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Netherlands Commission for  
**Environmental Assessment**

# Strategic Environmental Assessment for the Mining Sector

Lessons from country case studies



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#### **IISD HEAD OFFICE**

111 Lombard Avenue  
Suite 325  
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Canada R3B 0T4

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**Strategic Environmental Assessment for the Mining Sector: Lessons from country case studies**

April 2024

Written by Laurie Borrelli, Technical Secretary International (NCEA); Joyce Kortlandt, Technical Secretary International (NCEA); and Carlos Ortega, Environmental Advisor (IGF).

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## Acronyms

<b>ASM</b>	artisanal and small-scale mining
<b>ESIA</b>	environmental and social impact assessment
<b>NCEA</b>	Netherlands Commission for Environmental Assessment
<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>PPPs</b>	policies, plans, and programs
<b>SEA</b>	strategic environmental assessment
<b>SEMP</b>	Strategic Environmental Management Plan
<b>ToR</b>	Terms of Reference



## 1.0 Introduction

Strategic environmental assessment (SEA) is an approach that can enhance the mining sector's contribution to sustainable development. It is a strategic-level approach that has evolved out of project-level environmental and social impact assessment (ESIA) (Netherlands Commission for Environmental Assessment [NCEA], 2017).

While the role of ESIA in large mining projects is well known, the positive role of SEA in developing a sector vision for responsible mining has only recently emerged. The same applies to the role of SEA in integrating mining activities into the broader context of national and regional development planning and its role in aligning these activities with existing policies on, for example, biodiversity.

The aim of this report is to encourage the use of SEA in the mining sector. This is more relevant than ever, given the global energy transition and the steeply rising demand for minerals. Building on a range of case studies, the report shows the potential benefits of SEA for mining.

The specific goals of this report are to

- encourage key actors to be more aware of the benefits of SEA
- identify challenges in developing SEA for the mining sector
- discuss ways to overcome these challenges, based on a range of case studies

The report highlights the need for capacity building, institutional collaboration, and stakeholder participation in relation to SEA for mining, underlining the importance of SEA in relation to critical minerals. It is directed at governments, civil society, mining companies, and the public in countries where mining takes place.



## 2.0 About SEA

SEA is an approach for assessing the impacts of proposed policies, plans, and programs. It offers a broad perspective, taking into account social, cultural, economic, and institutional aspects. SEA and ESIA can enhance the mining sector's contribution to sustainable development. They can also help the sector to avoid or reduce negative consequences for the natural environment and people.

### Definition of SEA

SEA can be defined as a range of “analytical and participatory approaches that aim to integrate environmental considerations into policies, plans, and programmes, and evaluate the interlinkages with economic and social considerations” (Organisation for Economic Co-operation and Development [OECD], 2006).<sup>1</sup> It is a process that aims to

- structure public and government debate in the preparation of policies, plans, and programs (PPPs).
- feed this debate through a robust assessment of the potential environmental, social, and, where needed, economic consequences of PPPs.
- ensure that the results of assessment and debate are considered during decision making and implementation.

SEA aims to ensure that environmental and social concerns are considered early in the development of PPPs, thereby helping to avoid or minimize negative environmental and social impacts and enhance sustainable development.

The applicability of SEA is wide. It can be used to improve strategies ranging from legislation and country-wide development policies to more specific sectoral and spatial plans. To date, SEA has been applied variously to hydropower developments, river and delta planning, the oil and gas sector, and extractive industries. It has been used in countries as diverse as Bolivia, Canada, Ghana, Indonesia, and the Netherlands (NCEA, 2017, 2019).

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<sup>1</sup> Some development agencies and governments use the term “strategic environmental and social assessment” to make clear that strategic assessment should include a focus on social issues. In practice, there is no difference in the approach or focus, so the terms should be considered as synonymous. Some institutions also use other terms to describe the same approach, such as “regional assessment” or “sector environment assessment.” This report consistently refers to SEA.

