Africa MaVal

WORLD RESOURCES FORUM

Entrepreneurial Spirit, Collaboration and Women's Leadership

Voices from the artisanal and small-scale mining sector in Madagascar

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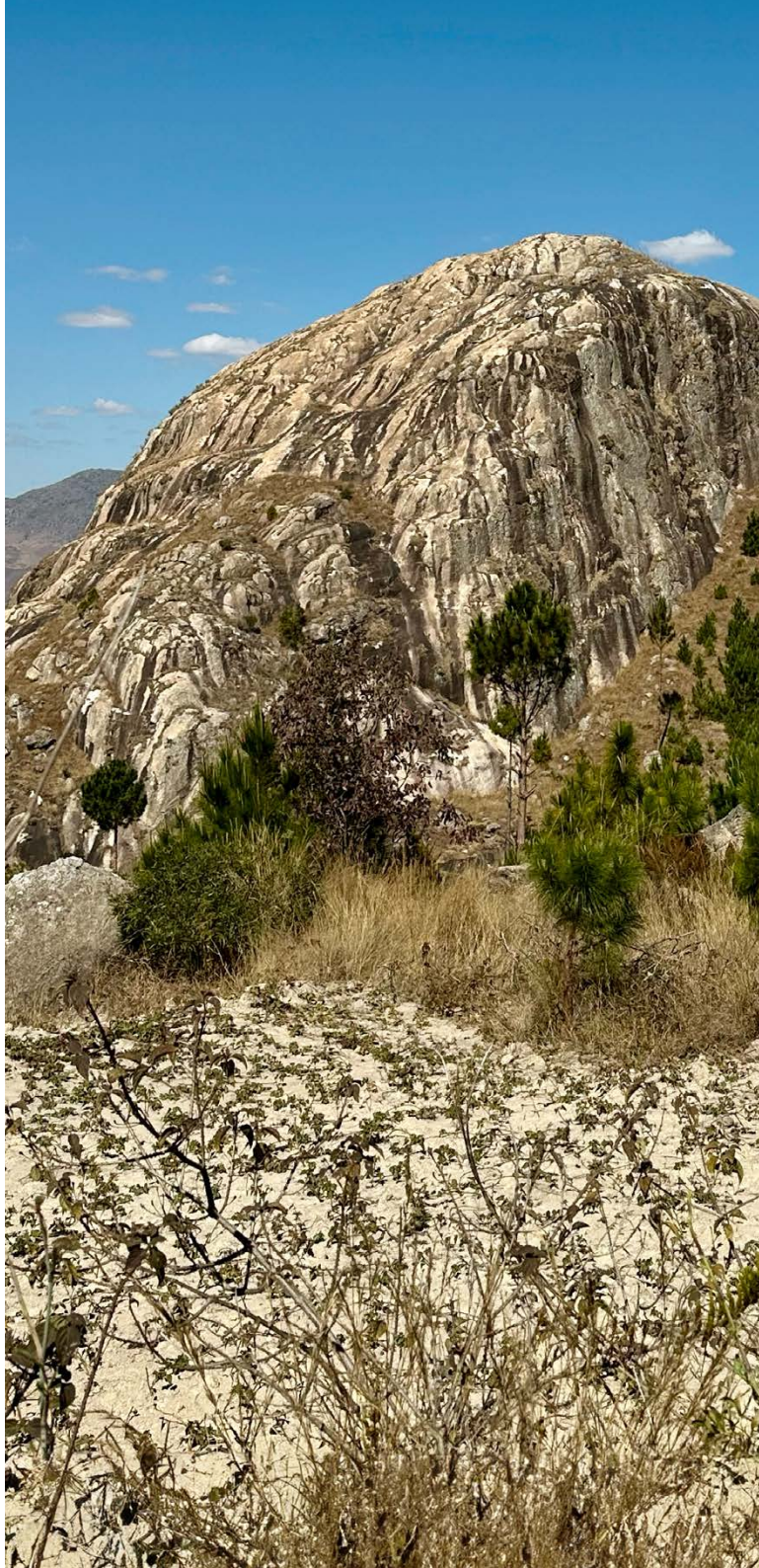


1 Introduction

The artisanal and small-scale mining (ASM) sector: a growing role on the global minerals stage

Around the world there are millions of people working in the artisanal and small-scale mining (ASM) sector, extracting numerous resources that are eventually utilised in the products of our daily lives. It is said that significant quantities of some of the most critical raw materials (CRM), essential for our transition away from fossil fuels and towards green energy and digital technologies, are being mined by the sector. In fact, the ASM sector has been previously called an 'underestimated supplier of CRMs' (IGF 2024), with estimates of 26-, 25-, and 20% of the world's tantalum, tin, and cobalt, respectively, being supplied by the sector (IGF 2017).

ASM generally refers to mining and processing conducted by individuals, groups, families, or cooperatives using manual, labour-intensive techniques. The Organisation of Economic Co-Operation and Development (OECD) defines ASM as 'formal or informal mining operations with predominantly simplified forms of exploration, extraction, processing and transportation' (OECD 2019). ASM is characterised by a low-capital intensive but high labour-intensive technology and includes men and women working on an individual basis as well as in family groups, in partnerships, or as members of cooperatives or other types of legal associations and enterprises involving hundreds to thousands of miners (OECD 2019). The sector tends to be viewed as ore extraction by marginalised communities and often from small, low-grade deposits where the use of large-scale mechanised technologies is not economically feasible. Subsequently, it is often viewed as a subsistence, poverty alleviating activity and as a way of promoting economic development in these communities. Given this, the sector is also generally often associated with poor environmental and working conditions, as well as with an apparent prevalence of child labour (IGF 2017). On the ground realities, however, show a much more complex picture, including many operating in the sector with an entrepreneurial spirit and ambitious goals.

With the current global rush for CRMs, the ASM is not only recognised as a significant source of revenue for millions of people worldwide, but the numbers of people working in the sector are increasing. For example, according to the World Bank, ASM extraction of both cobalt and gold has risen by 7- and 16% since the 1990s and the 2000s, respectively (World Bank 2023; 2024) Furthermore, they estimate the ASM sector makes up the world largest mining workforce, employing more than 13 million people in the resource rich Sub-Saharan Africa alone (World Bank 2024).

Madagascar is one of the poorest countries in Africa and in the world, and it is estimated that more than 75% of the population is living in poverty (World Bank 2023). In recent years, the country has been experiencing a renewed mining boom, partly due to the increasing global demand for CRMs, with actors in the country ranging the entire extraction spectrum, from ASM to large scale operations. It is estimated that the island nation has between 650'000 to 1 million people working in ASM, with 37% of the workers being women (Mitchell 2024; PlanetGOLD 2025). ASM is said to be the second largest employer in the country after the agriculture industry (DELVE 2021). Mining overall contributed up to 4.5% of the national GDP in 2022 (EITI 2022; 2024).

The contribution of the ASM to this figure is unclear given the country does not collect specific data on the sector or their output by commodity, although some suggest that it contributes up to 2% to the GDP. Nevertheless, these numbers are only expected to increase with the continued focus on CRM extraction and the commonly held belief amongst those in the sector is that mining can improve their impoverished living conditions. The government of Madagascar has high hopes for developing the country's large scale mining sector and many Malagasy people working in ASM are hoping their contributions to society and the economy do not go unnoticed.

Malagasy government increasingly recognising the importance of mining

Madagascar is increasing its efforts to spur economic development and ensure a more prosperous future in mining by updating its governance and infrastructure that supports the industry. The government has progressively introduced comprehensive policy packages to reform the sector. This includes updating the mining code, enhanced fiscal and investment measures to make the country more competitive on the international scale, programmes supported by international organisations that support formalisation and professionalisation of the sector, including highly needed infrastructure improvements, a commitment to transparency and revenue redistribution with local benefits (John W Ffooks & Co. 2023; Mitchell 2024; World Bank 2025).

The country is also increasingly recognising the role of the ASM sector in the country. Specifically, in 2023 when the country's mining code was updated, it included provisions intended to assist in incorporating the ASM sector into formal mineral value chains. This includes also commitments by the Council of Ministers to expedite and give priority to artisanal and small-scale mining before exploration and large-scale exploitation concessions (John W Ffooks & Co. 2023).

There has been some ongoing work in Madagascar to operationalise and implement initiatives aimed at formalising the ASM sector, also to enhance value addition (such as gemstone processing) and to minimise any associated, negative social and environmental impacts of their operations. Most of these efforts come from the government's cooperation with international initiatives and organisations, such as projects done together with various UN organisations (e.g., UNEP), the German Development Cooperation (GIZ), the International Institute for Environment and Development (IIED), among others. Although there are these avenues for the ASM to work legally, the majority of the sector still remains working informally or illegally, with the government failing to incentivise individuals to change their status. The primary deterrents to ASM formalisation remain the costs of permitting, accessibility and administrative burden of the whole process being the main barriers (Crawford and Nikièma 2015; Stoudmann et al. 2021). Furthermore, despite these efforts and the ever-increasing importance placed on mining by the government, many working in the ASM feel there is no real strategy specifically for their sector in the country, leaving many feeling frustrated.

