RESPONSIBLE MICA INITIATIVE

Establishing Fair Mica Worker Incomes and Wages in India and the Negligible Impact on Costs to Consumers

Fair Wage Network and BASIC Reports
Executive Summary and Consolidated Overview

MARCH 2023

Contents

Executive summary

The Responsible Mica Initiative (RMI) was established in 2017 to improve workplace practices and eliminate child labor in the mica processing and mining sector, starting in India's states of Jharkhand and Bihar. In its six years of work, RMI has introduced programs to improve workplace health and safety, return children to school, deliver vital health, education and government services to the villages providing labor for the mines, and implement state-of-art blockchain tools to monitor and secure the mica supply chain. In 2022, RMI sponsored research that can be used to identify, design and implement the next steps needed to improve the lives of mica-dependent communities and eliminate child labor.

The Need for a Living Income and Wage

Historically, a root cause of poverty throughout the region has been the low prices paid to villagers for the mica they collect or pick. Conditions have been exacerbated by the lack of a formalized market and supply chain transparency, leaving the supply chain susceptible to weak governance and ill-intentioned actors. These conditions have led to the payment of minimal prices for mica. To supplement meagre incomes and because village childcare and schooling has been virtually non-existent, parents had little choice but to bring their children with them to collect mica.

To date, RMI's three program pillars have created health and safety workplace standards for mica processors, implemented community empowerment programs bringing better schools, health and nutrition services, and access to government services to mica-dependent villages, and sought to create a legal framework for the mica sector. Those programs are the prerequisite for RMI's new initiative: to permanently change the eco-sphere of mica dependent communities and lift them out of poverty by paying workers fairly and raising the price of mica to do so. If parents earn enough on their own to support their families, they will not need to put their children to work. Paying adult-workers a living income or wage will play a key role in reducing child labor.

To accomplish this next phase of its work, RMI commissioned the Fair Wage Network (FWN) and BASIC to: (1) determine the amount of a living income or wage* in the two Indian states of Jharkhand and Bihar and (2) assess the economic impact of higher raw material prices on costs along the downstream supply chain and to end-market consumers.

Determining A Living Income or Wage - Key Findings

The combined findings of the FWN and BASIC reports conclude:

- A living income for a typical mica picker family of two adults and three children in rural Bihar and Jharkhand was estimated at 15,000 INR/month (~ 190 €/month). A living wage for a similar mica family member worker in a processing unit in an urban area of Jharkhand would need to be 17,000 INR/month (~ 210 €/month).

* The difference between "income" and "wage" are explained in the consolidated overview

- To achieve the target rural and urban living income and wage, the average price paid to mica pickers would need to be increased five-fold, raising the average price of mica to 41 INR per kilogram (~0.51 €/kg) from 9 INR per kilogram (~0.11 €/kg) using 2022 data.

- Paying a fair but higher price for mica – a price that would support families living in rural and urban areas - and include the costs of market formalization and implementation of responsible workplace practices, would almost always have an impact of less than a 0.1% increase in the cost of common end-products that use mica such as cosmetics, paints, and automotive coatings and parts, including batteries for traditional and electric vehicles, among others.

- The state of Jharkhand stands to benefit from increased tax revenues thanks to legalization of the sector and higher mica prices and worker wages and incomes. If mica pickers organize into cooperatives and the JSMDC (Jharkhand State Mineral Development Corporation) purchases and then auctions that mica at a living income or wage equivalent, total proceeds to the state from taxes on the scrap (dhibra) mica sector are estimated at more than US$13 million (€ 12.2 million) per year.

Goal and Implementation Steps

RMI's goal is by 2030 to work with mica supply chain members to ensure that (1) 100% of the village workforce engaged in mica picking in Jharkhand and Bihar receives the higher price per kilogram of mica recommended by FWN and BASIC and (2) that 100% of workers working in mica processing units and mines earn a living wage. The ability to achieve these goals depends on enhanced and new initiatives under RMI program pillars which will contribute to removing remaining complex barriers for change. These start with the length and related complexity of the supply chain and include the lack of a robust legal framework in sourcing country, where the sector is typically dominated by artisanal and informal mica collection, and the lack of supply chain transparency which impedes the ability to implement formal and verifiable payment mechanisms. These and other hurdles can be overcome with a matrix of strategies.

