



The mica value chain in Madagascar

A model for sustainability analysis

June 2024

REPORT



BASIC



About RMI

The Responsible Mica Initiative (RMI) is a global Coalition for Action – putting policy into practice – comprised of multiple organizations committed to establishing fair, responsible and sustainable mica supply chains globally, that will eliminate unacceptable working conditions and eradicate child labour.

RMI uses a multi-stakeholder and holistic approach that engages companies, civil society organisations, industry associations and governments to develop and implement three integrated program pillars that will establish responsible workplace standards, empower local communities, and establish a legal framework for the mica sector.

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BASIC conducts social and economic analysis on value chains, on their governance and sustainability, with the objective of fuelling the public debate and supporting the social and environmental transition of actors and territories. The studies published by BASIC are designed to inform the public, through partnerships with civil society organisations and by helping decision-making processes of public and private actors. Since its establishment in 2013, BASIC has published studies on the value chains of banana, pineapple, cocoa, wine, grapes, coffee, milk, meat, and cereals, applying a unique methodology to estimate prices, costs, taxes, and margins along the value chain and enabling scenario-based modelling.

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1. Background

This study, which focuses on mica mining in Madagascar, is a companion piece to the report “BASIC Economic Report – India” commissioned for RMI’s March 2023 study “Establishing Fair Mica Worker Incomes and Wages in India and the Negligible Impact on Costs to Consumers.”¹ Like the India study, the present research report and quantitative online model examine the mica value chain in its current situation and in a hypothetical scenario of greater respect for existing regulation, with living wages for all stakeholders in-country, and a village grouping of mica pickers. Also like the India study, this study concludes that paying a living wage to mica scrap pickers entails only an infinitesimal increase in the price of finished products. The value chain from India and Madagascar, including costs, margins, and taxes, can be explored at this link: <https://micavaluechain.lebasic.com/>.

2. Introduction

Madagascar is the world’s third-largest purveyor of mica, just behind India and China. This resource is extracted in artisanal mines. In general, mica miners and pickers in these mines work in poor conditions, and they are captive to traders downstream. The vast majority of them do not make a living income. Rather, miners often live in poverty, in areas remote to government services like schools and healthcare centres.

Ever since a drought hit several years ago, creating a famine (“kere”), formerly agricultural households have switched to mining and picking mica to make a living. Children are brought into the mines to work, because there is no schooling available and because it is the only way to make ends meet. It is estimated that half of Madagascar’s 20,000 mica pickers are children.²

The mica mining sector in Madagascar is well-regulated from a statutory standpoint, but regulations are not always respected. For instance, mica miners/pickers are not formally organised into any kind of formal organisation, although this option is available to them under the law. Administrative documents necessary for transport of mica are sometimes forged. In addition, despite the existence of a formal redistributive tax to local authorities, informal commissions to local officials or the police are commonly reported during mica transport.

To address this situation, efforts are currently underway to uphold the mining code more stringently and to address the problem of kickbacks along the chain. This possible future, its configuration, and its costs, are the subject of this study. Specifically, we built a quantitative model of the mica value chain in the current situation, and a second model of a scenario where mica miners/pickers organise into village-level “Mining groups” as per the mining code. In this possible future, mica pickers are paid a living wage, as are all other workers along the chain. The impact on downstream products in the mica value chain, such as paint, vehicle droning insulation, and electric vehicle batteries, is also modelled.

The results of the “Mining groups” scenario are somewhat like those of the India “Cooperatives” scenario. In both cases, mica pickers earn a living wage – increasing the mine-gate price of mica six-fold, in the case of Madagascar. Living wage enforcement increases costs to collectors, but also to exporters. The FOB price of mica rises consequently, as does the price of intermediate products. However, the price of mica at the mine is so low to begin with that the ultimate price impact on the finished product is less

¹ The Appendix is titled “The mica chain from India to the world: A model for sustainability analysis” and begins page 59. https://responsible-mica-initiative.com/wp-content/uploads/2023/04/20230314_Mica-income-wage-and-cost-analysis_RMI-Overview.pdf

² RMI, « Eléments de compréhension du contexte : Madagascar 2023 », 2023

than 1 USD, and with one exception, less than 0.1% of this final price (and with one additional exception, less than 0.01%).³

3. Industry overview

3.1. Size of the mica industry

In 2021, Madagascar produced 56,100 tonnes of mica worth 11,435,549 USD.⁴ This makes it number three in annual production, just behind China and India. Mica mined in Madagascar is usually phlogopite mica found in large, solid blocks; it is the preferred type of mica for electrical applications. It is to be noted that Madagascar’s production of mica has boomed in the last ten years.

About 60% of Madagascar’s mica in volumes is exported as sheet mica, while about 40% – what remains after books are dressed into sheet mica – is exported as scrap. The distribution of value of these exports in USD is approximately the same as it is in kg.⁵ However, according to UN Comtrade, the per-kg price of mica has significantly decreased in the past decade (Figure 3).