Reshaping the understanding and narrative of the sector

Due to its economic significance and its environmental and social impact in Madagascar and elsewhere, it is of paramount importance to understand the dynamics of the sector to come up with effective policies and practices to ensure that ASM contributes to development under high environmental, social and governance (ESG) standards. To transform the sector into a sustainable and inclusive engine of growth for the country, it is necessary to reshape our understanding of the sector by engaging directly with the miners themselves. This ground-up approach is fundamental to capture the nuanced realities, challenges and aspirations of those who work in the ASM sector and the local context in which they operate. By listening to miners' perspectives and comprehending the details of their own operations, policy-makers and other stakeholders can develop a more accurate view of the sector, transcending the solely negative narratives that dominate the discourse (Di Francesco et al. 2024).

Understanding the sector through the miners' lens also sheds light on the diversity within ASM activities, from subsistence-focused artisanal miners to more organised small-scale operations with entrepreneurial aspirations and successes. Each type of operation faces distinct challenges – whether it's in accessing finance, dealing with regulatory requirements, or improving safety and environmental practices. Appreciating these differences allows for more tailored and effective policy interventions that can address specific needs and leverage unique strengths within the sector (Di Francesco et al. 2024).

This is particularly important to keep in mind as the Africa Mining Vision (AMV) aims to transform the ASM sector into a well-regulated, sustainable and economically viable

component of the mining industry. The AMV is a key regional policy framework that was created by the African Union in 2009 to ensure that Africa utilises its mineral resources strategically for broad-based, inclusive development. The vision is that of a minerals sector that harnesses the potential of ASM mining to stimulate local and national entrepreneurship, improve livelihoods and advance integrated rural social and economic development (Di Francesco et al. 2024). While Madagascar has taken meaningful steps to align with the African Mining Vision's approach to the ASM sector in the country, full implementation of this vision is incomplete, especially in the remote regions of the island where many ASM operate.

In this regard, integrating miners' voices into the policymaking process can foster a sense of ownership and accountability among those directly impacted by ASM regulations and initiatives. This participatory approach can lead to more robust and practical policies, as miners provide firsthand knowledge of the realities in the field. It also helps build trust between miners and authorities, which is essential for the successful implementation of any reform (Di Francesco et al. 2024).

By engaging with miners, we can challenge and change the negative perceptions that often overshadow the sector's contributions. Recognising the sector's potential in Madagascar to drive economic growth, contribute to the responsible sourcing of CRMs, empower local communities, and contribute to sustainable development is a crucial first step. Celebrating the positive aspects of ASM, such as its role in local employment and community resilience, can help shift the narrative from one of solely deficit and danger to one of opportunity and development (Di Francesco et al. 2024).

AfricaMaVal and the ASM capacity building in Madagascar

AfricaMaVal is a European-funded project that aims to establish responsible business relations between the EU and African countries by strengthening mineral value chains. A key component of the project is the development of capacity-building programmes to support the ASM sector working on CRMs in improving its ESG performance and integration into formal national, regional, and international value chains.

In August 2024, the second AfricaMaVal training took place in Madagascar, co-organised with the Association of Women in Mining Madagascar (AWIM Madagascar). The programme began with three days of classroom sessions in Antananarivo, covering key topics such as mining regulations, international responsible sourcing frameworks, ESG risks, geology, mining techniques, and the formalisation of ASM activities. Special emphasis was placed on inclusive governance and the role of women in the sector. The training was followed by a field visit to a small-scale lithium mine near Antsirabe, selected for its responsible practices and community collaboration. This hands-on experience allowed participants to apply classroom knowledge, explore lithium mineralogy in the field, and observe how sustainability principles are implemented in practice. Participants included government representatives, members of the Chamber of Mines, mining associations, cooperatives, and individual miners, reflecting strong multi-stakeholder engagement and a shared commitment to improving ASM in Madagascar.

This publication introduces the mineral resources, how they are governed and brings forward the voices of ASM actors in Madagascar. Their perspectives shed light on the realities of the sector and highlight pathways toward a more sustainable, inclusive, and resilient future for ASM. A future that contributes to local economic development and aligns with broader responsible sourcing efforts.

2 Madagascar's Geology and Diversity of Mineral Resources

The geology of Madagascar

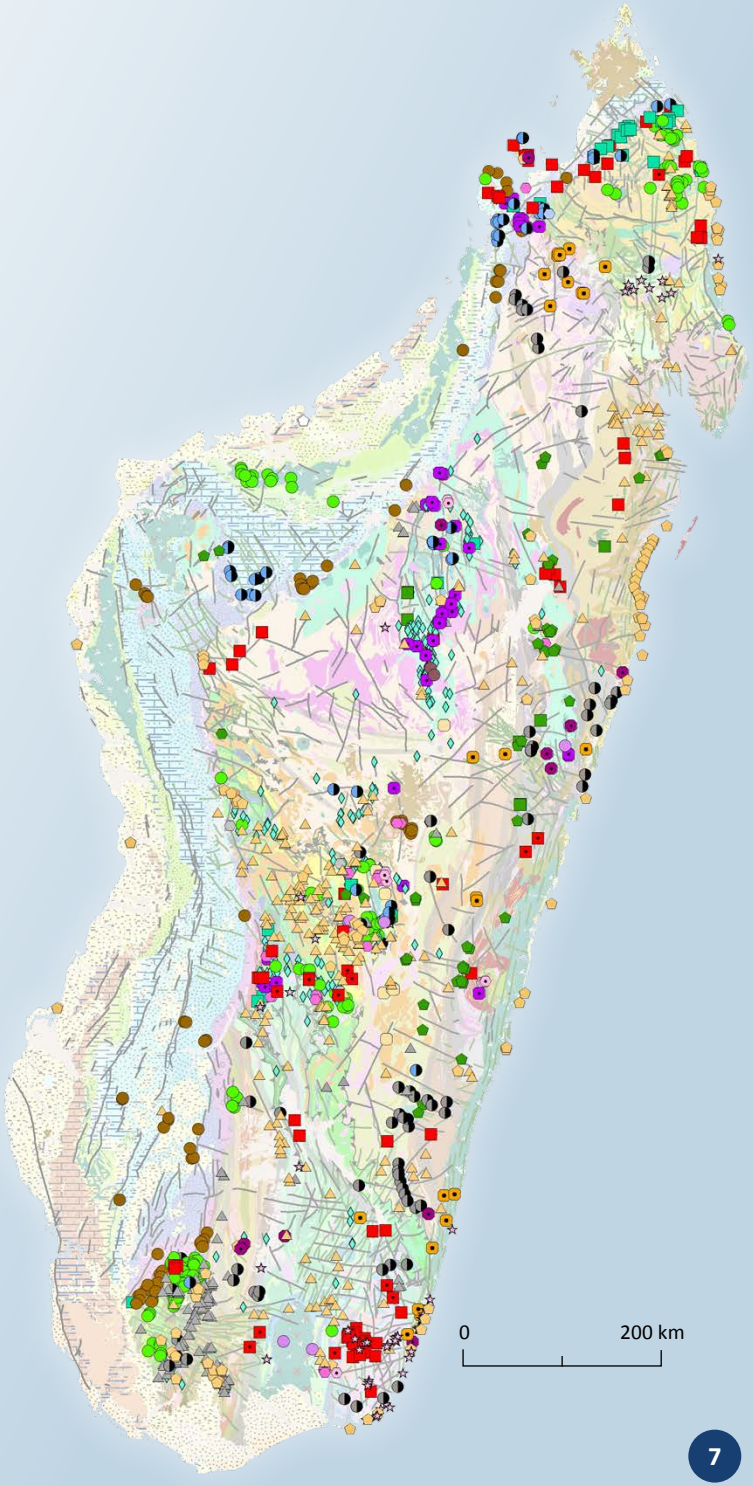
To understand not only the overall mining potential of Madagascar but the potential for a thriving ASM sector, it is necessary to dive into the geological foundations of the country. The geology of Madagascar spans over three billion years of tectonic evolution. This long and complex geological history explains the many resources that are naturally occurring across the country. Major geological events forming the rocks and shaping its landscape included continental collisions, breakups, and plate convergences. Specific tectonic forces leaving geological imprints include the formation of the Precambrian super continent Gondwana during the East African Orogeny and more recently the rifting of Madagascar from the African continent during the breakup of Pangea around 170-85 million years ago (Collins and Windley 2002).

The majority of geological units making up Madagascar date back to these Precambrian times. Madagascar can roughly be divided into three geological domains (Figure 1), the older metamorphic and igneous units found in the central and eastern regions, and the younger, predominantly sedimentary units found in the western third of the island (Collins and Windley 2002). The older units do not compose one terrain, instead smaller faulted terrains separated by unconformities or shear zones and each with a unique geologic history (Collins et al. 2022; Collins and Windley 2002). The rocks of these units were formed at the boundaries of ancient oceans or immense fractures juxtaposing deep mantle rocks over or alongside other unrelated units, all an ensemble of the diverse geologic settings of 3 billion years of the Precambrian (Collins et al. 2022). The younger units in the west are a result of the deposition of sediments ranging from 350 Ma- present.

