



# MAKING MINING “FOREST-SMART”



*Minkébé, Gabon (By Gustave Mbaza/WWF Gabon)*



# INTRODUCTION

Mining activities are increasingly taking place in forested landscapes, driven by the mineral needs of technological advancements and a growing population. While not a main driver of global deforestation, mining in forests poses an increasing challenge, resulting in losses of biodiversity and ecosystem services like regular rainfall, clean air, and erosion control. These and many other forest-based benefits are vital to the livelihoods and wellbeing of over a billion people around the world.

This brief highlights the findings and recommendations from two forthcoming reports, which identify the first known lessons learned for implementing a “forest-smart” approach to large-scale mining (LSM) and artisanal and small-scale mining (ASM).

## What is forest-smart mining?

The forest-smart concept focuses on landscape-level development efforts that avoid or minimize adverse impacts on forests - and ideally result in a net gain for forest outcomes. These studies aim to support the World Bank Group and its clients in ensuring that mining in forests is a force for poverty reduction and sustainable development, respecting the environment and the needs of communities. Find out more about other forest-smart activities at <https://www.profor.info/content/forest-smart-programs>

## Methodology:

The ASM and LSM studies are based on: **(i)** literature reviews; and **(ii)** case studies representing a range of geographies forest ecologies, mine types, political and governance contexts, and landscapes (including 5 in which ASM occurs with LSM). Lessons learned from this research also informed a third study on biodiversity offset schemes and the challenges of implementing such programs in a way that is ecologically, socially and politically acceptable.

**ASM case studies:** 21 sites across 12 countries and 4 continents

**LSM case studies:** 29 sites across 14 countries and 5 continents, and involving 15 mining companies

For ASM sites, the relative severity of forest impacts is assessed within a 5-km diameter. For both ASM and LSM sites, a forest health index consisting of 12 variables is applied within a 50-km radius.

## LSM AND FORESTS

### Findings:

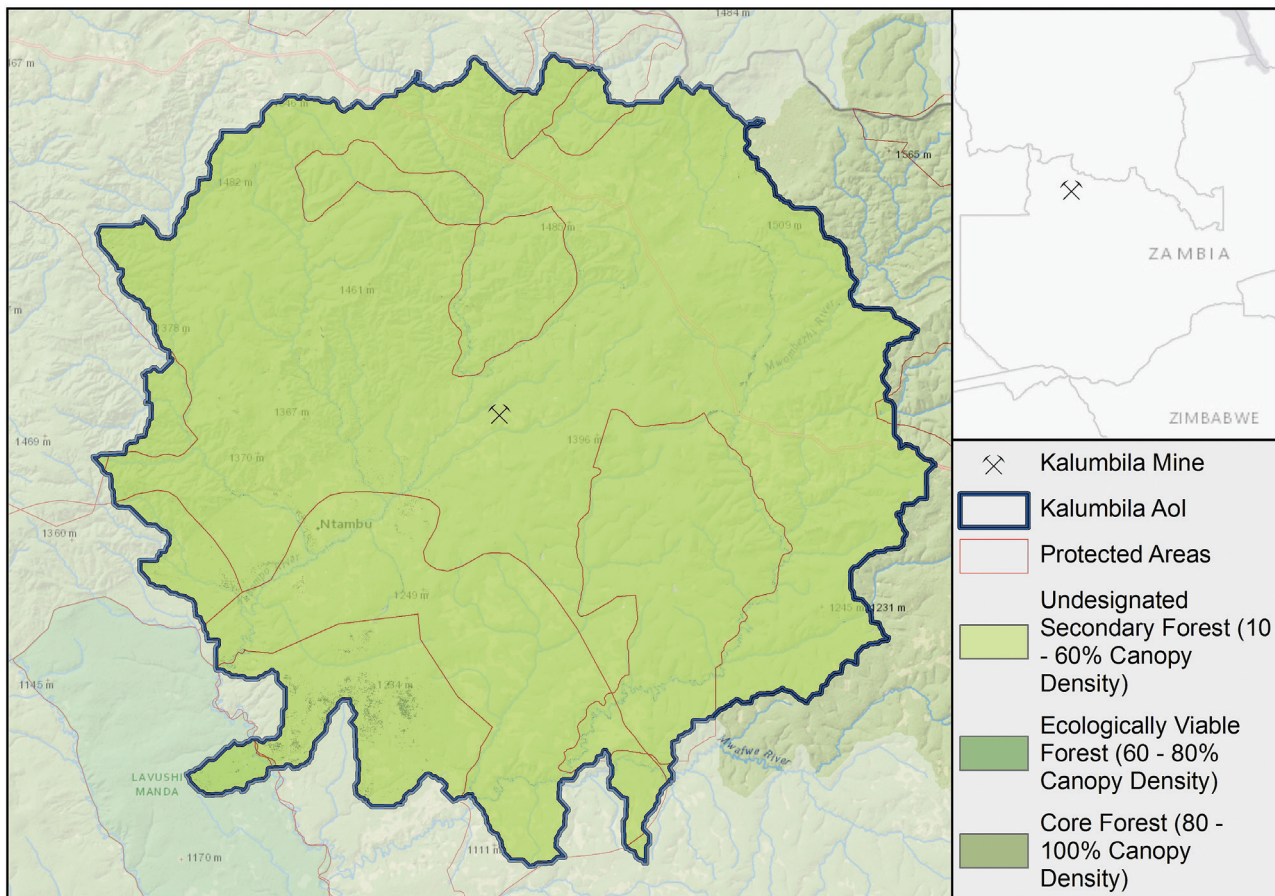
The top three minerals mined in forests are gold, iron ore and copper, while the industries for bauxite, titanium and nickel have the highest reliance on forest mines. There are 1,539 large-scale mines operating in forests today, while a further 1,826 are either in development or currently non-operational. One third of the world's forests occur within 50 km of all these mines. While few mines exist inside protected areas or key biodiversity areas, a large number exist within 50km of such spaces. *(See Map 2)*