For the purpose of this study, we focus on mica scrap, as this is the type of mica that is used to manufacture our downstream products – DIY paints, droning insulation, and electric vehicle batteries. Unlike India, Madagascar exports virtually no transformed mica (such as mica powder); rather, mica is ground into powder farther down the chain, mainly in China.⁶

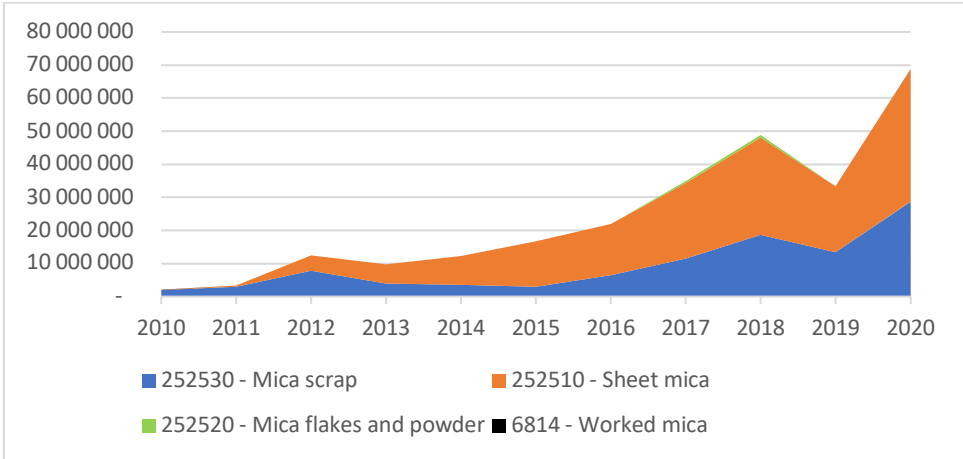


Figure 1. Madagascar exports of sheet mica, scrap mica, mica flakes/powder and worked articles of mica in kg. Source: BASIC 2023 based on UN Comtrade

³ The sole exception is DIY anti-corrosion paint, whose price increases by 3 US cents (an increase of 1.2%).

⁴ Source: UN Comtrade

⁵ This is a puzzling feature of the UN Comtrade data; exporters from Madagascar report that books of “gaze” (sheet) mica sell for more than mica scrap, but at least as divided in the HS codes in the Comtrade data, the two codes sell for approximately the same price.

⁶ See Figure 5 below.

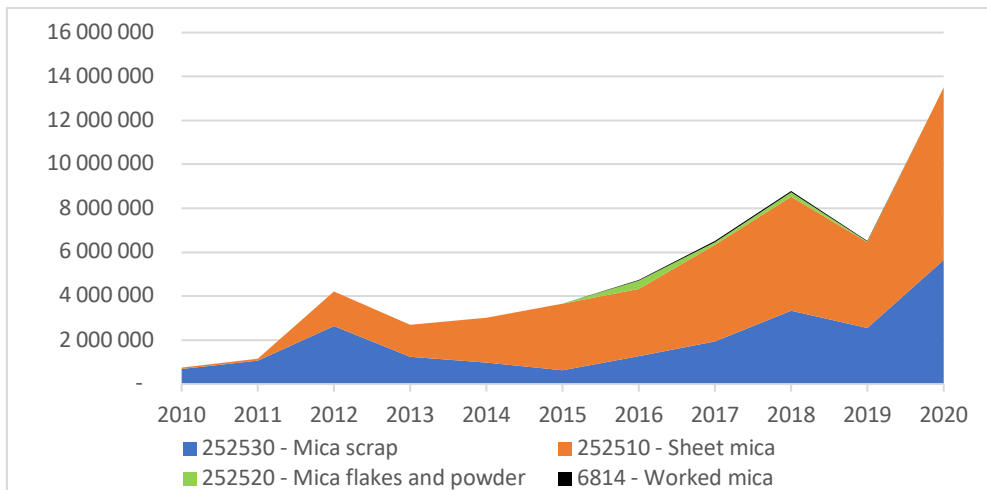


Figure 2. Madagascar exports of sheet mica, scrap mica, mica flakes/powder and worked articles of mica, USD value.
Source: BASIC 2023 based on UN Comtrade

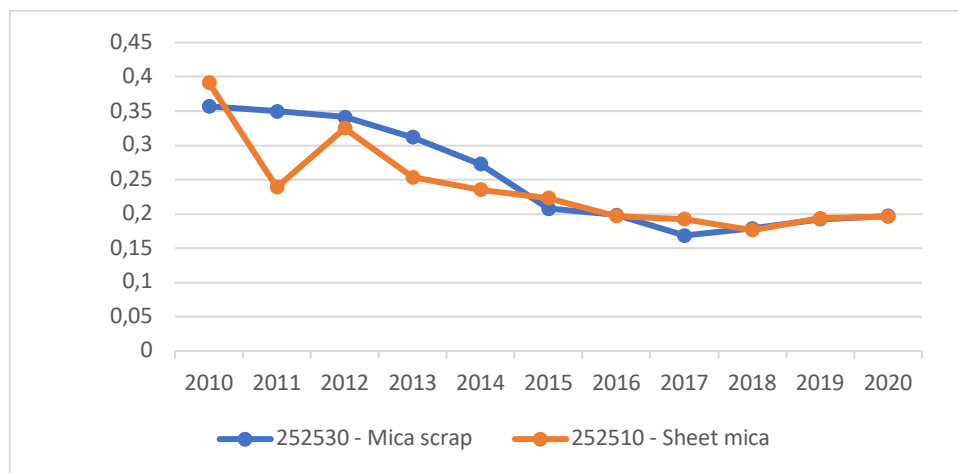


Figure 3. Per-kg price of sheet mica and scrap mica from Madagascar, 2010-2020, in USD.
Source: BASIC 2023 based on UN Comtrade

3.2. Mining and societal conditions in Madagascar

Mica mining in Madagascar is artisanal. It is conducted shafts like in India, but the difference is that most of these shafts are new; although there are some piles of antiquated mica scrap to sort through, the focus of mica pickers is on debris from current mining operations. Book mica is brought up to the surface where it is sorted, cleaved if necessary, and immediately sold. Men keep the higher-value mica while women and children keep the waste, they then sell it on to a “peseur” (weigher) who works for a collector, who may be independent or be directly employed by an export business.