- **Strengthened Supply Chain Traceability** - A blockchain-based platform created in 2022 with Tilkal is the cornerstone of this work and already an enhanced version of the platform is under development. It will include supply chain mapping starting at the mica picking or mine level as well as information related to the ESG performance of each RMI member's upstream supply chain.
- **Expand Workplace Standards** - Provisions for paying a living income to workers at mica processors have been added to the Global Workplace ESG and Due Diligence Standard for Mica Processors. The standards will now be extended to mica mine sites to ensure that mica picker incomes will reflect the higher prices of mica as well as other provisions of the standards such as a prohibition on child labor and improved workplace health, safety and environmental requirements.
- **Establish a Minimum Mica Price** - The feasibility of setting an official minimum price for mica which would translate into a living income or wage will be discussed with government authorities.
- **Sector Formalization & Worker Cooperatives** – RMI will sustain its work with the Jharkhand and other government authorities to formalize the sector and include a provision that would create cooperatives for mica pickers.
- **International Support & Coalitions** – RMI will continue engagement with institutions committed to eradicating child labor as part of broader initiatives to improve working conditions for all workers and has recently joined the *Global Living Wage Coalition*.
- **Member Engagement** – In addition to their participation and financial support for RMI, members will continue to advocate with organizations to build support for and implement RMI programs.

RMI is confident that continued progress on these programs will provide the framework for success and enable us to work with members, program partners, and community and government leaders to lift mica pickers and workers out of poverty and create a fair, responsible and sustainable mica supply chain.

Consolidated overview of combined studies

Mica is a mineral used in a wide range of applications. Cosmetics, certain automotive and other specialty paints, electric vehicle batteries, electrical appliances and more rely on mica's exceptional optical and conductive properties. Mica is a family of 37 minerals mined around the world but India, and specifically the northeast states of Jharkhand and Bihar, remains one of the major sources of mica accounting for approximately 30% of global mica exports[1]. In these states, mica is collected mostly by artisanal miners and often associated with exploitative working conditions.

In India's "mica belt" that straddles Jharkhand and Bihar, high poverty associated with poor access to quality education, health and nutrition, as well as a lack of additional sources of livelihood, force many disenfranchised families to bring their children, sometimes as young as five years of age, with them to supplement their income by collecting mica with their parents. In Jharkhand and Bihar alone, it is estimated that around 30,000 children[2] work as mica pickers, collecting mica off the ground adjacent to mines. They are among the some 300,000 members of mica-dependent community villages that depend on the collection of mica for their livelihood.

Tackling the Challenge

Members of the industry that rely on mica together with NGOs focused on human rights and child labor formed the Responsible Mica Initiative (RMI) in 2017. RMI's mission is to establish fair, responsible and sustainable mica supply chains globally. Since its formation, RMI membership has grown from 30 founding members to 80 who by 2022 represented more than 50% of the volume of India's mica exports.

To fulfill its mission, RMI created a holistic, three program pillar approach to transform the mica eco-system in the region.

Pillar 1 – Responsible Workplaces

To create safe workplaces free of child labor RMI developed and introduced *Global Workplace ESG & Due Diligence Standard for Mica Processors.* To support implementation of the standard, RMI offers training for managers and workers as well as a third-party audit protocols to improve compliance.

At its inception, RMI members agreed to map their supply chains to promote the traceability and transparency of mica from mines to end-markets. In 2022, the initial mica mapping process was replaced with a more sophisticated and first of its kind blockchain-based traceability platform that would monitor not only member company mica transit but a wide range of ESG performance metrics along the mica supply chain.

Pillar 2 – Community Empowerment

To support the communities that supply the workforce for mica picking, RMI launched empowerment programs that, by the end of 2022, transformed the lives of 16,000 households in 180 mica-dependent villages. The programs provide additional sources of livelihood to reduce poverty, improved education, nutrition and health resources, and access to government sponsored social services.

[1] Source: UN Comtrade database, Nov. 2022 figures
[2] Source : TDH Germany June 2022 report, "Exploitation of Children in Mica Mining in India"

Pillar 3 – Legal Framework

In collaboration with members and partner organizations RMI has facilitated constructive discussions with the state governments of Jharkhand and Bihar, leading to the release of a new policy framework that would regulate mica collection activities as well as formalization of the sector in Jharkhand.

In addition to activities under each pillar, RMI also engages with a range of intergovernmental bodies such as the ILO and OECD, industry associations with programs committed to health, safety and protection of human rights in the workplace, and NGOs committed to eradicating poverty, promoting human rights and preventing child labor.

The Need for a Living Income and Wage

RMI's pillars and programs established the foundation for the next vital element of efforts to create a self-sustainable mica eco-system in the region: providing a living income or wage for workers in the sector.