LSM's direct impacts on forests are mostly limited to the project footprint. However, associated infrastructure, roads and pipelines can extend direct impacts over vast areas, and indirect impacts can be varied and wide-reaching, particularly for forest-dependent communities. Although most of the case studies demonstrate forest-smart approaches to managing the

direct impacts of LSM, there are very few instances of forest-smart LSM when it comes to handling secondary, cumulative, or landscape-level impacts. In addition, the study does not identify any examples of wholly forest-smart LSM operations. In other words, no project demonstrates forest-smart strategies at every operational phase or fully adheres to the mitigation hierarchy.

Corporate policies on forest-smart commitments vary widely, with no clear relationship to forest impacts on the ground. In many cases, there is a disconnect between corporate commitments and site-level implementation. Other obstacles to implementing forest-smart strategies are weak governance, poor coordination between government departments, and a lack of tenure rights for local communities.

Map 1: Kalumbila and area of impact, including forest cover and protected areas



### CASE STUDY: Kalumbila (First Quantum Minerals), Zambia

The Trident project—a copper mine operated by First Quantum Minerals Ltd. (FQM)— became operational in 2015. The development includes construction of an open-pit mine, processing plant, new power lines from the capital, Lusaka, new tarmac airstrip, maintenance and administrative infrastructure, access roads, and a new residential settlement for the mine workforce and their families. The project is located in an area of primary, intact wet miombo woodland, and is flanked by several protected areas. (See Map 1)

The Kalumbila area represents a prime candidate for improving forest-smart mining practices, which could avoid further opening up of previously remote

forest lands. The Trident Foundation has ambitious goals for projects that reduce impacts on forests, including forming a public-private community partnership to protect local, natural resources. However, more can be done from the operational side to meet the fundamental approaches to forest-smart mining – including adopting the mitigation hierarchy and carrying out a strategic environmental impact assessment. Importantly, since low-grade ore bodies require large-scale operations to achieve a return on investment, the scale of impacts needs to be considered in the mine planning, design, construction, and operation phases.