Mica picking is often a family affair. For instance, a single mining site might be divided between members of an extended family, from grandparents all the way to children.⁷ Individual nuclear families work together at a single digging/excavation spot; if a man has several wives, then each of them is assigned

⁷ International Labour Organisation (ILO) and Madagascar Ministry of Mines and Strategic Resources, “Rapport provisoire: Recensement des exploitants du mica,” 22 June 2021.

her own pit for her and her children to work in.⁸ In most cases, adolescent and adult males conduct the mica mining, while women and children at the surface do the sorting, making piles of mica of different thicknesses and size.

Mica pickers in Madagascar are price takers and often live in poverty. In Madagascar, exact figures for what mica pickers currently earn are difficult to obtain, but field research suggests that miners make an income that is around the level of the extreme poverty line, far from a living wage.⁹ Madagascar mica has a reputation for being cheaper than Indian mica, and at the mica picker level, and this is confirmed by the price paid to pickers for low-quality scrap: in India, around 0.099 USD/kg, versus 0.024 USD/kg¹⁰ reported for Madagascar.¹¹

Poverty is a reality in mining communities in Madagascar. In Madagascar as a whole, poverty levels are high – in 2019, three-quarters of the population lived on less than 1.90 USD per day (the international extreme poverty line at the time), and mining incomes hover around this indicator.¹² Multidimensional poverty is high: in Madagascar, the Human Development Indices of the provinces where mica picking mostly takes place are below the national average, which is itself quite low.¹³ Compared to other regions in Madagascar, in mica-picking regions rates of both child labour and child marriage are high, educational attainment is low, and access to potable water and sanitation is extremely low. The last several years have seen extreme food insecurity in southern Madagascar due to drought; the UN World Food Programme has called the situation the “first famine linked to climate change.”¹⁴ Fertility is also high – as many as 8 in Androy and 6 in Anosy provinces, two of the most productive mica provinces – meaning there are many mouths to feed.¹⁵

Testimonies from mica workers are telling: most mining families do not make enough money to eat three meals a day; manioc, cactus fruits and June plum are daily staples, and occasionally, rice. If there is not enough money at the right time of day, families may “eat” boiled water for lunch or dinner (especially adults who sacrifice themselves for their children).

Basic public services like schools, water, and health centres (CBS) are remote to most mining families.¹⁶ The absence of schools is especially problematic as it gives parents no alternative but to bring their children with them to the mines. In Madagascar the estimate is that half of all mica workers are children, i.e. 10,000 children out of a total of 20,000 miners/pickers, plus an additional 1,000 children out of 2,000 sorters.¹⁷

There are various factors contributing to child labour. The *de facto* family ownership of mines may be an additional factor aggravating the resort to child labour. There is also a cultural component: parents

⁸ ILO et al. 2021, op. cit.

⁹ SOMO and Terre des Hommes, “Child labour in Madagascar’s mica sector,” November 2019

¹⁰ To keep our findings consistent with the date of data collection, we use the exchange rate from September 2022, namely 4,142 MGA to 1 USD. As of November 2023 the rate is 4,544 MGA to 1 USD.

¹¹ ILO et al., 2021, op. cit. and field research for BASIC by the Responsible Mica Initiative (RMI).

¹² SOMO et al. 2019, op. cit.

¹³ SOMO et al. 2019, op. cit.

¹⁴ France Info, « Le "Kere", famine endémique du sud de Madagascar », 21 Septembre 2021

¹⁵ SOMO et al. 2019, op. cit. Polygamy is also practiced in the Bekily region, where men may have 2 to 7 wives. ILO et al., 2021, op. cit.

¹⁶ ILO et al., 2021, op. cit.

¹⁷ SOMO et al. 2019, op. cit.

tend to have many children with the idea that the children will care for them later in life, but in the famine context it is expected that everyone pitches in right away.