Paying adults a living income or wage - sufficient remuneration to sustain an entire family – will have a direct impact on child labor reduction. Children would be more likely to remain in their villages to attend school and no longer be subjected to repetitive movements and carrying heavy loads under a burning sun. The region would better comply with ILO Conventions that define mining activities undertaken by those under 18 years of age, the worst form of child labor.

RMI commissioned two studies designed to chart a path forward, the first to define a living income and wage in the mica sector in India's states of Jharkhand and Bihar, a second to evaluate the economic impact on the mica supply chain of higher mica prices that would be needed to support increased income or wages.

Living Wage & Living Income Defined

As per the Global Living Wage Coalition[3], a *Living Wage* is "the remuneration received for a standard workweek by a worker in a particular place sufficient to afford a decent standard of living for the worker and her or his family. Elements of a decent standard of living include food, water, housing, education, health care, transportation, clothing, and other essential needs including provision for unexpected events".

Similarly, a *Living Income* represents the income equivalent for a worker who would not receive a regular salary nor a formal pay slip, but mainly a non-formalized income, like for instance a piece-rate payment.

Income and Wage Study by Fair Wage Network

The Fair Wage Network (FWN) was commissioned to define a fair price for mica in Jharkhand and Bihar that would contribute to a living income for mica pickers and a fair wage to mica workers in processing units. The FWN initiative seeks to improve wages along global supply chains by integrating proposed fair wage approach into all wage initiatives at the international and national level. Relying on its 12 years of experience, FWN expanded on its extensive database with on-field market surveys and both mica picker and processor worker interviews. The full FWN report - "*Report on Wages, Working and Living Conditions of Mica Workers in India"* – highlighted in this overview can be found in full starting on page 15.

Economic Impact Study by BASIC

RMI commissioned BASIC to assess the economic impact on the supply chain – from collection to the cost of finishing goods - of paying a fair but higher price for mica. Basic conducts social and economic analysis on value chains, including their governance and sustainability, to contribute to the public debate and support the social and environmental transition of actors and territories. Relying in part on FWN findings,

BASIC created a model of the structure of the mica value chain actors and products and assigned prices, costs, taxes and margins for each of the items in the value chain up to and including mica-based finished products. The model is hosted on a platform on BASIC's website. The full basic report – *"The Mica Value Chain from India to the World"* – highlighted in this overview can be found in full starting on page 58.

Report Findings

The reports conducted by the FWN and BASIC (1) identified the current income and wage structure in the mica sector, (2) proposed a minimum living income and wage, and (3) evaluated the economic impact on the mica supply chain of an increase in mica prices that would be needed to support higher incomes and wages.

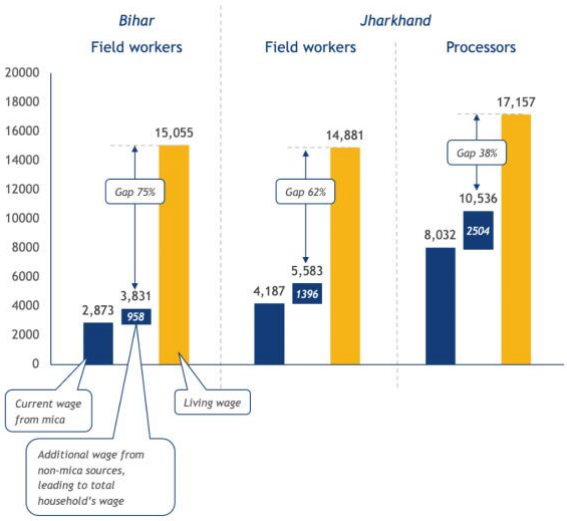
Proposed Increase in Incomes and Wages

The first finding of the report determined an acceptable living income and wage. A suitable living income for a typical mica picker family of two adults and three children in rural Bihar and Jharkhand was estimated at 15,000 INR/month (~ 190 €/month). A living wage for a similar mica family member working in a processing unit in an urban area of Jharkhand would need to be 17,000 INR/month (~ 210 €/month). Such levels of remuneration would support lifestyles and meet basic family needs, identified in the infographic to the right, and address the income and wage gaps described below.

Current Income and Wage Gaps

- In both Bihar and Jharkhand, mica pickers and their families commonly live in a precarious situation, with household incomes (~3,800-5,600 INR/month) that are significantly lower than the living income (~15,000 INR/month). Individual mica pickers also earn far less from their mica activity (~2,800-4,200 INR/month) than the legal minimum wage for unskilled workers (~8,500-8,800 INR/month). Accounting only for the household income from mica-related activities, the gap in living income reaches 81% for mica pickers in Bihar and 72% for mica pickers in Jharkhand. Furthermore, that income is not stable and does not provide access to government sponsored social security benefits as the income is based on the weight of mica collected on a given day and not on a scheduled salary scheme.

