams (in particular when they are immediately upstream of communities) should be explicitly banned by the contract and tailings storage should use the best available technology, including filtered tailings or dry stack.[66] The contract should require that the mining plan demonstrate that the tailings dam follows the latest global safety standards, such as the Safety First Guidelines for Responsible Mine Tailings Management,[67] and that ongoing maintenance and remediation activities will be conducted. Furthermore, in the EIA, companies should model the risk of tailings dam failure due to climate-related risks like flooding and heavy rainfall, making sure to assess all possible scenarios of mode of failure, their probabilities, the severity of the impact on local communities, and the corresponding costs. The EMP should include the obligation to demonstrate that the tailings dam is adequately monitored for failure risk, with the goal of achieving zero tailings dam failures. Further, the EMP should provide for both internal and external inspection systems, with the external inspection system involving technologies like satellite-based remote sensing, public disclosure of the inspection results, and a participatory monitoring role for local communities.

2.2.4 Closure Plans

Mining is a long-term but temporary use of land. As mining operations wind down, the site is rehabilitated according to the mine closure plan. Some governments require this plan to be submitted before mining begins, as it often influences how companies choose to construct the mine. Over the decades-long life of a mine and the decades post-closure, environmental conditions may change drastically. To ensure that the rehabilitated mine site remains stable over time, mine closure criteria should be designed through a climate change risk management lens, where the magnitude of the risk depends on the likelihood of a particular climate event and the consequences of that event.[68] For instance, insufficient water and high temperatures make it harder to re-establish the previous vegetation in rehabilitation efforts and there may be a need for drought-resistant vegetation, which could increase closure cost; 'bio-mining' and the growth of fibrous plants on old tailings dams to extract minerals could also help address the risk of tailings dam failure post-closure.

Early assessment of likely and unlikely climate risks enables companies to devise resilient, robust closure plans. This framework allows companies to assess whether a risk that is unlikely to occur in the short term is, in fact, highly likely to occur in the long term and evaluate how to best prevent it. Importantly, the closure plan is meant to be iterative; each successive version represents a more efficient solution.

More than half of the contracts analyzed—notably those concluded by Guinea and Mozambique—include provisions that require the mining company to plan in advance for the closure of the mine[69] and the environmental rehabilitation of the mine site.[70] For example, two contracts from Mozambique[71] require mining companies to comply with closure and rehabilitation obligations in mining and environmental laws and regulations, and in the project's EMPs, and to develop and periodically update a mine closure plan:

> Obligations in the rehabilitation and closure phase. The Mining Concessionaire must, in relation to its Mining Concession in the Contract Area, comply with all the rehabilitation and closure obligations described in the Mining Law, in the Environmental Regulation for the Mining Activity, and in the Environmental Management Plan and Environmental Management Program approved pursuant to that regulation and this Contract.[72]
>
> The Mine Concessionaire must develop and update periodically, every five years, as part of the Environmental Management Program, and in consultation with the beneficiary community and the local authority, a Mine Closure Program, which prepares the beneficiary community for the

> eventual closure of the Mining Operations. Such a program must be articulated with the Local Development Agreement […].[73]

However, none of the contracts requires the concessionaire to integrate climate risks into the development of the closure plans.

Contracts should require closure plans to be submitted at the beginning of the project at the time of the EIA submission[74] and describe how the mining company intends to avoid or mitigate the environmental impacts associated with closure, as well as how it plans to rehabilitate the mine site. Rehabilitation strategies should reflect an understanding of the changing relationship between the ecosystem and the climate. The contract should include a requirement to model the long-term sustainability of rehabilitation projects and set climate-responsive targets.

Additionally, the closure plan should include a section on the expected cost of mine closure that takes into account climate-related risks and provides a clear mechanism to ensure that the company meets the financial obligations associated with closure. Finally, the closure plan should require the company to actively monitor the mine site for a period of time post-closure and the company should remain liable for related negative environmental impacts that occur within several years of closure.

3 Conclusion

The investor–state contracts reviewed, concluded by five fragile states in Africa (Chad, the Democratic Republic of Congo, Guinea, Mozambique, and Sierra Leone), largely do not regulate the mining sector's contribution to climate change mitigation or the climate-related impacts of the sector. In some cases, this may be because there are relevant laws that apply. In other cases, where robust laws do not exist, contracts with permissive provisions stand to worsen the climate-related impacts of the project on the environment and communities. It is timely for governments to review and update mining legal frameworks—including domestic laws, investor–state contracts, CDAs, and MMDAs—to both increase climate resilience and align the contributions of the mining sector with sustainable development objectives.

Endnotes

1 The authors are grateful for the research support we received from Hind Al Aissi and CCSI fellow Sophie Thomashausen. The authors also thank Solina Kennedy for her support in developing the key points section.

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