Extended critical raw materials

Main commodity

Al (Ga)	*Li*	*Sb*
Be	*Mg*	*Sc*
Bi	*Mn*	*Sn*
Brt	*Nb*	*Sr*
Co	*Ni*	*Ti*
Coal	*PbZn (Ge)*	*Tlc*
Cu	*PGMs*	*W*
Fl	*Si (c.l)*	*Zr (Hf)*
Gr	*REE*	



→ *Geologic map of Madagascar with a map of known critical raw materials locations (Picault et al. 2023)*

A snapshot of the diversity of Madagascar's mineral resources

Madagascar is endowed with several important ore deposits, including those of the minerals nickel, cobalt and graphite, essential for battery production. Indeed, there are many occurrences of CRMs across the country, leading some to believe that Madagascar has an exceptional geological potential for further developing their extraction activities. Specifically, the country could be primed to further develop the lithium, graphite, and titanium deposits, not only listed as critical on many countries' list of some of the most economically essential minerals for the future, but those where there is a supply risk. Of economic importance also to Madagascar is the country's gold and vast gemstone and mica deposits.

Lithium

Recently, Madagascar's pegmatites have been in focus for containing minerals bearing lithium (Li), an essential component of lithium-ion batteries. These are one of the most commonly used rechargeable batteries and are considered to be essential for the green energy transition due to their high energy density, ability to hold charge and its superior efficiency. In general, one main lithium containing pegmatite found in Madagascar is the lithium-caesium-tantalum (known as LCT) type pegmatite (Picault et al. 2023). The LCT type are commonly heterogeneous in nature, generally consisting of a quartz core with zones of feldspars and micas where spodumene, petalite, and amblygonite, among other minerals of value are found. A less heterogeneous LCT pegmatite is also found and consists of feldspar rich, flat-bedded deposits also containing spodumene as well as lepidolite (Vasters and Schütte 2023). The majority of these pegmatites are of Precambrian age and were associated with intense tectonic activity.

The lithium bearing pegmatites that are scattered across the central and western regions of Madagascar generally show lower grades of lithium oxide (Li2O) than what is commonly sold on the world market. Some well-known Li-bearing deposits are those of the Berere-Tsaratanana, Vohambohitra, Betsiriry, Antsirabe-Itasy, Ibity-Sahatany, and the Antandrokomby pegmatite fields. Samples collected of lepidolite from the Berere-Tsaratanana and the Ibity-Sahatany pegmatite fields confirmed concentrations of 4.65% and 2.95% Li2O, respectively (Vasters and Schütte 2023). Generally, the majority of pegmatites in Madagascar range from 2-4% Li2O. Despite this relatively low grade, Madagascar pegmatites could nevertheless become an important source of lithium ore, should the global demand for lithium in lithium-ion batteries continue to increase in the coming years.

Graphite

Graphite, like its allotrope-cousin diamond, is a naturally occurring type of carbon (an allotrope is a differing form and crystalline structure of the same element). Graphite is also an important component used in the anodes of lithium-ion batteries, and its demand is expected to increase in the coming years. While synthetic graphite is made as a by-product of the oil industry, it is expensive and has a large carbon footprint from the high energy required for its synthesis. Flake graphite on the other hand, is also found naturally occurring mostly in high-grade metamorphic terranes often from the deformation of sedimentary rocks, such as mud and siltstone. Graphite is resistant to high temperatures, oxidation and corrosion, and has a high thermal and electrical conductivity (Keeling 2017). Madagascar is already home to well-established graphite extraction activities. Indeed, Madagascar holds approximately 8% of the global graphite reserves and accounts for 6% of the global production (AMDC 2025).

The country's world class Molo graphite deposit consists of high carbon purity (>97% C) flake graphite in southern Madagascar. It is found in the Tolagnaro-Ampanihy high grade metamorphic province, situated in what is known as the Bekily block, a unit of leptynites, or a gneiss-like rock. There is one operating mine extracting the graphite of this terrane and it is estimated to have greater than 30 year life of the current mine and with greater than 100 years of potential extraction of the graphite deposit itself (NextSource 2025; Erudite Strategies 2023). It is safe to assume that as long as there remains a market demand for graphite, Madagascar will continue to be an important source for this critical mineral.

Titanium

Another material that is actively mined in Madagascar is ilmenite, an ore mineral of the CRM titanium. It is primarily used in the aerospace field, as well as in defence for armour, chemical manufacturing, pigments and paints, and in medical devices among other applications and is also considered a critical raw material by the European Union (USGS 2024). In 2023, Madagascar was also one of the top 6 countries sourcing the United States with ilmenite for titanium (USGS 2024).

Currently, the most active extraction of ilmenite is occurring also in southern Madagascar from the Mandena deposit of heavy mineral beach sands close to the coast. It is said to be the world's largest reserves of ilmenite, with a reported 1900 Mt of minable sands. The source of the ilmenite is thought to be a geological terrane known as the Manangotry Massif in the Anosyan Domain, composed of marbles, pyroxenite and gneisses (Holder and Hacker 2019; Chadirji-Martinez et al. 2024). Of particular importance of the heavy mineral sands of the Mandena is the elevated concentrations of the radioactive element

thorium and uranium, which poses significant environmental challenges.

Gold

As in many countries in Africa, Madagascar is host to gold deposits, found both in primary, such as igneous and metamorphic bedrock terranes, and secondary sources disseminated in placer deposits accessible via the many creeks and rivers that drain these regions. Much of Madagascar's gold has been fluvially transported and deposited away from the original source, which may not be known. It has been previously stated that the amount of placer gold recovered on the island nation, greatly exceeds that of any discovered bedrock source (Pitfield et al. 2010), suggesting that Madagascar continues to have the capacity for gold extraction. The known gold containing bedrock are distributed throughout the northern, eastern, central and southern regions. In the north and east, gold is associated with greenstone belts, such as the Maevatanana goldfield, where quartz– sulphide – gold veins crosscut Proterozoic banded iron formations (Andrianjakavah et al. 2007). Other notable deposits include those of the granitic and metavolcanic basement rocks of the Vohilava–Ampasary and Andrarona gold deposits in the southeast, and the skarn associated deposits of the Betsiriry and Itea regions of central-western and south-central regions.

Gemstones

Many know Madagascar for its vast deposits of precious and semi-precious gemstones. Best known for its exquisite corundum species of sapphires and rubies, the country also produces beryl species of emeralds and aquamarines, as well as a wide variety of garnets and tourmaline. Found in a diversity of geological terranes with distinct lithologies and petrogenesis, gemstones are found all over the country (Rakotondrazafy et al. 2008). The majority of the sapphires and rubies come from metamorphic granulite facies, metasomatized pegmatites, or skarn deposits of Precambrian age in the eastern two thirds of the island, with a high concentration of deposits in the south. No corundum deposit is more famous than the Ilakaka mining region in the south. Ilakaka was the first giant alluvial sapphire and ruby deposits to be found in Madagascar and has been actively mined since its discovery in the late 1990s (Rakotondrazafy et al. 2008).

Mica

No discussion of the geology of Madagascar is complete without the discussion of the role that the mineral mica has played in the economy. While not a critical raw material but rather an industrial mineral, mica is primarily used as an additive in paint, roofing and rubber products and in the cosmetic industry. Indeed, there continues to be large, exploitable deposit of mica on the island (USGS 2024). As with other ore minerals, the phlogopite mica deposits' geologic origins can be traced back to the high-grade metamorphic terranes of Madagascar. An important mica deposit is found in the Beraketa district also of southern Madagascar. Here the mica deposits are situated within the schists, granitoids and leptynites-gneissic rocks of the Bekily Block (Martin et al. 2014; Rakotondrabe et al. 2020). In the region of the former Ampandrandava mine, phlogopite mica, form large euhedral crystals and is often found together with calcite.

3 The ASM Sector in Madagascar

Like many countries in Africa, Madagascar has an extensive history of artisanal and small-scale mining. It is well known that the ASM sector has long been active in the country, with the sector extracting precious metals and stones going back more than a century (DELVE 2021). Today the sector actively extracts critical materials, semi to precious gemstones, and industrial minerals. Workers in the sector generally fit into one of two classifications: those that are permanently involved in extraction, whose sole income is derived from ASM activities; and those who are migratory or participate in a "rush", whose primary source of income comes from agriculture and only seasonally participate in mining during the dry months or when there is a rush. For instance, large influxes of people take up ASM due to a newly discovered minable deposit of higher value (Stoudmann et al. 2021). Mining thus attracts both types of workers by the view of possible improved household incomes as compared to only working in agriculture that leave many in impoverished living conditions (DELVE 2021).

The majority of the gold in the country is mined by the ASM sector (ASGM). There are an estimated 600'000 people employed directly by gold extraction with a further 2.5 million people who are indirectly employed by ASGM (PlanetGOLD 2025). Thus, about 8% of the population makes their living in some way by ASGM activities in the country, producing an estimated 14 tonnes of gold annually (PlanetGOLD 2025). The sector still relies heavily on mercury for gold extraction, though Madagascar signed and ratified the Minamata Convention, for the reduction of the use of mercury and was the first country to submit a national action plan to reduce and, where possible, eliminate mercury use by the ASGM sector (UNEP 2025). For the period between 2018 – 2020 Madagascar exported about 6.7 tons of mostly ASGM produced gold, with a total value of about 257 million USD (Vasters and Schütte 2023).