People living in rural southern Madagascar have been especially hard-hit by a famine for the last few years (the “kere”), caused by an unusually long drought whose intensity was exacerbated by climate change. Many of today’s mica miners used to work in agriculture, but they resorted to mica mining when drought killed off their flocks and dried up their land. In Madagascar, locals report that they used to live off agriculture, but climate change (drought conditions) has made traditional agriculture a risky business and mica is now a better way to earn a living, however paltry.¹⁸

Mica miners often work not only in difficult conditions (under the hot sun, faraway from water sources, etc.), but they also work long hours and into the night. This happens at times in villages where a trader wants to load his truck at night in order to avoid paying taxes levied by the Commune, by leaving the geographical area of the Commune outside daytime working hours.¹⁹ In Madagascar, there were also reports of deaths and injuries in mining accidents and landslides.²⁰ Mica handlers in Madagascar suffer from many of the same problems as artisanal miners in India: silicosis, asthma and bronchitis; headaches from breathing in mica dust; repetitive stress injuries and musculoskeletal disorders; eye injury and irritation; and injuries, abrasions, and abscesses, especially on the hands.²¹

In terms of output, research suggests that mica scrap pickers in Madagascar process more mica per day than their Indian counterparts – up to 40 kg per person per day, as against less than 20 kg in India. The explanation for this appears to be the fact that mica scrap in Madagascar comes from blocks brought up “fresh” from the mine – making it relatively easy to collect small pieces that have cleaved off – whereas in India the work is more tedious, as it mainly involves going through old piles of debris and identifying the shiny bits of mica within these piles.



Figure 4. Piles of valuable mica books picked “fresh” from the mine, with scrap mica of varying quality on the outside, in a mine in Madagascar. Source: RMI 2023²²

¹⁸ ILO et al., 2021, op. cit

¹⁹ ILO et al. 2021, op. cit., pp. 55, 59, 63, and 73.

²⁰ SOMO et al. 2019, op. cit. and ILO et al. 2021, p. 64.

²¹ Child In Need Institute, “Child Labour in Mica Mines of Jharkhand- A situation analysis report,” 2018; SOMO et al. 2019, op. cit.; ILO et al. 2021, op. cit., p. 90.

²² RMI 2023, op. cit.

3.3. Administrative and tax situation

The mica sector in Madagascar is thoroughly regulated by a variety of statutes and decrees. These regulations pertain, for instance, to the authorised types of activities in artisanal mines; the legal status of mine operators; applicable taxes; working conditions; and environmental protection.²³ Madagascar is also a signatory to numerous conventions that protect human rights, including those of workers, women, and children.

In theory, there are three types of mining permits: Research permits (Permis de recherche, PR), Exploitation permits (Permis d'exploitation, PE); and Permits reserved for small-scale miners (Permis réservé aux petits exploitants, PRE). The small informal mica mine operators are found in places where all three of these permits exist.²⁴ However, although they have a status in the law as well as rules that apply to them, not all mica operators or groups of operators are declared to the Commune, as should be the case under the law. Some simply exploit mines that have been abandoned by mining companies.²⁵ In addition, it should be noted that even if they wanted to formalise their status, miners might not be able to – according to sources, the government has ceased issuing mining permits since around the year 2012, although this looks set to change.²⁶ Some exporters possess mining licenses and have arrangements with the people working in that mine to collect mica exclusively for them.²⁷

To get through different tolls that lead from the exploitation areas to mica sorting sites or export sites, a truck driver must have possession of a Laissez-Passer (LP) as well as a “Product declaration” (Déclaration de produit). These are in short supply, so holders of legitimate documents photocopy them and sell them to other truckers.²⁸

A concept that is key to understanding the functioning of the mica supply chain in Madagascar is the important role played by “ristournes” (fees) paid to various entities. According to the law, exporters must pay a 2% tax on their mining exports (*redevance minière*), 1.4% of which is given back as “ristournes” to local government – the 1.4% is distributed between communes (60%), regions (39%) and provinces (1%). However, a result of transporters using photocopied documentation from provinces/communes other than those where the mica truly originated, the “ristourne” levied on mica sometimes goes to the wrong local administration, to the great frustration of local officials.²⁹

In addition to this official ristourne, truckers also report paying additional fees to stakeholders that they encounter along the road: officials from fokontany (villages), officials from communes, region officials awaiting at the region demarcation line, and also the police – with truckers passing 4 to 6 police roadblocks depending on the length of their journey.³⁰ Collectively, these kickbacks, which are confusingly also named “ristourne,” can amount to up to 8% of the FOB price of mica.³¹

²³ ILO et al. 2021, op. cit., pp. 7-12.

²⁴ ILO et al., 2021, op. cit., p. 17.

²⁵ ILO et al., 2021, op. cit.

²⁶ BASIC interview with Madagascar mica sector expert, 20 January 2023 and ILO et al. 2021, op. cit., p. 57.

²⁷ ILO et al., 2021, op. cit., p. 46, and RMI interviews with mica sector stakeholders, February 2023.

²⁸ BASIC and RMI Interviews with Madagascar mica sector experts, 2023.

²⁹ BASIC Interview with Madagascar mica sector experts, 2022-2023.

³⁰ ILO et al., 2021, op. cit., pp. 54-56.

³¹ BASIC interview with mica sector expert, 20 January 2023.

3.4. The mica value chain

Mica collected at the mine may undergo different levels of processing, depending on the location and on the expectations of weighers/collectors. In some cases, all mica extracted is directly bagged, while in others it may undergo a first preliminary sorting.³² The work consists of sorting mica into piles by size and thickness, and – in some locations – shaking the smaller pieces of mica through sieves to remove debris and classify it into the right size class. Sometimes the mica is also cleaved on-site. While men and boys are more likely to work inside the mine shaft extracting mica, mica sorting and cleaving is more often left to women and girls.³³ As noted above, higher-quality mica is usually left to men to sell, while women and children are given mica scrap.