- In Jharkhand, the conditions of workers in processing units were found to be slightly better compared to mica collectors. Indeed, mica workers in processing units receive a regular wage and social security benefits. Nevertheless, workers were also found to receive a wage (8,000 INR/month) that is lower than the legal minimum wage (INR 8,800 INR/month) and lower than the living wage required for a typical family of two adults and three children (17,000 INR/month) living in an urban area or 53% less than needed.



- Mica pickers in Bihar and Jharkhand currently earn 10 and 8 INR/kg on average, respectively. To reach the minimum legal wage while collecting the same daily amount of mica, they should earn 30 and 18 INR/ kg, respectively. A high-level estimate for a fair price that would enable mica pickers to reach a living wage would be 52 INR/kg in Bihar and 30 INR/kg in Jharkhand, an average of 41 INR/kg based on the wages in each state.

- Mica related activities, either mica collection or employment in a mica processing unit, may not represent the only source of income for worker households. Total family revenue may be supplemented by farming and other activities such as running a small store or tailoring. However, even when additional sources of revenue exist, mica related activities still are expected to represent approximately 75% of total family income. Additional revenues from activities other than mica sightly close the gap in living income to 75% for mica pickers in Bihar, 62% for mica pickers in Jharkhand and in living wage to 38% for workers in mica processing units in Jharkhand.

The income and wage inequities explain the living difficulties reported by mica collectors and mica workers. They lack sufficient and stable remuneration for their labor to cover all their basic expenditures. They are not able to set aside money for savings or to have on reserve to help with unexpected expenditures in which case they must rely on loans on which the interest payments would only add to their financial burden.

End-Market Impact of Mica Price Increase

The third key finding of the report concludes that paying a fair but higher price for mica – a price that would support families living in rural or urban areas – would increase the price paid to mica pickers five-fold, raising the average price of mica to 41 INR (~0.51 €/kg) per kilo from 9 INR or (~0.11 €/kg) per kilo using 2022 data. In almost all instances, the mica market price increase would have an impact of less than a 0.1% increase in the cost of finished end-consumer goods as illustrated in the table below. While the majority of the higher price would directly benefit mica pickers, it also takes into account additional supply chain costs resulting from related RMI initiatives. The latter include costs associated with the implementation of responsible workplace practices as well as the costs associated with supply chain formalization under cooperatives, increased supply chain transparency and payment of all supply chain related taxes.

	Paint and coatings price (per KG)			Cosmetics price (per KG)			Vehicle price (per vehicle)	
Finished product	DIY anti-corrosion paint	DIY architectural paint (interior or exterior)	OEM refinish paint	Nail enamel	Eyeshadow	Lipstick	Thermal car	Electric car
Status quo (current) price	$ 25.00	$ 18.50	$ 105.00	$ 840.00	$ 1,750.50	$ 3,750.00	$ 28,128.45	$ 36,750.00
Estimated price, in case of legalisation + formalization under cooperatives + payment of a living income or wage	$ 25.12	$ 18.54	$ 105.01	$ 840.01	$ 1,750.88	$ 3,750.06	$ 28,128.60	$ 36,755.17
Evolution in %	+0,48%	+0,22%	+0,0095%	+0,0012%	+0,022%	+0,016%	+0,0005%	+0,014%

The prices of finished goods studied in the survey are based on current end-market prices as of 2022 and costs associated with the legalization and formalization of the supply chain and payment of living incomes and wages recommended by FWM and BASIC.[3]

Towards Securing Fair Incomes and Wages

Fair incomes and wages are recognized as a key component of human rights and due diligence measures. In particular, providing sufficient incomes and wages to adults and enabling parents to sustain their entire family are highly likely to have a direct impact on child labor reduction. If families could earn a living income or wage, current mica child laborers can be expected to recover their childhood, attend school, and realize their potential. The fact that the economic barriers to ensuring a living wage or income upstream are negligible for a low value mineral like mica makes it a good supply chain mineral with which to begin efforts to adjust market prices. A successful mica case study could then pave the way for adjusting price in other mineral supply chains.