The ASM sector in Madagascar is thought to be extracting the majority of the country's yearly exports of (semi-) precious gemstones, with only a small portion coming from industrialised operations (USGS 2022). However, due to the government's a lack of recorded data on the sector's yearly production and volume, it is difficult to know the exact numbers of people working in the sector. However, there are numerous reports of tens of thousands of people across the country exploiting from makeshift tunnels within or sieving the gravels of the rivers draining country's known gemstone localities (Lawson 2018; Lawson and Lahiri-Dutt 2020; Zaugg 2024b; 2024a). Moreover, these regions are some of the poorest in the country with low rates of education and an overall lack of opportunities, especially for women (Koigi 2018). It is often noted that there are specific roles of both men and women in gemstone extraction, with women often restricted to roles that are perceived as having less value, such as sieving and washing ore, where men typically dig ore in the mines. There are many reports of women working under extreme socio-economic conditions, filling both household- and mining-related roles as well as children who are often seen assisting their families (Zaugg 2024b; 2024a). Between 2018 and 2021 it has been reported that the (semi-) precious gemstone extraction sector in the country was valued between 30 – 40 million USD, with the total value for that period at an astonishing 126 million USD (Vasters and Schütte 2023).

Mica in Madagascar has been vital for lives of the artisanal and small-scale mining communities who almost exclusively mine it using artisanal, non-mechanised techniques. For decades it has been an enormously important source of revenue for the sector. The majority of the mica deposits that the ASM sector is extracting are located in the south, in some of the most remote and poorest provinces in the country with major accessibility issues due to a lack of paved roads (Canavesio 2014). A lack in infrastructure contributes to the isolation of the region, exacerbating the economic struggle for the ASM community. Furthermore, child labour, poor working conditions, lack of access to education and health care and compounded by a lack of access to governmental social services are common to this sector (RMI 2025b). However, given these challenges, it is said that between 2017 – 2021 Madagascar still exported about 216,000 tons of mica products with a total value of about 46 million USD (Vasters and Schütte 2023).

There are several other CRM deposits across the country that may be or are currently suitable for ASM extraction. Presently the sector is extracting the lithium bearing minerals from the country's pegmatites, as well as the associated minerals columbite and tantalite, (also known as "coltan", important sources of the CRMs niobium and tantalum) in small quantitates (Vasters and Schütte 2023). Ore minerals containing manganese are also said to be mined by the sector from the Ampanihy region and sold directly to foreign buyers (Vasters and Schütte 2023). Furthermore, it has been said that both the minerals bastnaesite (CRM bearing rare earth elements) and celestine (CRM

The potential for value addition in the gemstone sector in Madagascar

There exists a significant potential for capacity building and trade skills development, specifically for women involved in ASM gemstone extraction in Madagascar. While most gemstone value addition still happens outside of Madagascar, over the last several years, there has been some small projects gaging the interest in capacity building in the field of gemstone trade and the practice of lapidary arts of the local ASM workforce. For example, international organisations such as the Gemmological Institute of America (GIA) and PACT and in collaboration with the Madagascar Ministry of Mines and other local organisations recently held training programmes that were aimed at strengthening the technical capabilities and empowering the ASM through education on precious stones (Moov 2024). The goal was to support the sustainable development of the country's gemstone ASM extraction sector and for improvements of responsible management of mineral resources.

Additionally, leading researchers from the University of Queensland have previously looked at the pathways, opportunities and challenges of women working in the sapphire value chain in Africa (Levers 2018) and used the knowledge gained to create a basic field gemmology course for the local Malagasy women working in ASM gemstone extraction. They found training in mineral identification and in using simple tools such as geological loupe, tweezers and provided a guidebook in the local language, greatly improved the sale and negotiating skills of women miners in the sector (Lawson and Lahiri-Dutt 2020; Levers 2018). Such efforts, together with those supported by the Association of Women in Mining Madagascar (AWIM), who conduct projects, such as their Project MIABO, promote value addition and invest in training the women in sapphire mining. Such small investments can already have large impacts on improving the lives not just of those in the gemstone extractives community but others working in ASM of other commodities in Madagascar.

bearing strontium) were mined by ASM in the country in the 1960s – 1980s, with still a potential for further deposit exploitation by the sector (Vasters and Schütte 2023).

The legal framework governing the mining and ASM sector in Madagascar

The Mining Code of Madagascar (Law No. 99-022, enacted in 1999) has long served as the cornerstone of the country's legal framework governing mining activities. It applies to all operations, from large-scale industrial ventures to small-scale and artisanal mining, defining procedures for licensing, environmental compliance, and overall sector regulation (Sewpershad and Tufo 2024).

Despite its comprehensive nature, the 1999 code posed significant challenges for ASM operators. Many artisanal miners work informally and have found the regulatory requirements difficult to meet, which has limited the uptake of legal permits in the sector. To address these barriers and other evolving sector needs, the Malagasy government initiated a long-awaited revision of the Mining Code. Following delays caused by administrative reshuffles and political uncertainty, without a Minister of Mines for a while, the reform process resumed momentum in 2022. In April 2023, a draft version of the revised Mining Code was validated by the Council of Ministers. The code was finalised in July 2023, and its implementing decree was completed in May 2024. The revision sought to modernise the legal framework and improve governance in response to multiple sectoral needs. It aimed to attract greater investment, increase state revenues, promote sustainable development, and formalise ASM operations (Sewpershad and Tufo 2024).

One of the key goals of the revised code is to simplify the process of acquiring mining permits. This is especially important for ASM miners, who often face administrative and financial hurdles in securing legal recognition. The revised code introduces mechanisms to streamline licensing, improve accessibility, and reduce delays, with the hope of integrating informal miners into the legal economy (Sewpershad and Tufo 2024).

In practice, however, implementation has proven challenging. Over the past year, miners, particularly in the ASM sector, have reported long waiting times to obtain permits. These delays have been partly attributed to a lack of clear institutional processes and the aforementioned changes in ministerial leadership.

As mentioned, one of the ways the revised mining code intends to promote formalisation and improvements in the ASM sector is via the permitting process. It upgrades the 'mining authorisation for artisanal exploitation' (fr. Autorisation Minière d'Exploitation Artisanale; AMEA) permit that allows legal artisanal mining in return for a fee if the

applicant submits an environmental commitment plan. The AMEA is granted in specific artisanal mining corridors and are valid for 6 months and renewable once for the same duration (Sewpershad and Tufo 2024). This authorisation can then be converted to a 'permit reserved for artisanal operators' (fr. Permis Réservé aux Exploitants Artisanaux; PREA) that now comes with refined terms, such as a coverage area of 50 km^2 and is valid for eight years with possibilities of renewal twice for a total of an additional eight years (BCMM 2025b). Additional application criteria clarify that the permit can include allowing individuals or groups to carry out prospecting, research, and small-scale mining using artisanal methods or light machinery (Sewpershad and Tufo 2024; Vololoniaina 2025). The AMEA intends to give the ASM sector a pathway into formalisation, before converting the AMEA to the PREA permit (Sewpershad and Tufo 2024; Vololoniaina 2025).

The new permitting process has some nuanced details that have the potential to leave some working in the ASM sector confused. For example, in the new mining code there are no restrictions for the AMEA permit holders on the depth to which they can mine (BCMM 2025b), given this is a relatively short term permit. However, in annex E, or the Environmental Commitment Plan of the PREA permit states that these permit holders may only extract ore and dig to a depth of 20 meters (BCMM 2025a). Given that AMEA permit holders are encouraged to eventually apply for a PREA permit, many working in the sector are confused and frustrated by these depth limitations and perceive these new changes to the mining code as favouring the more formalised miners. In light of the difficulties for many in ASM in accessing finance and thus inhibiting their goals of professionalisation of their operations, such depth restrictions could indeed limit the earning potential of PREA permit holders. Beyond licensing, the revised code emphasises social and environmental responsibility. It incorporates stronger provisions for community development, environmental protection, and equitable benefit-sharing. These reforms are intended to foster more sustainable mining practices and align with national development goals (Sewpershad and Tufo 2024).

The institutional architecture supporting mining governance in Madagascar has also been reinforced. The Ministry of Mines and Strategic Resources (MMRS) remains the principal authority, responsible for issuing permits and developing sector policy. It works alongside the Ministry of the Environment and Sustainable Development (MEDD), which oversees the decisions regarding environmental permits and the management of protected areas. Additionally, the Madagascar Mining Cadastre Office (BCMM), manages the allocation of permits and the national mining cadastre (Sewpershad and Tufo 2024).

Among the most noteworthy institutional innovations in the revised framework is the Mining Brigade (Brigade minière) responsible for policing mining activities, including uncovering and covering mining offences. The bill proposes also a National Mining Fund that should earmark a portion of mining revenues for local development and environmental management, aiming to ensure that the benefits of mining reach communities on the ground (Sewpershad and Tufo 2024).

While the revised Mining Code lays an ambitious foundation for a more transparent, inclusive, and sustainable mining sector in Madagascar, its success will depend heavily on how effectively it is implemented. Continued political will, institutional clarity, and timely administrative processes will be key to realising the code's full potential, particularly for the country's many small-scale and artisanal miners.