After mica is collected at the mine, it is brought to weighers and collectors, who weigh the mica and pay miners/pickers accordingly. Mica miners and pickers are captive of the agents down the chain. They have little control over when weighers/collectors will visit their areas, and they sometimes walk long distances with their mica production in a bucket or bag to meet a collector passing nearby. It is also reported that weighers sometimes manipulate mica miners and pickers by using fraudulent scales or not factoring in the quality of the mica in the purchase price.³⁴ Mica workers are vulnerable to exploitation because many (if not the majority³⁵) are not literate or numerate.

Mica collectors often park their truck in one place several days in a row, allowing those living in neighbouring villages to bring in their mica over several days, and leaving only when the container is entirely filled. Dockers – the individuals who load and unload mica onto trucks – therefore sometimes receive a stipend for meals and housing in addition to their wage. As noted above, some of this work may take place at night, to avoid paying informal taxes to local officials. Currently, it appears that weighers and dockers do not make a living income, although heads of collection businesses do.

Once the mica reaches a major city where the exporter has his factory, an additional round of sorting takes place to prepare mica for export. Some sorting may take place at a regional capital, to avoid unnecessary transport of rejected material to the port. Numerous employees work in these sorting centres, including weighers, controllers, sorters, dockers, administrative assistants, and site managers – up to 250 employees for a large sorting centre handling 50 to 75 tonnes per day. Apart from site managers, it is estimated that these employees currently make less than a living wage.

Most of the mica scrap exported from Madagascar is destined for China (see Figure 5 below), where it is transformed into mica powder; mica paper, tape, and board; and micanite.

³² ILO et al. 2021, op. cit., p 18.

³³ ILO et al. 2021, op. cit., p. 26.

³⁴ ILO et al., 2021, op. cit., p. 57.

³⁵ By one estimation, 99% of mica miners and pickers are illiterate. RMI 2023, op. cit.

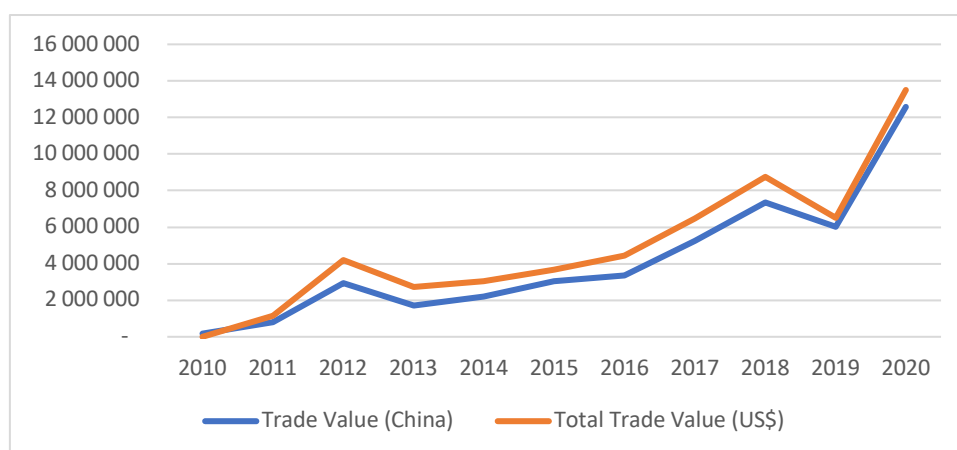


Figure 5. Share of China in mica exports from Madagascar, 2010 to 2020.
Source : BASIC 2023 based on UN COMTRADE

4. Results for Current situation and “Mining groups” Scenario

In this section, we present the baseline results and a scenario for change that are explored in the quantitative model of the mica value chain. First, there is the current situation. Second is a scenario called “Mining groups,” in which multiple families come together to form formal mining groups that would sell their mica collectively at the local level, and everyone in the value chain earns a living wage.

4.1. Current situation

In the current situation, the features of the mining/picking economy are those described above, with informality prevailing and relatively low prices for mica. Mica scrap sells for around 100 MGA/kg, i.e. 0.024 USD/kg. It is collected by dealers, who pay approximately 238 MGA/kg (0.057 USD/kg) for a variety of costs, including wages of collectors, logistics workers and weighers, as well as facilitation fees and fees for photocopied Laisser-Passers – see Figure 6. In turn, mica is handled by exporters who pay a mix of wages for their workers (weigher, controller, sorter, docker, site manager...), various operational fees (machines, energy, water, rent, communication), and a variety of taxes (including corporate income tax, export authorisations, laissez-passers, bills of lading,³⁶ and mining taxes) – see Figure 7. Once all these costs are considered, the export price of mica scrap is around 717 MGA/kg (0.18 USD/kg). This is coherent with reports from exporters who said mica scrap sells for between 671 and 864 MGA/kg FOB (0.16 to 0.21 USD/kg).³⁷

³⁶ Bills of lading are fundamentally documents issued by a carrier to acknowledge receipt of cargo for shipment. They are an indispensable document in the logistics and supply chain of international trade; they are used as receipts for goods, as a contract of carriage, and as a title document (establishing ownership of the goods). There are a variety of models for bills of lading, with some being negotiable and other not, or some establishing whether there are any irregularities or damage with the goods at time of loading or on arrival. The bill of lading typically includes information about the shipper and consignee; a detailed description of goods; ports of loading and discharge; name of the vessel; terms of the shipment (e.g. freight payable at destination or prepaid), date of issuance and signature of the carrier. Bills of lading are important as evidence of contract; to facilitate financing; to obtain customs clearance; and as a basis for dispute resolution.