## SEA and ESIA

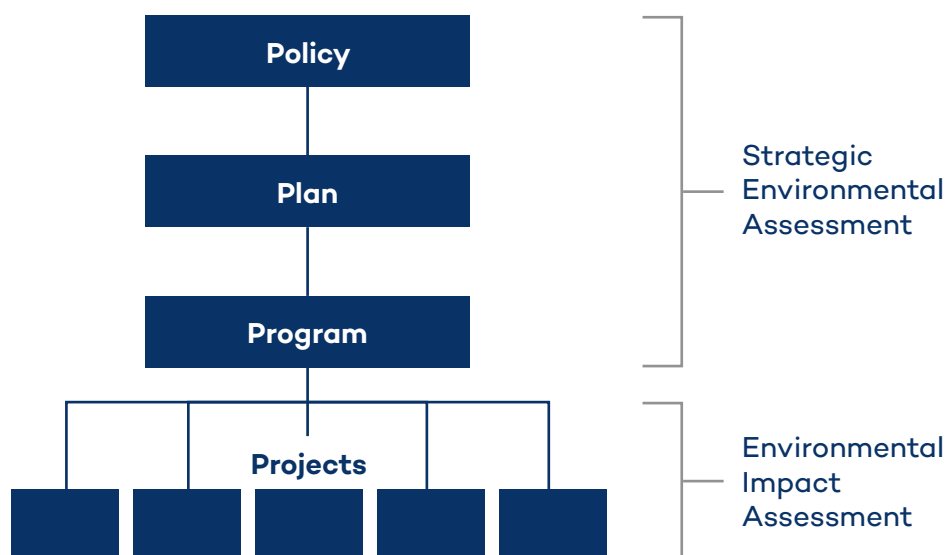
SEA has evolved out of project-level ESIA to address the need for a similar assessment at the strategic decision-making level. SEA is not a substitute for ESIA, but a complement to it. Table 1 shows the main differences between the two.

**TABLE 1.** Differences between SEA and ESIA

SEA	ESIA
Applied to PPPs with a broad and long-term perspective	Applied to projects and their specifications
More of a multi-stage, iterative process	Usually a well-defined, linear process
Broad range of policy options and alternatives	Limited range of project alternatives
Broader perspective, with emphasis on balancing environmental, social, and economic objectives	Narrower perspective, with emphasis on minimizing and mitigating impacts
Responsibility of the public agency in charge of PPP	Responsibility of the project proponent

Source: Adapted from NCEA, 2017a.

**FIGURE 1.** SEA and ESIA in decision making



Source: Reprinted with permission from OECD, 2006.



## SEA as Part of the Legal Framework

SEA originated in the United States in 1969, and since then, it has been implemented in many other parts of the world (NCEA, 2023). It is now mandatory in most developed countries and a growing number of developing countries. The world map in Figure 2 shows the spread of mandatory SEA in 2024.

**FIGURE 2.** World map of SEA legislation (2024)



Source: Reprinted with permission from NCEA, 2024.

The legal requirements that SEAs must meet in a country help to set the benchmark for specific SEAs in that country (for example, in relation to procedures and mandates). However, following a legal procedure does not automatically guarantee an effective SEA (NCEA, 2023): other factors, such as political will and technical capacity, are also important. Some countries that have not enshrined SEA in law still undertake the assessment successfully on a voluntary basis.



## 3.0 Significance for the Mining Sector

Good-quality ESIA can prevent or remediate many issues at the level of individual mining projects. However, several major issues that characterize countries where mining activity is booming cannot be addressed by ESIA at the project level (NCEA, 2017, 2019), including

- the need for in-country staff, expertise, regulations, policies, and institutions to coordinate the development of new mining activities;
- balancing the interest of the mining sector with other social, economic, and environmental interests;
- preventing environmental degradation due to artisanal and small-scale mining (ASM) and ensuring that artisanal miners' livelihoods are improved;
- the cumulative effects of numerous mining activities;
- the impact of mining proposals on medium- to long-term infrastructure planning;
- assessing the contribution of mining to a country's overall development strategy, including how mining can contribute to inclusive and responsible growth, with a link to the UN Sustainable Development Goals.

### General and Specific Advantages of SEA

SEA has multiple general advantages, including the following (NCEA, 2017):

- better insight into the trade-offs between environmental, economic, and social issues, which increases the chance of finding a solution that benefits all stakeholders;
- warnings to decision-makers and the public about unsustainable development options, which can help to prevent costly mistakes and conflicts around the use of natural resources;
- better understanding of the cumulative impacts of multiple smaller developments and the opportunity to increase the coherence between projects;
- enhanced credibility of government decisions, which builds public trust in the planning process and leads to more support for implementing the plan.