International frameworks for responsible sourcing and their relevance for ASM in Madagascar

Deep-dive

Growing global concern over the environmental and social impacts of raw material extraction has led to increased pressure on companies to adopt responsible sourcing practices. Policymakers, investors, industry groups, civil society, and consumers are demanding transparency, traceability, and accountability throughout mineral supply chains. As a result, numerous international, regional, and sectoral initiatives have emerged to guide businesses in addressing ESG risks. These range from broad sustainability principles to voluntary and regulatory frameworks, standards, and reporting templates for specific commodities or activities. Stakeholders involved in these frameworks vary widely and include international institutions, national governments, industry bodies, individual companies, and civil society actors (Farooki et al., 2023).

Key international frameworks include the UN Guiding Principles on Business and Human Rights, the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas, the ILO Tripartite Declaration on Multinational Enterprises and Social Policy, and the OECD Handbook on Environmental Due Diligence in Mineral Supply Chains (2023). These tools provide states and companies with guidelines to manage ESG risks and promote responsible practices across value chains.

More recently, the European Union has taken steps to embed due diligence obligations into legislation. The Corporate Sustainability Due Diligence Directive (CSDDD), adopted in 2024, will require large EU companies and non-EU companies operating in the EU market to identify, prevent, and mitigate adverse environmental and human rights impacts across their operations and value chains, including the sourcing of raw materials such as critical minerals. Meanwhile, the Critical Raw Materials Act (CRMA), in force since May 2024, introduces sustainability, circularity, and environmental footprint criteria, as well as enhanced recycling and traceability obligations for critical raw materials. At the same time, the EU is considering an "Omnibus" package of proposals intended to simplify and align sustainability reporting and due diligence rules, which may shape how these obligations apply in practice.

There are several initiatives in Madagascar with the aim of supporting the implementation of responsible sourcing. For example, the Responsible Mica Initiative (RMI) in partnership with the Alliance for Responsible Mining (ARM) have developed the Mica CRAFT Code, a voluntary sustainability standard and framework designed to address the challenges of ASM mica sector (ARM 2025; RMI 2025a). Further, the Malagasy government has created a National Committee Against Child Labour (Plan National d'Actions de Lutte contre le Travail des Enfants) (Ralaiarijaona 2025), has created clearer guidelines and stricter legal obligations for social and environmental responsibility for permit holders as well as establishing a specific section under the Ministry of Mines and Strategic Resources that oversees the ASM sector and their responsible sourcing efforts.

These frameworks are reshaping global market expectations. Companies and investors are less likely to engage with mining operations, particularly in the ASM sector, unless they meet minimum ESG standards and are formally integrated into traceable supply chains. This poses both a challenge and an opportunity for Madagascar, where ASM is a major source of livelihoods and minerals such as gold, sapphires, and lithium.

To access international markets and attract responsible investment, Madagascar's ASM sector will need to align with global standards. Formalisation efforts, stronger environmental and social safeguards, and clearer regulatory frameworks are key to ensuring that ASM operations are recognised as legitimate and sustainable actors in global mineral supply chains.

4 Voices from the ASM Ecosystem

Following an overview of the state of mining in Madagascar, this chapter highlights perspectives of key stakeholders involved in the country's ASM sector. These interviews provide insights into challenges, opportunities and dynamics shaping ASM in Madagascar, offering a multi-dimensional view of the sector beyond the miners themselves. Despite facing regulatory uncertainties, market fluctuations, and limited access to resources, miners continue to adapt and thrive, demonstrating remarkable entrepreneurial spirit. Their stories reveal not only the challenges they overcome but also the opportunities they create for themselves, their families, and their communities.

The interviews presented here were conducted as part of the AfricaMaVal ASM capacity building in Madagascar, aiming to raise awareness of the complex and nuanced realities of the sector. They represent a diverse set of stakeholders, including government officials, association representatives, a student, professionals advocating for women in mining and experienced small-scale mining entrepreneurs with some even holding a large-scale mining license. The miners are working with a broad range of minerals, including lithium, graphite, mica, coltan and others. Their experiences illustrate the interconnected ecosystem that supports and regulates ASM in Madagascar, encompassing policy, community engagement, gender inclusion, market access, and technical expertise.

The interviews cover a variety of topics, including:

- **Women's Leadership in ASM –** Highlighting the experiences of female mining entrepreneurs and their impact on the industry.
- **Overcoming Challenges with an Entrepreneurial Mindset –** How miners navigate barriers, adapt to market demands, and create opportunities for growth.
- **The Power of Collaboration and Community Engagement –** The role of local networks, partnerships, and collective efforts in strengthening the ASM sector.

While each interview brings unique insights, common challenges such as financial access, value addition or regulatory hurdles emerge across the sector. Together, these voices provide a comprehensive view of Madagascar's ASM ecosystem, highlighting both the hurdles and the opportunities present in the sector.

→ Empowering women in ASM

My name is **Eulalie Tanteliniony,** and I have been working in the environmental and social field in southern Madagascar for nearly 25 years, focusing on capacity building for local communities and authorities. I hold a master's degree in geography, specialising in protected areas and small-scale sapphire mining, and later studied environmental management in mining in Australia on a scholarship. My journey with women in mining Madagascar began in 2016 when I participated in a capacity-building programme at the University of Queensland. After returning, I led a short project training women miners in jewellery-making using low-value minerals. In 2019, I joined a workshop in Ghana, where I connected with the African Women in Mining network. Inspired by this, I helped establish the Association of Women in Mining Madagascar (AWIM Madagascar).

What is the purpose and vision of AWIM Madagascar?
Eulalie: AWIM Madagascar aims to overcome the overlooked gender perspectives in the mining sector in many parts of Africa. Our platform represents women in mining, ensuring their voices are heard and they can participate in decision-making at all levels. While there is still progress to be made, we continue to push forward, advocating for women's rights, improving livelihoods, and influencing policies in the sector. Our members, many from rural areas, are empowered to build confidence, improve their work, and support their families. We focus on helping them stand against discrimination by equipping them with knowledge of their rights, so they no longer accept injustices in their communities.

"While there is still progress to be made, we are determined to push forward, advocating for women's rights, improving livelihoods, and influencing policies in the sector."

What role do women play in Madagascar's ASM sector?
Eulalie: Women make up about 30% of those directly working in mining, but if we include indirect roles, their presence surpasses that of men. However, traditional beliefs often limit their opportunities. While women take on various roles, it is widely believed they should not enter mining pits – some say it brings bad luck, while others claim it is simply not a place for them. As a result, women often work in lower-yield areas or process materials mined by men.

Discrimination also extends beyond the mine site. In one case, a woman miner who employed workers found a valuable stone but was unable to sell it herself—no shop would buy from her because she was a woman. She had to give the stone to her brother to sell on her behalf. Overcoming these barriers is crucial to ensuring equal opportunities for women in the sector.

Is AWIM Madagascar open to male members?
Eulalie: Yes. From the beginning, we chose to allow men to join AWIM Madagascar to ensure inclusivity and encourage allies in our fight for gender equality. However, many men hesitate to join because of the name "Association of Women in Mining," assuming it is not a space for them. While our primary focus is on empowering women, our efforts benefit the entire sector. We advocate for fair treatment and equal opportunities, which ultimately create a more just and inclusive mining industry for both women and men.

How do you see the future for ASM in Madagascar?
Eulalie: That's a great and difficult question. Many ASM activities in Madagascar remain informal or even illegal, often because people don't realise, they are breaking any rules. Mining has been a way of life for generations. We hope for stronger collaboration between civil society, local communities, and authorities to better manage the sector. With the right approach, ASM can not only improve livelihoods and create opportunities but also contribute more revenue to the government for broader development.

"We advocate for fair treatment and equal opportunities, which ultimately create a more just and inclusive mining industry for both women and men."

→ Championing gender equality

My name is **Zo (Herizo Harimalala Tsiverisoa)**, and I am a geologist with nearly 15 years of experience in Madagascar's mining sector. I studied geology at the University of Antananarivo and later received an Australia Awards Scholarship to pursue development studies at the University of Melbourne. After more than a decade working in the mining sector, I realised that despite its presence, mining had little tangible impact on Madagascar's economy and overall quality of life. This motivated me to study in Australia, a country that has successfully integrated mining with biodiversity conservation—something Madagascar also needs. I wanted to learn from their approach and bring that knowledge back home. Returning to Madagascar was never a question for me; it was both a commitment and a personal mission to contribute to a more sustainable and beneficial mining sector.

■ *What has your experience been like as a woman working in the mining sector in Madagascar, and have you faced any gender-related challenges?*
Zo: Working as a woman in Madagascar's mining sector initially felt normal to me, as I grew up in a conservative, patriarchal culture. But after spending time in Australia and later working in Eastern Africa, I became more aware of the gender inequalities we often accept as the norm. Even in international companies with strong standards, traditional Malagasy views still limit how women are perceived. I've been told I shouldn't stand in front of men, regardless of my position, and I often feel that my words would carry more weight if I were a man. These experiences made me realise that change is possible—and needed.

■ *How can the situation for women in mining be improved, and what steps are needed to advance gender equality in Madagascar's mining sector?*
Zo: To change the situation for women, education is key. My own experience of stepping outside my comfort zone opened my eyes to new possibilities. I want to help other women gain similar experiences. Providing more opportunities for women, especially in our conservative and patriarchal culture, is crucial. We need to encourage girls to take on leadership roles step by step. Change won't happen overnight, but starting with small steps is essential.