³⁷ RMI interviews with Madagascar mica exporters, February 2023 and October 2023.

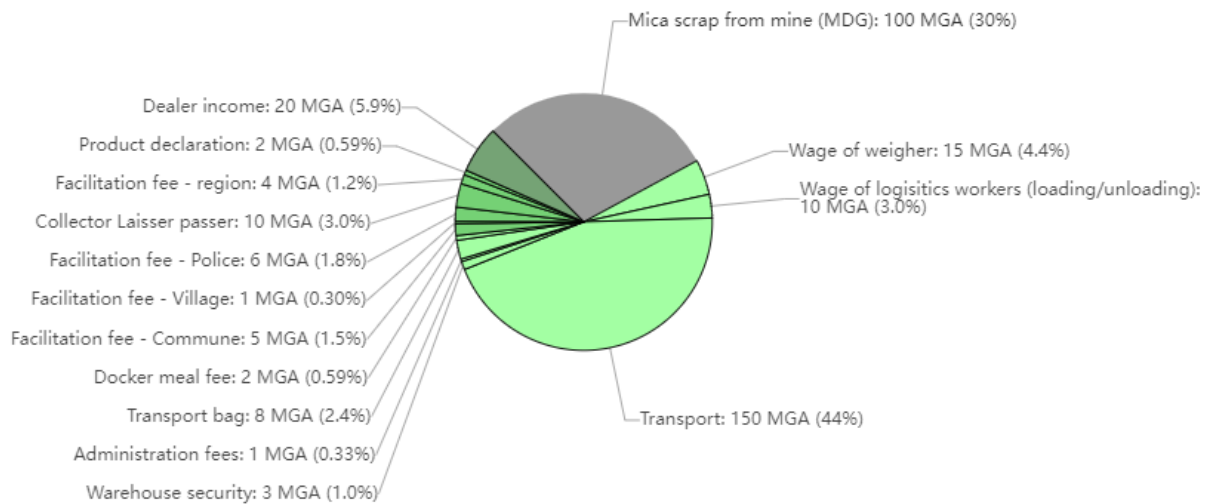


Figure 6. Breakdown of costs (per kg) for collectors of mica in Madagascar in the current situation. Source: BASIC 2023, based on bibliography and RMI

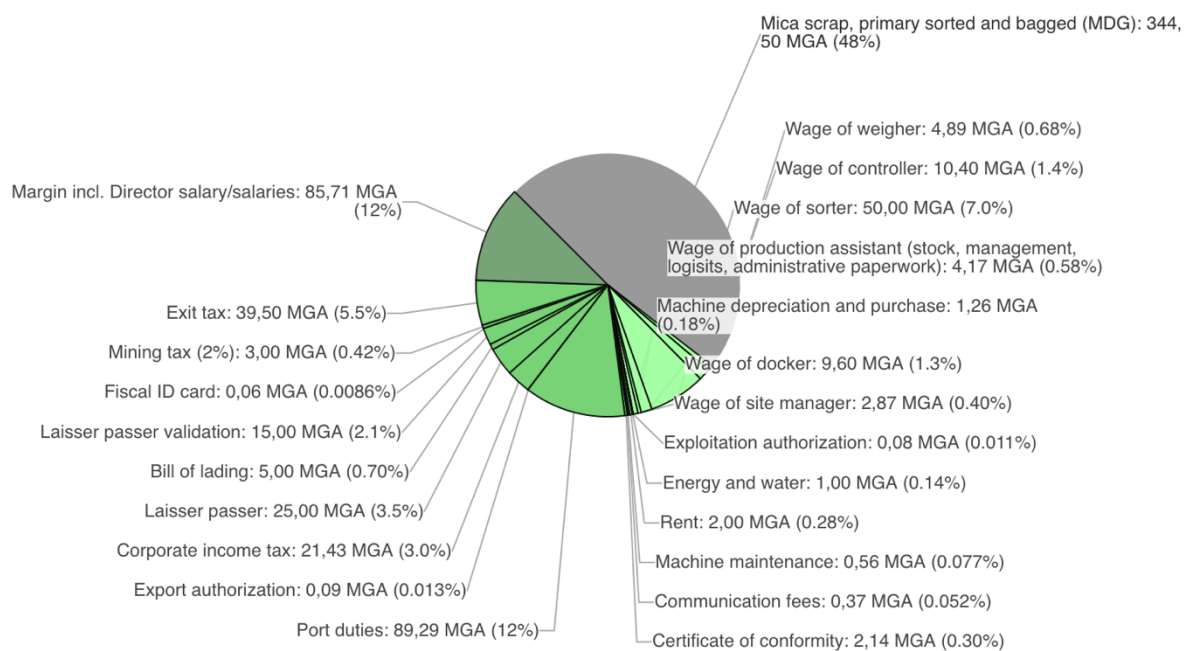


Figure 7. Breakdown of costs (per kg) for exporters of mica in Madagascar in the current situation. Source: BASIC 2023, based on bibliography and RMI

This baseline situation approximates to the best of its ability the current reality. Informal facilitation fees (to villages, communes, region, or the police) and cut corners (such as photocopying Laisser-Passers instead of acquiring them legally) are maintained in their current, reported state. Most importantly, no adjustments are made to formalise the sector or to offer workers a living income/living wage. This is the purview of the “Mining group” scenario, to which we presently turn.