In the context of mining, it is possible to distinguish between the relevance of SEA for governments, mining companies, and affected communities (NCEA, 2019):

- **for governments:** The use of SEA helps to balance multiple interests in relation to mining and the planning of the associated infrastructure. For example, it can lead to better preparedness and stronger governance in managing biodiversity and natural resources. It can provide clarity on the tasks that need to be carried out, with a clear division of responsibilities between government agencies and private sector partners. Furthermore, it offers a clear view of the concerns and aspirations of other stakeholders in society and ensures more transparent decision making, which usually leads to more support.
- **for mining companies:** Carrying out SEA for a specific sector or development plan in the region in which a company wants to invest can lead to more sustainable and cost-effective projects. A SEA may outline the most suitable areas for investments, preventing costly mistakes (such as those caused by water scarcity). It can engage local stakeholders, which may build support for mining and could prevent resistance or conflict. Research and assessment undertaken as part of SEA baseline studies can also be used for project-specific ESIA, saving time and money. This all helps to secure effective investment in the mining sector while maximizing the benefits for companies and society.
- **for communities in mining countries:** The use of SEA may lead to mining activities making a better contribution to regional and national development while minimizing the negative consequences. Vulnerable groups and ecosystem services may receive the attention they require through their active involvement in the SEA process.

## Objectives of SEA in Mining

The objectives of SEA in the mining sector usually depend on the kind of plan for which the SEA is being undertaken. A SEA could focus specifically on national mining sector policy or legislation, or it could focus on regional development planning within a geographic area. A SEA for national sector planning helps to shape the development of mining PPPs by integrating environmental and social considerations (NCEA, 2019). A SEA for regional development planning supports authorities in integrating (new) mining activities into spatial or land-use planning, considering potential synergies or conflicts with other sectors (NCEA, 2019). Table 2 presents the main differences.

**TABLE 2.** SEA objectives: National sector planning and regional development planning

SEA for national sector planning	SEA for regional development planning
<p>Assists national mining departments and agencies in:</p> <ul style="list-style-type: none"> <li>• Linking mining sector development to infrastructure development needs governed by other departments or ministries (for example, road, rail, pipeline, water transport).</li> <li>• Aligning mining sector plans with other national policies, such as avoiding conflicts with national labour rights policies.</li> <li>• Assessing the adequacy of existing institutional capacity.</li> <li>• Strengthening the mining sector regulatory framework in relation to the environment, health and safety, cultural heritage, biodiversity, and so on.</li> <li>• Addressing the cumulative effects of (often unregulated) ASM.</li> <li>• Governance and revenue management; equitable distribution of mining revenues.</li> <li>• Skills required for employment (technical and vocational education), and spin-offs (for example, creating small and medium-sized enterprises or value-added industries).</li> <li>• Technology issues: investment in mining-related research and development.</li> <li>• Required capacity for compliance and enforcement mechanisms.</li> <li>• Ensuring the consideration of the long-term environmental and social aspects of mine closure and the adoption of appropriate measures to rehabilitate affected areas.</li> </ul>	<p>Supports authorities by:</p> <ul style="list-style-type: none"> <li>• Assessing potential positive and negative interactions with other productive sectors, such as livestock, agriculture, and fisheries.</li> <li>• Establishing priorities for conservation and development and characterization of stakeholders.</li> <li>• Encouraging regional intersectoral coordination to increase the efficiency of the transport network, rural and urban planning, and biodiversity conservation efforts.</li> <li>• Addressing human rights, land-use rights, and community participation.</li> <li>• Planning for public services (education, health care, public water supply) where new mining developments are expected.</li> </ul>

Source: NCEA, 2019.

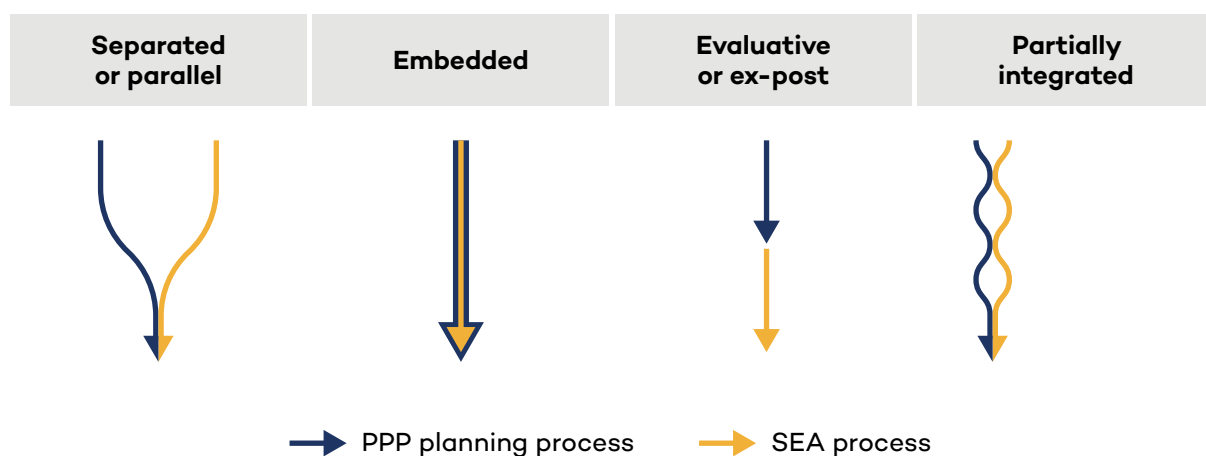
For both national sector planning and regional development planning, SEA provides opportunities for stakeholder engagement and public participation through the involvement of local communities, Indigenous Peoples, non-governmental organizations, and independent experts, which enhances transparency, inclusiveness, and accountability in mining projects. By helping to incorporate local knowledge, concerns, and aspirations, SEA can lead to more informed and socially acceptable mining decisions.