## LSM Recommendations:

### Governments should:

- **As a priority, strengthen their capacity, collaboration and effectiveness** where it is lacking, including in relevant departments other than those that directly oversee extractive industries. International donors need to support this.
- **Implement legal and regulatory frameworks** that require mining companies to (a) undertake comprehensive Environmental and Social Impact Assessments (ESIAs) prior to mine license approval; (b) show demonstrable financial and other commitment to forest-smart approaches; and (c) be held accountable for implementing mitigation plans resulting from ESIs.
- **Build support for forest-smart mining** by aligning approaches with existing frameworks like the Sustainable

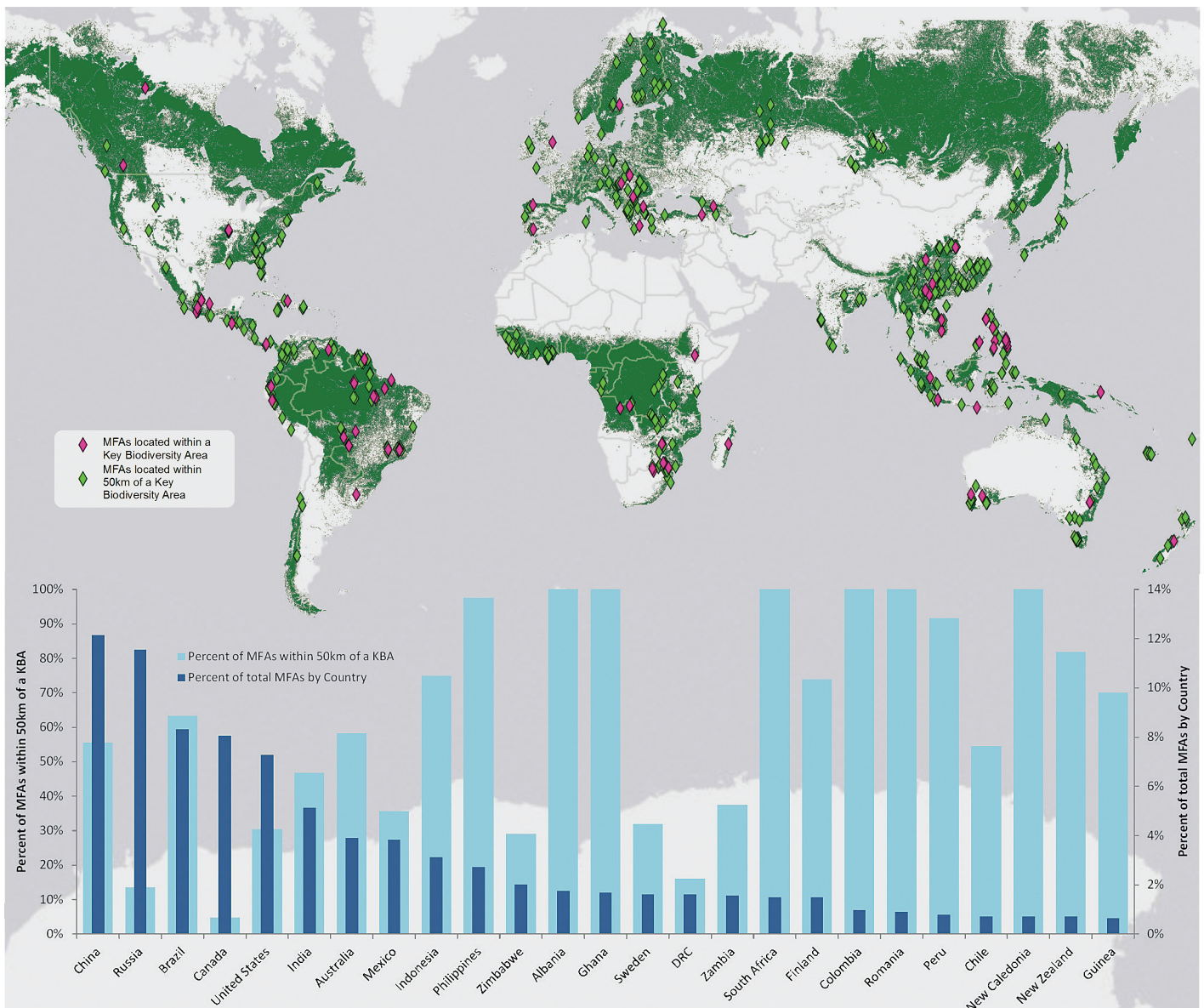
Development Goals, the Paris Agreement, and REDD+.