■ *How can associations like AWIM Madagascar contribute to the development of gender equality in the mining sector?*
Zo: AWIM works on two fronts. First, we focus on education, organising workshops and awareness events on topics like gender-based violence, laws, regulations, and technical skills to empower women and communities. Second, as an association of women, we advocate for women's leadership roles and push for gender equality in decision-making, especially in mining companies. We also raise awareness about creating safe, respectful spaces for women, such as improving facilities like toilets and washrooms in mines to ensure everyone feels secure and comfortable.

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■ *Do you see a shift in the dynamics between men and women, boys and girls, in terms of equality, especially for younger generations?*
Zo: Yes, there's a positive shift. For example, when I was in engineering school 20 years ago, there were only three girls out of 10 students studying geology. Now, it's nearly 50/50. Back then, people said it wasn't a job for women due to safety or cultural reasons. Today, there's growing support for girls to pursue these fields, showing a change in mindset. This generation increasingly understands that no job or field is exclusively for men, which gives hope for the future.

To be continued on the next page →

■ *How do you envision the future for ASM in Madagascar?*

Zo: I'm divided. ASM in Madagascar holds huge potential. The people in this sector are dynamic, ambitious, and capable of succeeding. However, political issues remain a barrier. Currently, the government's focus is on large-scale mining, but I believe it's time to recognise ASM's potential and its ability to contribute significantly to the economy, both directly and indirectly.

■ *What role do you think women could play in addressing the issue of child labour, particularly through education and family planning?*

Zo: Family planning is crucial. In Madagascar, there's a cultural belief that saying no to having children is rejecting blessings. However, we can promote family planning as a way to manage how many children a family can afford. Women can play a key role in raising awareness, teaching that planning for the future of the family is essential, not only for the mother's well-being but for the children's future too. This approach would help address the issue of child labour in the context of poverty.

Info Box: Women in the ASM sector

Deep-dive

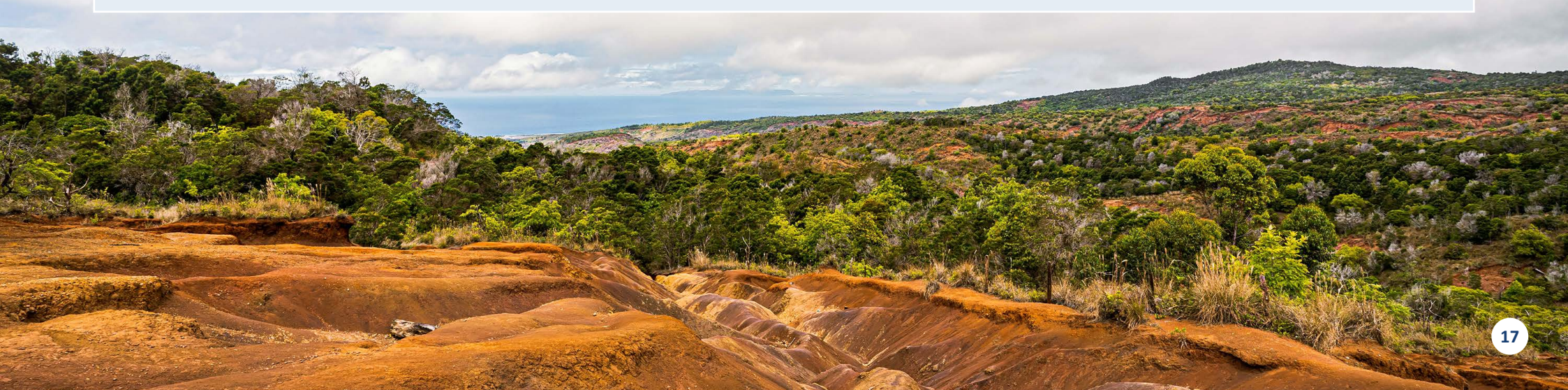
Women comprise a significant and growing segment of the artisanal and small-scale mining (ASM) workforce. Globally, women represent between 18% and 50% of ASM workers, depending on the region and source (DELVE 2021; IGF 2018). In Africa, their representation can reach up to half of the ASM workforce.

In Madagascar, while comprehensive statistics are limited, women are known to be highly active in ASM, particularly in gold and gemstone mining regions. Their roles span from mineral extraction and processing to trading and supporting community livelihoods.

Women's involvement in ASM contributes significantly to household incomes and community resilience, while also offering pathways for empowerment and gender equity. However, Malagasy women face a number of persistent challenges: limited access to mining permits and land, inadequate financial services, or traditional norms that restrict their control over earnings.

Moreover, women in ASM often face poor working conditions, including inadequate sanitation, lack of safety measures, and unequal pay. Despite these challenges, they continue to play a vital role in sustaining mining economies and supporting their communities.

Encouragingly, women miners in Madagascar are beginning to organise themselves. Initiatives such as AWIM Madagascar are helping to build capacity, connect peers, and advocate for more inclusive policies. These efforts are essential in driving forward a more equitable and sustainable ASM sector in the country.



→ Empowering communities through mining*

My name is **Kanto Andrianina Rakotondramanana**, and I am working as communications manager for a small family business in Madagascar. I studied political science but later chose to join the family business to help my grandparents and parents while bringing innovation to our operations.

Our company focuses on mining, transforming and selling minerals especially petrified wood and we are now trying to accede to international trade. I also run a cultural association that supports disadvantaged populations, and I am a member of AWIM Madagascar, as I am deeply committed to social causes and believe in the potential of the mining sector to help local communities.

■ *What is your aspiration for the future? Why are you still in the mining sector, even though you know there are many issues?*
Kanto: Sometimes, I really want to give up. But I know that the mining sector is a crucial pillar of development for Madagascar and for local communities. In the past, I have always worked on social issues, helping underprivileged populations—I even run an association dedicated to that. As a member and secretary of AWIM Madagascar, I believe the mining sector can do a lot for local communities, which is why I haven't given up.

■ *Do you have a positive mindset when attending trainings like this? Do you see possibilities to work together to solve these issues?*
Kanto: Yes, definitely. This workshop has provided me with valuable information, especially on laws and regulations, which is often inaccessible to us. I've also realised that various groups can collaborate to address these challenges together. This is a positive step forward. Initiatives like AfricaMaVal also support these efforts, making it a great opportunity for Malagasy operators to better develop their activities.

■ *Do you see society changing to accept women in leadership roles, especially among young people?*
Kanto: Yes, to some extent. There are many initiatives in Madagascar that support young women entering fields like politics, NGOs, and business. While it's still a work in progress, we can already see a shift towards more acceptance of women in leadership roles.

> ***"While it's still a work in progress, we can already see a shift towards more acceptance of women in leadership roles."***

**The original interview has been conducted in French. This is a translation.*

→ Driving the professionalisation of ASM*

I am **Mirana Rakotobe**, a mining engineer and the Director of the Professionalisation of Artisanal Mining at the Ministry of Mines in Madagascar. With over ten years of experience, I have worked extensively in the mining sector, including on the exportation of precious and semi-precious stones. I am also a member of AWIM Madagascar. My role involves supporting the formalisation and professionalisation of artisanal mining, providing technical and administrative support to informal miners, and ensuring the sustainable development of the sector in Madagascar.

■ *What is the government's approach to supporting ASM?*
Mirana: We recently adopted a new mining code, establishing a dedicated department for artisanal mining, which I lead. Our focus is on organising the informal sector, offering technical and administrative support to miners, and assisting them with the paperwork to form mining groups. This structure makes it easier to manage activities effectively. We collaborate with regional offices for documentation and field visits, while our central office reviews and approves the necessary permits.

■ *What is the government's position on formalising the sector?*
The government aims to formalise the entire sector through a gradual approach. We are starting by creating mining groups, each granted six-month mining permits for artisanal exploitation. After this period, we will assess the groups' capabilities in managing mining activities. If successful, we will issue them full mining licenses, renewable for up to eight years.

■ *What are your personal hopes for the future of ASM?*
The current situation is challenging due to limited resources. The Ministry receives less than one percent of the island's budget, despite providing the majority of the resources. We also face a shortage of personnel and equipment, with no vehicles available for field visits. Financial resources, particularly for health and safety, are scarce. Miners often lack protective measures, with their primary concern being survival. My hope is for increased support, better resources, and a stronger focus on the well-being of the workforce.

■ *What do you see as solutions to the challenges facing ASM, particularly in terms of formalisation and progress?*
The solution is complex, but it starts with securing financial resources and building capacity on-site, particularly in areas like human rights, health, hygiene, and safety. These areas need significant improvement. We must also enhance the skills of our staff, as expertise is lacking in some areas. While formalisation has been slow, we are moving towards professionalisation, which will take time. Improving productivity, addressing child labour, and tackling health issues like tuberculosis are key steps. Ultimately, securing funding and building capacity are critical to advancing the sector.

> ***"The solution is complex, but it starts with securing financial resources and building capacity on-site, particularly in areas like human rights, health, hygiene, and safety. "***

**The original interview has been conducted in French. This is a translation.*

→ Tackling challenges together*

I am **Micka Datch**, a 24-year-old student at the Higher Polytechnic School in Antananarivo, currently pursuing my Master's in Environmental Engineering. I've always been passionate about the mining sector, which is deeply ingrained in Madagascar's economic fabric. Growing up, I was inspired by my mother and uncle, who worked in the sector despite not having the opportunity to pursue higher education. Their support motivated me to pursue my studies and explore the potential of Madagascar's rich natural resources.