The starting point for designing a SEA is to consider the national context and the characteristics of the planning process. Several options are possible for linking SEA to the planning process (NCEA, 2023):

- **parallel process:** The PPPs and the SEA are developed separately and connected at the end.
- **embedded process:** The development of the PPPs and SEA is fully integrated into one process.
- **ex-post process:** The SEA is developed after the planning process, to evaluate the final PPPs.
- **partially integrated process:** There are regular interactions between the planning process and the SEA process.

A SEA will have the most influence on the PPPs in an embedded process and the least influence in an ex-post process, as shown in Figure 3.

**FIGURE 3.** Linking SEA to the PPP planning process



Source: Adapted from NCEA, 2023.



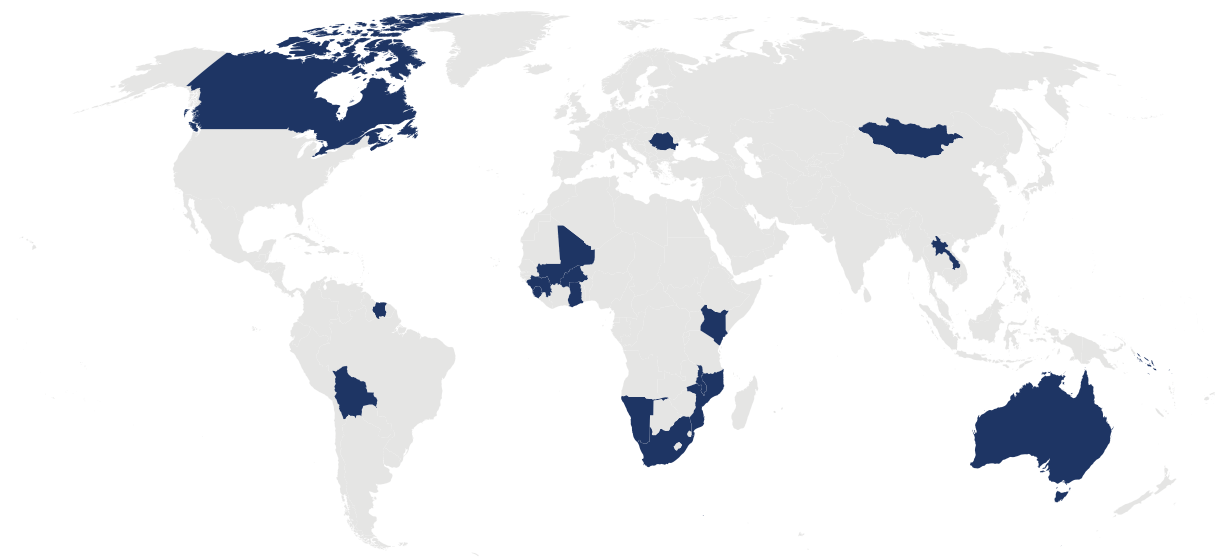
The Rossing Uranium Mine  
in Namibia (Peter Tarr)

## 4.0 SEA in Practice

### Examples of Countries Applying SEA in the Mining Sector

All continents have countries that already use SEA for mining: in mining policies specifically and in spatial planning for areas where mining is an important factor (see Figure 4 for a non-comprehensive overview).

**FIGURE 4.** Countries using SEA for mining initiatives



#### AFRICA

Burkina Faso  
Ghana  
Guinea  
Kenya  
Malawi

Mali  
Mozambique  
Namibia  
Sierra Leone  
South Africa

#### ASIA

Laos  
Mongolia

#### EUROPE

Romania

#### NORTH AMERICA

Canada

#### OCEANIA

Australia  
Solomon Islands

#### SOUTH AMERICA

Bolivia  
Suriname

Source: Authors.