- **Implement forest-smart regulation** governing mining, forests, water, climate, land use planning, and wildlife conservation, to redress the cumulative impacts on forest landscapes and ensure that local communities and indigenous peoples are represented in the consultation and decision-making processes.
- **If, as a last resort, biodiversity offsetting** is adopted as a forest-smart approach, governments need to ensure that it is supported by legislation and implemented as close as possible to the commissioning phase.

### Mining companies should:

- **Adopt positive targets** like “no net loss” in forest outcomes, or better yet, “net gain,” instead of just “do less harm.” This is especially important in the case of junior mining companies.

Map 2: Large-scale mines in forested areas, inside and within 50km of protected area





- **Strongly consider that not operating in a forest-smart manner comes with considerable potential risks**, which can be minimized by allocating sufficient resources, capacity and commitment to forest-smart operations, including doing so on a voluntary basis in situations of weak governance.
- **Collaborate with corporate foundations**, which have the power to catalyze community in engagement by explicitly incorporating net positive forest outcomes into their charters, as well as by educating communities about the ecosystem services forests provide and communities' dependence on them.

#### **Governments and companies should:**

- **Jointly carry out strategic landscape planning**, including for infrastructure corridors, before new mining projects are approved in forest landscapes. Consideration must also be given to the "no go" option if a project is assessed to cause detrimental effects on biodiversity and ecosystem services.

- **Account for the needs of all potentially affected groups** operating in a forest landscape, including local communities and indigenous peoples.
- **Use the mitigation hierarchy** as the basis for all efforts to reduce LSM impacts on forests.
- **Apply forest-smart approaches** throughout the full life cycle of the mining project, especially the construction and extraction phases where most approaches are not currently being implemented in a forest-smart way.
- **Promote the tenure rights** of local communities in forest landscapes with greater support for forest-smart approaches.

#### **Financial institutions should:**

- **Incentivize forest-smart practices** through safeguards.

#### **Civil society organizations should:**

- **Act as both watchdog and facilitator** of forest smart mining.



*Iron ore mine, Brazil (By Pippa Howard/FFI)*



# ASM AND FORESTS

## Findings

About 70-80% of ASM operations are informal and the sector is often poorly governed, posing a challenge to the application of environmentally and socially responsible practices. The most severe environmental impacts of ASM are not on forests per se, but on soils and water quality. Direct and indirect impacts on forests tend to be relatively minor, with some notable exceptions. Broadly, ASM's impacts on forests are influenced by:

- **Geology:** ASM is more destructive where mineral deposits are widespread and easily accessible. In addition, certain types of mineral deposits are frequently found in tropical regions, increasing the likelihood that ASM takes place in the valuable forest ecosystems of the Amazon and Congo basins.
- **Socio-economic factors:** Although poverty is a driver of ASM (as well as a barrier to its improvement), forests are subject to the greatest impacts in middle-income countries, where mining makes up a greater percentage of GDP and the mining sector is more developed and comparatively better organized. This is presumably because miners in such countries have relatively

greater access to ASM sites as well as to financial credit and mechanized mining tools, which are particularly harmful for forests. Greater forest impacts also tend to be associated with higher unemployment rates.