4.2. “Mining groups” scenario

The “Mining groups” scenario explores what would happen if mica pickers and miners were to organise into small, village-level groupings that sold their mica on a collective scale. Mining groups would be constituted under Article 11 of the Mining Code, which specifies that:

“Artisan miners... can come together and form groups of small operators... The group thus formed constitutes voluntary associations of individuals working in the same municipality. Their purpose is to serve as a grouping framework for their respective members and to facilitate the formalisation and supervision of their mining activity.”³⁸

Regarding the prospects for creating mining groups, the ILO deems that the terrain for such an initiative is fertile in theory, because the current way of doing things is already collaborative. For instance, families are accustomed to working together on a single mine site and redistributing the value of the mica picked in a consensual manner.³⁹ Miners report that to the best extent possible, they handle conflict through traditional forms of mediation and communal harmony (“fivahanana”).⁴⁰ It may therefore be a small step from this kind of arrangement to a more formalised arrangement at every mine site. However, to temper the ILO’s optimism, it should be underlined that this tradition in and of itself is no guarantee that the arrangements made are fair or equitable, or that they will intrinsically respect the rights of women and children in particular.

The quantitative model of the “Mining group” scenario makes the following assumptions:

- Mica pickers as well as workers at every stage in the chain are paid a living income/living wage, estimated at 580,000 MGA per month in 2022 by the Anker Living Wage and Income Research Institute⁴¹. This wage is dispatched to a per-kg wage based on the quantity of mica that each class of worker handles in a single day.
- Unofficial facilitation fees (to villages, communes, region, or the police) are eliminated.
- Key administrative obligations that have been neglected to date are applied and respected. For instance, mining groups obtain a fiscal ID card and a “Framing zone” permit (*zone d’encadrement*), which is later converted to a proper PRE permit. However, because the cost of these administrative procedures over the long run is negligible, in the model their value is set to zero.

Further, the mining groups have two main costs:

- PPE: Mine workers and mica pickers receive Personal Protective Equipment, including hammer, chisel, crowbars, shovel, pickaxe, helmet, headlamp, rope, pulley, masks and gloves. This cost is approximately 50 EUR per year, per person and is assigned to the Mining group.
- Manager salary: In the scenario, mining group hires a part-time manager to coordinate the work of the mining group, to tend to relations with weighers and collectors, and to ensure administrative compliance and relations with local officials.

³⁸ ILO et al. 2021, op. cit., p. 116.

³⁹ ILO et al. 2021, op. cit.

⁴⁰ ILO et al. 2021, op. cit., p. 64.

⁴¹ This figure corresponds to the [Anker Living Income Reference Value for rural Madagascar, 2022](#)

Under this scenario, on the assumption that mica pickers sort approximately 40 kg of mica per day⁴² for a 25-day month, the buying price of mica scrap increases to 580 MGA/kg, that is, almost 6 times the current price. Costs at the next levels of the chain – collection and export – increase somewhat, as living wages entail a multiplication of current salaries by a factor of approximately 1.3 to 2.6, depending on the position. The rise in income for workers at the sorting-and-export stage is such that exporters are now obligated to pay tax on their workers’ salaries (IRSA), at the level of 15% of net margins.

As a result of these changes, the price of mica purchased from miners by the mining group stands at 580 MGA/kg, i.e. 0.13 USD/kg. A small increase in price (+25 MGA/kg) is observed at the (new) mining groups stage of the value chain; this reflects the cost of a salary for a part-time group manager, as well as the cost of the PPE. The price after primary collection by weighers/traders increases by 513 MGA relative to the current situation, reaching 851 MGA/kg. The FOB price of mica increases to 1,330 MGA/kg, i.e. 0.32 USD/kg.

The following graphic shows a comparison between prices (mine all the way to FOB) in the current situation, versus the mining groups scenario.