This report shows how SEAs influence PPPs, the roadblocks they face, and how these are addressed. Five SEAs were selected for detailed study using the available information. At the time of writing, four of these SEAs were complete, and the remaining one was still in development. Table 3 gives an overview of the five selected cases, including their timelines and funding.

**TABLE 3.** Overview of the case studies presented in this report

Country	Title of the SEA	Timeline	Costs	Funding
Canada	Regional Assessment in the Ring of Fire Area	2020 onwards		Federal Government of Canada
Ghana	SEA of Mining Sector	2006–2008	USD 20,000–40,000	European Union
Mozambique	SEA for the Planning of Resource Use in the Mozambique Part of the Zambezi Catchment	2011–2016	USD 600,000	Embassy of the Netherlands
Namibia	SEA for the Central Namib Uranium Rush	2009–2010	USD 150,000	Deutsche Gesellschaft für Internationale Zusammenarbeit
Romania	SEA for the Mine Closure and Social Mitigation Project	1998	USD 275,000	World Bank

Sources: Authors, Government of Canada, 2023; I. Hasheela, personal communication, 2024; World Bank, 2004.

## How SEA Influences PPPs

The four case studies in this section show how SEA has influenced PPPs in both national mining sector planning (Namibia, Ghana, and Romania) and regional development planning (Mozambique). They show that SEA influences PPPs not only on paper but also in practice.

### National Sector Planning

#### Namibia

In Namibia, the SEA had a real impact in practice. It helped to reduce the proliferation of infrastructure and avoid compromising the availability of surface water and groundwater (Geological Survey of Namibia, 2017; Olagunju & Gunn, 2015). Rapidly increasing global demand for power and a likely shortage of uranium resulted in a sudden scramble for prospecting rights in Namibia in the first decade of this century (NCEA, 2019). The Government of Namibia initiated a SEA for the uranium sector, and in 2007 the Ministry of Mines and Energy placed a moratorium on issuing new exclusive prospecting licences until

after the SEA was completed (I. Hasheela, personal communication, March 1, 2024). The objectives of the SEA were to advise the government on maintaining or lifting the moratorium, help individual mining companies consider their role in the bigger picture, and provide input for regional and local planning (Southern African Institute for Environmental Assessment, 2010). The SEA led mining companies to jointly develop new infrastructure (such as powerlines, roads, and pipelines) and a seawater-desalination facility. This resulted in the optimized use of resources and less infrastructure development than otherwise would have been the case. The mining companies indicated that the SEA encouraged better projects and made the ESIA easier because much of the baseline data and information had already been produced as part of the SEA. The companies benefited financially from the reduced costs associated with carrying out the project-level ESIA and developing the new infrastructure (P. Tarr, personal communication, September 6, 2023).

## Ghana

The mining SEA in Ghana enhanced the development and adoption of the minerals and mining policy in 2014 (NCEA, 2019) and supported the mining permit process for ASM (R. Afenu, personal communication, December 14, 2023). In the early 2000s, developments in Ghana's mining sector were accompanied by growing public concern about its social and environmental impacts. The sector's development and prevalent illegal mining activities, especially in the small-scale mining sector, posed a significant threat to valuable ecosystems and resource conservation (Y. Osei, personal communication, October 31, 2023). A SEA on Ghana's mining sector was completed in 2008. The Minerals Commission, the Environmental Protection Agency of Ghana, and other key stakeholders then used the SEA to improve the draft minerals and mining policy. The SEA helped them to focus on strategic decisions with long-term objectives (NCEA, 2017). A key recommendation of the SEA involved facilitating the mining permit process for ASM by strengthening processes at the district level, involving other stakeholders, and creating mining offices close to ASM locations. This led to the creation of more district mining and satellite offices to promote and regulate the mineral resource sector more effectively at the local level (Hilson et al., 2022). However, these satellite offices are still not adequately resourced (R. Afenu, personal communication December 14, 2023).