■ *Despite the many challenges in the sector, what keeps you motivated to continue working in this field?*
Micka: It's simple. Let's be honest: the mining sector offers great financial opportunities, and that's why I'm driven to keep going.

■ *How do you think this workshop can benefit you?*
Micka: It's mainly about the knowledge. This workshop has provided me with a lot of information I didn't know before.

■ *What is your motivation for working in this sector, and how do you see this training helping overcome challenges by collaborating with other small-scale miners?*
Micka: Yes, absolutely. Over the three days of this workshop, I've realised that we share common issues in the sector. Solving these issues together could also help resolve the broader problems.

■ *What are your plans for the future?*
Micka: My first goal is to obtain my degree in environmental engineering. After that, I would love to go abroad to further my studies and bring back my knowledge to really open up the world. So that I can truly thrive in this sector. I also want to build connections outside of Madagascar. I have a big vision – one day, I want to run my own company. My ultimate goal is to be the CEO and reach the top.

> ***"Over the three days of this workshop, I've realised that we share common issues in the sector. Solving these issues together could also help resolve the broader problems."***

**The original interview has been conducted in French. This is a translation.*

Artisanal and small-scale mining as an entrepreneurial sector

Deep-dive

The ASM sector in Madagascar and elsewhere is often comprised of people, groups and enterprises that are more nuanced and complex, more professionalised and highly entrepreneurial focused individuals than the ASM stereotype. Researchers have pointed out that the sector tends to be broadly painted as consisting of two types of workers, the "poverty driven" or the "get-rich-quick" individuals (Traoré et al. 2024). While there are certainly individuals in the sector that experience the harsh realities of which these typecasts are based, there are also many in the sector who are challenging this viewpoint. In contrast, some in Madagascar are savvy in mining as a business and know how to find long-term success within the context of the country. While often their beginnings were humble and likely also necessity based, their activities have allowed them to build something greater. While these enterprises are small and their earnings modest in comparison to the global scale, these mining entrepreneurs in Madagascar are indeed well aware of the challenges the sector faces in the country and often pay forward their good fortunes. ASM who have experienced such levels of success are often the first to pass on their knowledge of the laws and regulations governing the sector, of geology and mineral identification, and good mining business practices to younger generations looking to join the field. They establish mining cooperatives and federations to improve the sector. They become mentors and local leaders to some struggling in ASM. Building this conceptualisation and framework of entrepreneurial ASM can help rewrite the narrative to include these nuances (Traoré et al. 2024) and bring about real change for the sector. Governments, policy makers and others of influence in Madagascar should consider making real investments into supporting these businesses and initiatives if they are serious about the country's mining future.

→ Vision for growth, education and inclusivity

My name is **Santatriniaina Randriamananjara (Santa)**, and I have a background in geology and mining. I have been in the sector since 2005, initially working for a company before starting my own business in 2018. I also serve as country manager and technical head for a company involved in gold, graphite, lithium, and uranium. Since 2022, with the rising demand for lithium, I've been supplying local companies, mainly to Chinese and Malagasy buyers. Due to regulatory changes, I'm currently transitioning my small-scale mining license into a full-scale one, partnering to further explore and develop the resource.

■ *How were you able to build up your own business, and what do you consider your key success factors?*
Santa: Since 2005, I have built a network through various roles, starting with small jobs like mapping assistant. Over time, I met many geologists who, after working in Madagascar, decided to invest in promising projects. This led to collaborations like the lithium project, where we partnered with a geologist's friend, and a license in the north for heavy mineral sands. While I may hold only about a 20% share in some projects, I take on a leadership role in them.

■ *How can cooperation between ASM, companies or associations help overcome challenges?*
Santa: We worked with European partners until 2010 and became accustomed to their structured approach. This workshop brings us back to that more organised way of doing things. While some are only focused on business, we aim to build something more substantial. We want to create a database to enter larger contracts. The challenge is ensuring we can meet tonnage requirements, which requires investment, such as through initiatives like AfricaMaVal.

■ *Do you see your future in large-scale operations or focusing on medium-sized, high-quality operations?*
Santa: Regarding lithium, I don't see it growing very large for now. I envision it as a manageable, medium-sized enterprise, mainly because I'm not fully sure about the size of the deposit yet. I aim to operate at a standard level with good-quality material. However, for heavy mineral sands and graphite, especially with the company I represent, we're looking to collaborate with major players, as these deposits are massive.

■ *Do you see a role for hiring local Malagasy workers to help grow your business?*
Santa: Yes, hiring local people is essential and required by our mining code, which mandates hiring as many locals as possible. However, due to skill gaps, progress can be slow, and sometimes we need to bring in workers from the city. Although local workers may not always be happy about it, if they can't meet the job requirements, and we can't afford full training, we have no choice. I often seek advice from experts, as we have materials but lack the knowledge to identify them. For example, I once overlooked valuable materials like Amblygonite, which an expert pointed out to me. This shows the importance of knowledge exchange.

■ *How does education play a role in your work, and how can local training help address challenges like child labour?*
Santa: Education is a key factor for success. Thanks to my geology studies, I gained knowledge that allowed me to identify minerals my uncle wasn't aware of. This made a significant difference in growing our business. Training local people is also more manageable than many think. For example, if someone finishes a bottle of water, they might instinctively throw it away. But once you explain why that's harmful, they won't do it again. The same applies in mining; knowledge makes all the difference. If I sell a product, it might later undergo due diligence. If buyers find out that child labour was involved, they could reject it. I understand this issue, but our government lacks the resources to regulate and enforce laws effectively. As a result, issues like child labour persist, and vulnerable groups, like children and elderly women, are still working in mines.

■ *How do you see the role of women in your operations?*
Santa: I definitely see a role for women. Many of the technical experts here are women, and they bring a unique approach to the work. In some cases, I even find them more capable than men—I'm not ashamed to say that. In our company, we have women working alongside me, including on-site, where they take on tough tasks and oversee operations. They are just as capable as anyone else in these roles.

→ Lessons from a leader

My name is **Haja Ralambomanana**, and I lead the Federation of Mining Operators (Féderation des Opérateurs Miniers Malagasy - FOMM) in Madagascar. My background spans economics, mineralogy, and cartography, but mining runs in my family—my grandfather and parents were miners, and I eventually found my way back to the sector. After working in various industries and countries (India, China), I started my own coltan export business in 2012. In 2019, facing government policy changes, we established the Federation, now representing around 300 entities. We've supported the finalisation of the mining code, securing co-financing for ASM, and partnering on initiatives like child labour prevention in mica mining and tuberculosis prevention in mines.

■ *How big is your company, and what are its main activities?*
Haja: I currently employ around 30 people. My primary focus is on coltan, though I am in the process of launching another venture. Additionally, I run an entity dedicated to geological surveys. Alongside my business activities, I also share my knowledge with students at the Polytechnic University through lectures and offering them internships. Over the years, I've conducted numerous studies on reserves of chrome, graphite, and other minerals, which has allowed me to build a broad and deep understanding of the sector. Having worked in both mining and export, I've encountered a wide range of experiences. As the leader of the Federation, many people come to me with similar challenges, and I am often called upon to find practical solutions.

■ *Does your company operate in small-scale or large-scale mining, and what type of license do you hold?*
Haja: I hold both small-scale and large-scale mining licenses. In Madagascar, gold mining is not viable under a small-scale license due to the high costs and minimal output. The main issue lies in Malagasy law. In countries like Mali and Zimbabwe, companies are allowed to use cyanide, which, while dangerous, can be safely managed when handled properly. Madagascar is believed to have abundant gold, but the challenge is how to locate and extract it efficiently. The gold here is very fine, and with artisanal mining, only about 26% of it is recovered. However, with the proper methods, such as cyanide leaching, we could recover over 76%, but right now, we are essentially wasting gold.

■ *What advice would you give to young people who want to start a mining business in Madagascar?*
Haja: 1. Know the geology and your industry.
First and foremost, it's essential to have geological knowledge and a clear understanding of what you want to do. Many people see successful business leaders and assume they can just enter the industry without expertise. That's a big mistake. You need to understand geology and the fundamentals of the sector.

2. Understand the geopolitical and economic landscape.
You must stay informed about geopolitics, the political system, and current events. This knowledge will help you navigate challenges and make strategic decisions.

3. Master national policies and regulations.
Even if you disagree with some policies in your country, you need to understand and comply with them. Knowing the legal and regulatory framework is crucial for long-term success.

■ *Do you see cooperatives as a way for ASM miners in Madagascar to gain more influence and address challenges collectively?*
Haja: Yes, absolutely. That's why we have the Federation of Mining Operators (FOMM). In the past, there were several smaller associations, but the federation is now focused on providing solutions. While smaller associations still exist, leadership remains a challenge. In Madagascar, everyone wants to be in charge. Personally, I never aimed to be in a leadership role, but the situation placed me there. It's not about me, it's about the policies and the system. If you want to be heard and make a difference, you need to engage with the system.

"Many people see successful business leaders and assume they can just enter the industry without expertise. That's a big mistake. You need to understand geology and the fundamentals of the sector."