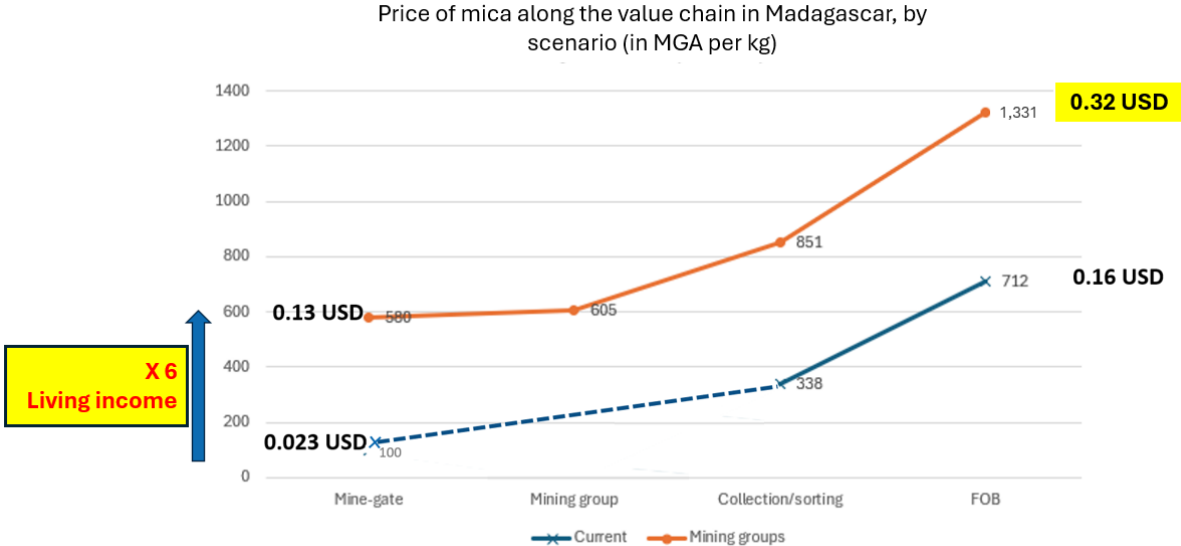


Figure 8. Price of mica along the value chain in Madagascar, by scenario (in MGA per kg)
 Source: BASIC and RMI, based on bibliography and interviews (2023)

5. Price impact on downstream products

Mica scrap from Madagascar arrives mainly in China, where it is either ground into powder or used as-is, to make mica filler for paints or mica paper and board, among others. (To the best of our knowledge, phlogopite mica is not used to make pearlescent pigments).⁴³ It is worth recalling that uses of mica for electronic insulation, as is common in cars, is outside the purview of our study. Within the perimeter of

⁴² This estimate is based on ILO et al. 2021, op. cit, pp. 34-35, where it is said that the productivity of female workers ranges from 10 kg/day to 80 kg/day. We also took into account, by comparison, the maximum quantity that workers could pick in India (which was 20 kg per day, in Jharkhand). The productivity of scrap mica workers is higher than in India because instead of sifting through old *dhibra* (debris) piles as in India, in Madagascar workers have access to fresh scrap leftover from mining activities.

⁴³ BASIC Interviews with mica sector experts, September-October 2023.

finished products studied by our inquiry, the following are products believed to be potentially derived from Madagascar scrap mica:

- Electric vehicle (EV) battery
- Vehicle droning insulation
- DIY paint (exterior/interior grade and anti-corrosion)

With 100% supply of mica coming from Madagascar, the impact of the “Mining groups” scenario on the price of these products is as follows:

Item	Current situation price	Mining groups scenario price	Change
Intermediate products			
EV battery	5,750 USD/battery	5,750.22 USD/battery	+ 0.22 USD (+0.004%)
Vehicle droning insulation	3.60 USD/kg	3.63 USD/kg	+ 0.03 USD (+ 0.694 %)
Final products			
Total EV price	36,856.70 USD/car	36,856.94 USD/car	+0.24 USD (+0.001%)
Total thermal vehicle price	28,210.12 USD/car	28,210.13 USD/car	+0.0099 USD (< + 0.0001%)
DIY exterior/interior grade paint	18.50 USD/kg	18.50 USD/kg	+0.0012 USD (+0.001%)
DIY anti-corrosion paint	25.00 USD/kg	25.01 USD/kg	+0.0062 USD (+0.025%)

Table 1. Modelled changes in the price of intermediate products and final products under the current situation, compared with the mining groups scenario. Source: BASIC, based on bibliography and interviews (2023)

6. Conclusion

The mica mining/picking sector in Madagascar is currently facing many challenges. It is marked by poverty and child labour, in a context of a drought-induced famine and the absence or high cost and distance of schools. Mica scrap in Madagascar sold at the mine fetches significantly less value than it does in India – the difference is more than fourfold. Mica miners and pickers have little bargaining power when selling their mica, and illiteracy compounds the problem.

While the mica sector is well-regulated from a statutory standpoint, regulations are not consistently applied. Informal facilitation fees are a regular feature of day-to-day business along the mica chain, particularly at the transport stage. In addition, formal documentation is sometimes photocopied and re-sold instead of being obtained through legal channels.

In order to remediate this situation, it has been proposed that mica mining communities organise themselves into “Mining groups,” as is provided for under Article 11 of the Mining Code. It is hoped that members of these mining groups can be paid a living income for their mica, contributing to their welfare and to the eradication of child labour. Under such a scenario, it is also assumed that only authorised taxes would be levied, meaning that informal facilitation fees along the chain would be eliminated.

To assess the impact of such a transformation of the mica sector, BASIC built a quantitative, dynamic model (<https://micavaluechain.lebasic.com/>) of how a living income at the mine level would ricochet

down the value chain, from the collection and export stages all the way to finished products. The main findings are the following:

- Current scrap mica prices are about six times lower than they should be to guarantee mica workers a living income. Instead of receiving 100 MGA/kg for their scrap mica, mica pickers should receive 580 MGA/kg.
- The wages of workers along the mica value chain are also between 1.3 and 2.6 times less than they need to be to guarantee a living income (depending on which position).
- The creation of village-level groupings of mica miners would raise the FOB price of mica scrap to approximately 1,331 MGA from 712 MGA.
- The impact on the price of finished products, however, is very small: an average price increase of 0.359% for intermediate products, and an average price increase of 0.0080% for finished products.

It is hoped that these findings may help inform stakeholders in their efforts to improve living conditions for all actors along the chain, particularly workers who do not currently make a living income and children who currently work in the mica value chain.