## Romania

The mining SEA in Romania influenced the program design for mine closure, prevented costs related to tailings dam failures, and resulted in new policies on dam safety. In 1998, the Government of Romania introduced a comprehensive strategy for reforming the mining sector (World Bank, 2007). The strategy involved several elements for modernizing the sector, such as reducing subsidies, ceasing activities in mines that were dangerous or where reserves were becoming exhausted, and addressing employment and social mitigation measures for workers in mining regions. A SEA was prepared specifically to inform the environmentally sustainable closure of selected mines. By providing the analytical basis for the environmental remediation programs, the SEA resulted in mine closures that were environmentally sustainable (World Bank, 2007). The SEA also resulted in new legislation related to the safety of dams, including tailings management facilities. Eight tailings dams were reclaimed, thereby reducing the potential risk of dam failure and the associated environmental and social consequences (Abdysheva et al., 2014).



## Regional Development

### Mozambique

In Mozambique, the SEA brought environmental and social aspects into the planning process for the lower Zambezi Valley and influenced planning at the regional and local levels (S. Tchamo, personal communication, September 29, 2023). The Zambezi Valley forms 20% of the national territory of Mozambique. It is rich in natural resources and fertile soils, and it has a high biodiversity value. The SEA focused on Tete Province and its surroundings, predominantly a mining area, where the development of the mining and agricultural sectors has led to increased pressures on land and water and resulted in competing claims and conflicts over these resources. The SEA aimed to support a strategic vision for the Zambezi Valley. It was developed between 2011 and 2016, hand in hand with a multisectoral plan and a spatial territorial development plan. The SEA brought environmental and social aspects into the planning process, as well as stakeholder participation and scenario development (Biofund, 2014). The final integral territorial plan created the legal framework for SEAs for all lower-level physical plans, such as water-management plans, integrated development plans, and management plans for conservation areas. The local and regional plans for climate adaptation followed the SEA, which was also used to determine the best resettlement areas for families affected by Cyclone Kenneth in 2016 (NCEA, 2023).

The case studies presented in this section describe the influence of SEAs on PPPs, as well as their actual influence on the ground. It is important to acknowledge that changes cannot be attributed to a SEA alone, as there are always other factors that may play a role.

## Obstacles to Applying SEA in the Mining Sector and Ways to Address Them

The obstacles and challenges that may be faced when applying SEA in the mining sector include

- lack of awareness and understanding among stakeholders about the benefits and importance of SEA (Dusik & Xie, 2009);
- limited institutional capacity, including inadequate resources and weak processes (Slunge & Tran, 2014);
- integrating SEA with existing decision-making processes;
- access to reliable, up-to-date data on the environment and potential environmental impacts (Dusik & Xie, 2009);
- working in a conflict-affected environment;
- limited interest in and resources for engaging a wide range of stakeholders (Slunge & Tran, 2014);
- lack of political will and commitment to sustainable mining practices (Slunge & Tran, 2014);
- monitoring and enforcement mechanisms and regulatory oversight to ensure that SEA recommendations are implemented (Geological Survey of Namibia, 2017).

In all the case studies presented in this report, the respective countries encountered a mix of challenges. The case studies show how each country addressed different obstacles and highlight the success factors that contributed to positive outcomes.

## National Sector Planning

### Namibia

A challenge for the Namibian mining SEA was that many stakeholders had a limited understanding of the issues at stake, and some resisted participating in the process. Providing information helped address the problem (P. Tarr, personal communication, September 6, 2023). The SEA team was able to convince stakeholders to participate, and the issues that stakeholders raised during consultation meetings formed the basis of the *Strategic Environmental Management Plan* (SEMP), which was developed as part of the SEA process. Keeping the momentum and legacy of the SEA alive was also a challenge due to the changing ownership of many mines and reductions in project funding (P. Tarr, personal communication, September 6, 2023). To address the lack of commitment among certain stakeholders, the SEMP Office embarked on a roadshow. All government and parastatal institutions that were involved in data collection and data monitoring or were responsible for meeting particular targets were visited and informed about the objectives of the SEMP and the importance of their institution's contribution (Geological Survey of Namibia, 2017). Contributing to the SEA's successful development were the fact that the agencies knew and trusted each other, the strong buy-in from government and mining companies, and the broad stakeholder involvement. The quality of the SEA secretariat, the availability of adequate funds for the SEA study, and the flexibility of the donor and the SEA team also contributed to a successful outcome. A success factor for monitoring was that the SEMP used indicators that were already being monitored by existing departments (P. Tarr, personal communication, September 6, 2023).