- **Governance:** Ill-adapted regulations and ineffective enforcement exacerbate ASM impacts.
- **Policy and politics:** Countries may prioritize resource extraction over forest protection, partly due to the unacknowledged economic value of forests, and/or the underestimated benefits derived from protected forests. In addition, unstable political cycles can contribute to fluctuating mining and forest policies, posing a challenge to the implementation of long-term, forest-smart approaches.
- **The presence of LSM:** LSM can both enable ASM and aggravate its impacts on forests.
- **Land tenure regimes:** The lack of formal land tenure systems can lead to a "tragedy of the commons" scenario, with serious impacts on forests. In contrast, the recognition of legal and customary land rights, including



Small-scale alluvial gold mine, Ecuador (Theodora Panayides/Levin Sources)



for indigenous peoples, is associated with lower forest impacts.

- **Pro-forest policies:** Protective policies and programs (like REDD+) that promote forest conservation and/or expansion are linked to better forest outcomes. In fact, effective forest protection is the main determinant of forest outcomes in ASM areas.
- **Evictions of miners:** Efforts to evict ASM operations and settlements from forests appear more effective in low-income countries, but human rights and social justice implications require careful consideration.

It is worth noting that forest impacts do not appear to be influenced by the legal recognition of ASM, or the extent to which countries designate protected areas or impose strong legislation around environmental impact assessments.

### ***CASE STUDY: Ecuador small-scale alluvial gold mining***

The ASM site of San Luis is found in the center of Podocarpus National Park, which is itself part of a global biodiversity hotspot. Mining activities are focused on hard-rock gold and, increasingly, alluvial gold, which is then processed on site using mercury. Earlier LSM operations in San Luis have unintentionally paved the way for ASM, focused on hard-rock gold and, increasingly, alluvial gold that is processed on site using mercury. Repeated evictions appear to have contributed to the decrease in miners over the years. However, insufficient staff and resources prevent park authorities and other government staff from maintaining a stronger deterring presence.



*Small-scale alluvial gold mine, Ecuador (Theodora Panayides/Levin Sources)*



## ASM recommendations

### Governments should:

- **Work with the overall poverty reduction agenda** while ensuring that the regulatory environment of ASM stays ahead of the development of the sector, as impacts of ASM tend to increase with increasing economic prosperity.
- **Improve forest management planning** through greater coordination between mining and environmental sectors; better geological information; greater decentralization of authority to lower levels of government, along with investments in capacity building; and showcasing ASM best practices and, where appropriate, introducing these methods into law.



Gold panning in LTTC-Mandra forest concession, Liberia (Flore de Preneuf/PROFOR)

- **Clarify, in legally binding terms, the definitions of artisanal and small-, medium-, and large-scale mining** and ensure that the environmental requirements are clear, fair, and achievable for each category.
- **Develop and implement clear policies for land use allocation and land ownership**, including the rights of indigenous people.
- **Improve the understanding of where ASM is occurring**, including trends and likely future scenarios and its impacts on forests, to enable better prediction of forested areas likely to be targeted by ASM and a more anticipatory management of ASM-forest interactions.
- **Consider opportunities for positive synergy between ASM and LSM** to enable ASM to perform better on forest impact mitigation. As the stronger partner, LSM is better positioned to positively influence forest outcomes in the landscape, but it needs help in identifying and exploiting opportunities for synergy with ASM.
- **Consider and review the role of protected areas and REDD+ policies**, plans, management, and eviction strategies in limiting the forest impacts of ASM to achieve better forest outcomes
- **Take special care to safeguard comparatively weaker communities/individuals** and those with special rights, as ASM - particularly the artisanal, non-mechanized forms of ASM - are strongly associated with low levels of development, high degrees of poverty, subsistence lifestyles, and in some countries, the presence of indigenous peoples or vulnerable communities.
- **Apply appropriate security and conflict prevention measures** in situations where illegal ASM operations are protected or abetted by criminal activities like money laundering and corruption, which can lead to the militarization of ASM and increased violence.

### International donors should:

- **Assist and strengthen the regulators** of ASM in developing countries, to improve regulation and coordination.