→ Women's leadership and a vision for value-added manufacturing

Solo Marcellin Ranaivoarisoa and his wife **Hasinoro Rahantamalampiarivo** lead mica export businesses based in Fort Dauphine and Tulear, Madagascar. Solo is the director of the company founded in 2011, and Hasinoro manages their second company established in 2021. Despite the traditional challenges for women in leadership, Hasinoro has been accepted in her position and continues to lead successfully. They maintain close ties with the local community, where artisanal miners play a key role in their operations. They believe in working collaboratively with the community, ensuring mutual support for better quality production.

■ *How was it accepted by other leaders who are mostly men?*
Hasinoro: It never really was an issue. I was always accepted as a female leader, despite the traditional patriarchy in Madagascar.
Solo: Everybody has a talent. Hasinoro is a strong leader– she has led the company for many years now. It's amazing to see. Now, she has also started a new company.

■ *How have you seen the sector change over time? How has your business evolved?*
Solo: The company has grown steadily since the beginning, though we've faced significant challenges along the way. Since 2021, we have had to comply with international due diligence requirements, and we started assessing them this year.

■ *How do you see collaboration with the ASM sector evolving? Do you currently work with other artisanal miners, and how do you envision strengthening these relationships moving forward?*

"Although we have our own mining license, we rely on working with the local community. They carry out the mining, and we purchase the product through negotiation based on market prices."

Solo: Although we have our own mining license, we rely on working with the local community. They carry out the mining, and we purchase the product through negotiation based on market prices. We also provide support to help improve both production and quality.

■ *Is working with the community an important aspect of your operations?*
Solo: Yes, it's essential. This is the only way we operate. We haven't considered mechanisation yet because manpower is available, production meets demand, and costs remain manageable.

■ *What do you do to fight child labor? Do you have a specific initiative?*
Hasinoro: In 2021, a documentary exposed child labor in Madagascar's mica sector. As a result, some end users required stronger measures to address the issue. Clients sent auditors, and we received specific requirements to meet. Based on these, we are taking action.

■ *What is your aspiration for your businesses? What do you want to achieve in the future?*
Hasinoro: We currently export raw materials to China for processing, but our dream is to add value in Madagascar by setting up a local factory. This would allow us to process and manufacture products domestically before selling them internationally. However, achieving this goal requires both technical expertise and financial resources. Our oldest company is 30 years old – let's see how long it takes to build a factory.

"We currently export raw materials to China for processing, but our dream is to add value in Madagascar by setting up a local factory. This would allow us to process and manufacture products domestically before selling them internationally."

Key Messages by the Actors in the ASM Sector in Madagascar

→ ASM sector is ripe for federal investment

It is known that ASM is the second largest type of employment of people in Madagascar. While the complexities of the country's economic situation should not be underappreciated, even small investments in the ASM sector can go a long way towards improvements in livelihoods of millions of Malagasy. With the government's push for advancing the mining sector in the current rush for CRMs and the country's the diverse mineral wealth, any support of artisanal miners to transition to formalised, responsible small-scale miners can have ripple effect of increasing communities and regional prosperity. In addition, the government can advance the sector by re-examining the depth restrictions of the PREA permit, such that the earning potential of the sector is not limited. Further, AfricaMaVal recently summarised action points, such as establishing formal ASM mining zones, exploring legal and technical means for ASM exploitation of deeper ore deposits, improving geological and economic data availability of ASM production in the country, supporting and incentivising artisanal mine site operators to improve their ESG standards and providing capacity building, as just some of the ways the government can support and invest in the sector (Schuette et al. 2025).

→ Women as essential actors in the ASM sector

Highly educated women are driving change for the ASM sector with some choosing to return to Madagascar from abroad after receiving advanced education in the geological sciences and mining. Some are quietly revolutionising leadership roles, whether that be in the family business or in governmental positions. Many arrive at the workforce committed to changing the mining sector for the better and make it more inclusive for women. Their goal is simple, advance gender equality in mining across the country, and it will in turn fuel local and regional economic growth. By establishing an inclusive support system for women in mining, they are bringing education and additional skills to those struggling in ASM. This facilitates positive shifts in the narrative by raising awareness on a broad range of topics and the laws and regulations governing the sector. Women in mining in Madagascar are smashing stereotypes that have them limited to lesser roles, proving that indeed women can command leadership roles in mining and other sectors. Additional investments in women in the extractives industry in Madagascar will not only lead to a more equitable sector but transform disadvantaged communities into thriving industrial engines that positively contribute to Madagascar's economy and future.

→ Education as key to empowering the youth

The youth are the future of Madagascar and education will be key to their success. They know very well that to thrive in ASM in Madagascar is challenging and continuing education and building knowledge and skills is key to maximising opportunities in mining and they are motivated and hungry for a chance. Furthermore, they recognise that the vast challenges of the sector are best solved collectively. Supporting initiatives and providing multisectoral capacity building on a range of topics, from using simple mineral identification tools, geology, mining as a business, and value addition can go a long way in propping up the youth. An educated young workforce would ensure a more prosperous future for the ASM communities and help secure the country's economy.

→ Entrepreneurial leaders driving ASM development

There exist now leaders working in ASM in Madagascar whose knowledge and leadership within the community could be leveraged to improve the livelihoods of other Malagasy in the sector. These individuals are models of success, whose knowledge is a resource, as they know the ins and outs of the sector and have found a way to still be modestly profitable within the limited infrastructure and support available in the country. Furthermore, they often already have the respect of the community as many come from humble roots themselves. Supporting local leaders, supporting their practices of hiring locally, and providing their employees with safe working conditions and capacity building and skills development will make a significant difference for those working in the sector in Madagascar.

About …

Africa MaVal: Due to the high level of natural concentration in particular regions of the globe, deposits of raw materials in the EU not easily accessible, already depleted after years of exploitation or not exploitable for technical or economic reasons, Europe is naturally highly dependent on foreign imports for minerals. But in this context, geopolitical issues could heavily affect Europe's supply, lead to price volatility, and impact market changes. As future demand of primary critical raw materials (CRM) will continue to be largely met by importations, EU needs to diversify its supply chain and engage strategic partnerships with resources-rich third countries covering extraction, processing and refining. The African continent is an ideal partner for the EU to achieve these goals given its proximity and its exceptional endowment in these much sought after ECRM.

In this context, the EU funded AfricaMaVal project was introduced in 2022 with the primary objective to develop an EU-Africa partnership ensuring a responsible sourcing of mineral resources for the European industry while granting a sustainable local co-development in the best Environmental, Social and Governance (ESG) conditions for Africa, leading to a long-terms business environment for European and African companies. While the development of the African mining sector will expand the availability of CRM for EU supply chains, the increased investment and financing can allow the EU to exert leverage on raw material supply chain conditions in order to improve their sustainability profile.

To build such partnership in a sustainable manner, the AfricaMaVal project is implemented through the following key steps:

- Create a Pan-African dataset of critical raw materials supply potential,
- Analyse the CRM value chains in Africa, focusing on both primary and secondary raw materials
- Identify financial instruments,
- Analyse ESG conditions in various African countries,
- Build an EU-Africa business network,
- Develop a strategy for the integration of EU and African raw materials value chains,
- Identify responsible sourcing opportunities.

Due to the high relevance of the Artisanal and Small-Scale Mining sector (ASM) for livelihoods and local development in Africa, specific attention is being placed on integrating this sector along the different project's steps. More specifically, the project organises capacity building programmes for the ASM sector to foster best practices for CRM extraction. These interviews presented here were conducted in the frame of the AfricaMaVal ASM capacity building in Madagascar, with the idea to spread awareness of the complex and nuanced realities of the sector.

Overall, the project's main tangible result will be a list of 100 evaluated opportunities of responsible investments in the CRM value chains in Africa. It is expected that between 30 and 50% of these opportunities could be converted into concrete projects of EU-African partnerships. This would lead to a significant increase of European mining projects in Africa and thus would contribute to securing EU sustainable access to primary and secondary raw materials from Africa.

The project is coordinated by the French Geological Survey (BRGM) and implemented together with 17 other European and African partners including DMT GmbH, DMT South Africa, HCF International Advisor, EIT Raw Materials, Bundesanstalt für Geowissenschaften und Rohstoffe (BGR), Association of Women in Mining in Africa (AWIMA), LGI Sustainable Development, INTRAW, South African Chamber of Commerce and Industry NPC, Minerals Africa Development Institute (MADI), National Laboratory of Energy and Geology (LNEG), Sant'Anna School of Advanced Studies, Namibia University of Science and Technology, Geological Survey of Europe (EGS), Levin Sources and World Resources Forum Association.

ASSOCIATION OF WOMEN IN MINING MADAGASCAR

AWIM Madagascar promotes the empowerment, leadership, and meaningful participation of women across Madagascar's mining sector. The association supports women miners through capacity building, advocacy, and networking opportunities, working to enhance their visibility and influence within artisanal and small-scale mining (ASM) and beyond. By fostering inclusive governance and access to resources, AWIM Madagascar helps strengthen women's roles not only as workers, but as decision-makers and entrepreneurs in mining value chains. The association is a national chapter of the Association of Women in Mining in Africa (AWIMA), a pan-African network launched in 2015 under the African Union Commission to unite women's mining associations from across the continent. AWIM Madagascar plays an active role in advancing gender equity in mining through community engagement, policy dialogue, and collaboration with local and international partners.

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