### Ghana

Although the mining SEA in Ghana was of a high quality, and its recommendations were outstanding, implementation was a major challenge. An addendum that was subsequently prepared helped strengthen the SEA's impact on sector planning and development outcomes (NCEA, 2011; Y. Osei, personal communication October 31, 2023). With a change in government, key people who were involved in these processes were reassigned to other offices or resigned, which led to a lack of continuity in the process. There was also an apparent lack of commitment among government agencies to enforce some of the recommendations, probably because they were not aware of the SEA (R. Afenu, personal communication, September 26, 2023). The environment and mining matrix that was developed in 2012 helped address some of these issues (I. Steinhauer, personal communication, December 11, 2023). Another challenge for developing the SEA was the available budget: a lot of effort was put into a wider stakeholder consultation process, which came at a relatively high cost that was difficult to cover effectively because it had not been included in the original budget (NCEA, 2011). However, the range of participatory events organized at different levels (local, regional, national) and the level of participation by different stakeholders was impressive (Y. Osei, personal communication, December 14, 2023). Another success factor was the good relationship between the Environmental Protection Agency of Ghana and the Minerals Commission during the development of the SEA (R. Afenu, personal communication, December 15, 2023).

## Romania

Challenges in the Romanian SEA included a lack of knowledge and expertise about the environment and mine closures. There was also a lack of clarity about responsibilities and resources for environmental monitoring and protection. These challenges were addressed in the SEA itself (I. Steinhauer, personal communication, December 11, 2023). The SEA overcame the missing overview of environmental issues in mining by establishing a baseline and identifying the mining subsectors with the greatest environmental risks. The World Bank assisted the Government of Romania in undertaking a poverty and social impact analysis of mining sector reforms (World Bank, 2005). The SEA included an institutional analysis to evaluate the government's capacity for environmental management. This helped provide clarity about the types of interventions needed, responsibilities, and costs (I. Steinhauer, personal communication, December 11, 2023). Another challenge related to the government's commitment during the implementation of the SEA, which fluctuated with changes in administration and leadership within the different ministries (Abdysheva et al., 2014). A legacy of patronage of mining companies, especially in single-industry towns, undermined the government's ability to operate at the local level. The success factors included stakeholder participation and the commitment of different ministries during the preparation of the SEA. In particular, the Ministry of Water, Forests, and Environmental Protection and the Ministry of Industry and Commerce both showed active commitment during the conceptualization and preparation (I. Steinhauer, personal communication, December 11, 2023).

### BOX 1. SENEGAL: LESSONS FROM A SEA FOR OIL AND GAS DEVELOPMENT

When a ministry embarks on a sectoral SEA, it needs to identify other ministries and agencies with jurisdiction and responsibilities that are relevant to the sustainable development of that sector. It is helpful to formalize their collaboration in an ad-hoc ministerial decision. In Senegal, a SEA was undertaken for oil and gas development (République du Sénégal, Ministère de l'Environnement et du Développement Durable, Ministère du Pétrole et des Energies, & Ges- Petrogaz, 2022). Notably, a ministerial decision jointly made by the Minister of Energy and the Minister of Environment structured the collaboration among these and several other ministries. This interministerial decision outlined the objectives of the collaboration, which included the development of a joint SEA and the formulation of sector-specific directives for implementation by various ministries. The decision delineated the responsibilities of each participant and allocated the necessary resources for the execution of the process (S. Nootboom, personal communication, February 19, 2024).

## BOX 2. REGIONAL DEVELOPMENT SEA FOR CRITICAL MINERALS: LESSONS FROM CANADA?

This case study is current and not yet completed, but it is a good example of important lessons to consider when searching for critical minerals in ecologically and socially sensitive regions.

The Ring of Fire is a remote area in northern Ontario, Canada, that is accessible only by plane or ice road in winter. It represents one of the most promising opportunities for critical mineral development in Ontario, with long-term potential to produce chromite, cobalt, nickel, copper, and platinum. However, the region is home to the second largest intact peatland complex in the world, an ecosystem that stores an estimated 35 billion tonnes of carbon and serves as a crucial habitat for caribou, wolverines, and many migratory birds (Wildlife Conservation Society Canada, n.d.). The area is also home to dozens of First Nations, who have inhabited it since time immemorial and consider themselves guardians of the land. Therefore, the Ring of Fire has the potential to play a large role in Canada's energy transition efforts, but the ability to exploit the critical minerals it holds faces important environmental and social challenges.

The SEA is part of a regional development plan that is being promoted by the current provincial government to facilitate access to the resources in the Ring of Fire. As part of its SEA, government authorities developed terms of reference (ToR) in 2020 without the proper involvement of Indigenous groups (McIntosh, 2022). As a consequence, First Nations raised concerns about the draft ToR and asked the federal environment minister to reject the terms entirely in early 2022 because they focused on too small a geographic area, did not include all possible development types, and limited First Nations to "token" roles. This prompted the minister to organize a meeting with some of the First Nations leaders, using a conciliatory and understanding tone with the five chiefs who attended. The minister agreed to restart the SEA process through co-developing new ToR with the equal partnership of the relevant First Nations (McIntosh, 2023).

Considering the high social and environmental costs of developing mining projects in the Ring of Fire area, the new approach to the SEA started by the federal environment minister in 2023 gives the process a better chance of success. Indeed, giving Indigenous groups an active and central role in the process ensures not only that social aspects will be considered but also that environmental considerations will gain importance, as First Nations' knowledge of the land gives them a unique perspective on how this highly sensitive ecosystem can be sustainably developed.

## Regional Development

When the territorial and multisectoral development process for the Zambezi Valley started in Mozambique in 2011, this was the first experience of SEA for the majority of the government staff involved (I. Steinhauer, personal communication, December 11, 2023). While there was some previous SEA experience in the country, overall awareness and understanding of the concept was weak, and training for decision-makers was poor. Mozambique dealt with these challenges by discussing the SEA at the ministerial level, providing some training for high-level decision-makers, allowing consultants to play a leading role, and inviting independent experts to provide quality control (S. Tchamo, personal communication, September 29, 2023).

Independent advisory reports supported by regular coaching throughout the entire planning process led to an increased understanding and ability to apply SEA in a planning context. The result was a plan that now contains monitoring and mitigation measures that aim to reduce negative impacts on communities and the environment (Biofund, 2014). The success factors included the public consultation process, which provided an important platform for dialogue; the coaching; and the involvement of both the regional development authority and the environmental agency throughout the process (S. Tchamo, personal communication, December 13, 2023).

There is no blueprint for dealing with obstacles and challenges. Addressing roadblocks demands a multi-faceted approach involving capacity building, stakeholder engagement, and institutional strengthening. International collaboration and knowledge sharing can also play a crucial role in overcoming challenges and ensuring effective SEA implementation in the mining sector.



## 5.0 Conclusions and Recommendations

SEAs can enhance the mining sector's contribution to sustainable development. The case studies in this report show how SEAs influence PPPs in different ways and how they can have a real impact on the ground. They also reveal some challenges for the development of mining SEAs, ranging from lack of knowledge and understanding to changes in leadership and lack of implementation. Overcoming these obstacles demands a multi-faceted approach. The case studies show that the key success factors for developing and implementing SEAs are (a) trust and collaboration between different government agencies, and (b) wider stakeholder participation.

### Recommendations for Government

- Ministries of mining and the environment, environmental assessment agencies, universities, and other actors should address the lack of understanding about the benefits and importance of mining SEAs by **raising awareness and providing capacity-building initiatives**. The mining industry can have large and far-reaching impacts on the natural and social environment. Stakeholders may not be familiar with the concept of mining SEAs or their potential value in promoting sustainable mining practices. Raising awareness and providing capacity-building initiatives can help stakeholders understand the added value of mining SEAs and their role in the development of PPPs.
- Government institutions should **collaborate closely during the development of SEAs** for PPPs in relation to mining, to ensure that SEAs are developed and implemented successfully. The relevant ministry needs to champion SEAs in the mining sector. However, other ministries, departments, and institutions—such as those responsible for employment, agriculture, forestry, and water—have an important role to play. Government agencies tend to have differing guidelines and objectives that can clash when trying to reach compromises on specific issues, such as mining development. One way in which collaboration between government agencies can be directed is to establish formal agreements or memoranda of agreement for specific cases.
- Authorities developing a mining SEA should **ensure that interested groups are involved throughout the SEA process** by mapping stakeholders and developing stakeholder engagement and communication plans at the beginning of the process.

Stakeholders include authorities across all levels of government, private companies, non-governmental organizations, and local and Indigenous communities. Engaging stakeholders can be challenging due to competing interests, power dynamics, and limited resources. However, involving all interested groups from the start and ensuring that they have a say in the SEA's development is not only important for the support and quality of the SEA but also essential for its implementation.

- Governments should **consider the current and future importance of various critical minerals** that they may hold in their territory and develop SEAs according to the specific characteristics of the location of these resources. Governments should be aware of what critical minerals they possess underground, make use of the latest technological advancements, and assign mining importance to the relevant minerals through the development of appropriate PPPs. Connected to these PPPs, governments should ensure that the energy transition can be executed sustainably by developing SEAs that include a range of alternatives and scenarios while considering the social and environmental characteristics of the regions where the critical minerals are to be mined.

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