[3] Source: BASIC, January 2023 survey "The mica value chain from India to the world"

Goals

The FWN and BASIC findings provide the essential income, wage and mica price data, including an assessment of the economic impact of paying fair mica prices on finished products containing mica, to enable RMI to establish long term targets for change. The ability to achieve these targets will be enabled by programs already underway under RMI's three program pillars. Improved workplace standards along the supply chain in India will raise awareness among operators for the need to provide fair wages to workers. Adoption of sophisticated, blockchain mica supply chain mapping and transparency was a key tool that enabled for BASIC's analysis of the economic impact of higher mica prices. Formal government recognition and legalization of the sector will provide enforcement mechanisms to prohibit illegal trade in mica which has dominated the sector and taken advantage of disenfranchised mica pickers and their communities.

Incremental Goals Toward Establishing Fair Incomes and Wages in the Mica Sector

Given the complexities of the transformation needed, RMI plans to have 100% of mica pickers and workers in the Jharkhand and Bihar supply chains receiving a living income or wage based on a fair price for mica by 2030. The steps and timeline for achieving this goal include:

1. **By 2022, define a living wage for mica workers** in processing units and a fair price for mica contributing to a living income for mica pickers. Assess the economic impact of an increase in the price of mica per kilogram. (Project completed)
2. **By 2025, ensure 100% of mica workers benefit** from a clear and enforced legal framework in Jharkhand; by 2030 in Bihar.
3. **Create and leverage a legal framework** to formalize the upstream mica pickers under cooperatives, officially registering all of them and allow them to open individual bank accounts.
4. **By 2025, ensure that 50% of mica volumes from Bihar and Jharkhand are compliant with and audited against the *Global Workplace ESG and Due Diligence Standard for Mica Processors*;** 100% by 2030. The standard includes the ban on child labor, the obligation to pay a legal minimum wage and the longer-term goal of providing a living wage.
5. **By 2025, ensure that an additional 30% of mica volumes from Bihar and Jharkhand are compliant with and audited against *Responsible Workplace Standards for Mica Collection*;** 100% by 2030. The mica collection standard, which has yet to be developed, will include a ban on child labor, the obligation to pay a price for mica that will support the income equivalent of the legal minimum wage, and an objective to pay a price for mica supporting a living income.
6. **Strongly advocate for payment of a living wage to workers** employed in mica processing units.
7. **Accelerate transition towards payment of a living wage for mica pickers** by setting a minimum price per kilogram for mica at the State level. This minimum price would correspond to a price that would contribute to a living income as defined in the FWM and BASIC reports, adjusted for fluctuating economic variables as required.
8. **By 2030, ensure that 100% of the mica pickers and processor workers** within RMI member supply chains that originate in Jharkhand and Bihar receive a living income or wage based on a fair price for mica.

Implementation Steps

To reach the 2030 target, RMI will move forward with programs across all program pillars and, in particular, ensure that higher mica prices will directly benefit mica pickers. There remain several challenges that must be overcome to achieve this goal. Key among the challenges are the sheer length and complexity of the mica supply chain, the artisanal and informal aspect of upstream mica picking, and the lack of robust legal frameworks and formal payment mechanisms. As well, there is a lack of examples from other industries that could serve as models for a solution.

To address these critical barriers to change and achieve our 2030 goals, RMI will maintain and amplify programs under each of its three pillars.

1. **Strengthen Supply Chain Traceability** – The many tiers of the mica supply chain from mines and processors in India to end market producers requires visibility into actors, prices, incomes and wages, taxes and other levies. Traceability will be vital before and even after sector formalization is established to ensure constant visibility into payments and to ensure that control systems are maintained. The blockchain-based platform created by Tilkal is the cornerstone of this work.Already, an enhanced version of the platform is under development which will include supply chain mapping starting at the mica picking or mine level as well as information related to the ESG performance of each RMI member's upstream supply chain.

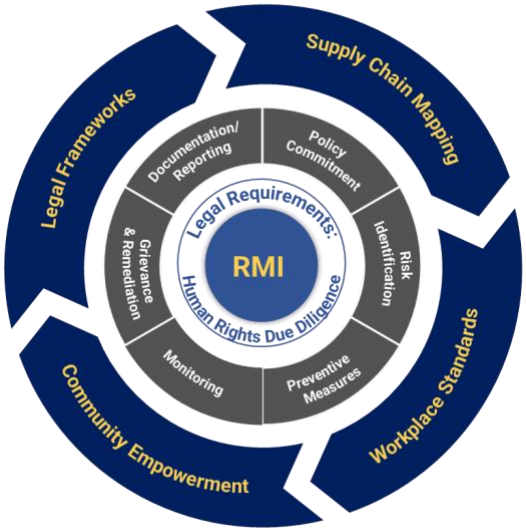
2. **Expand Workplace Standards** - Provisions for paying a living income to workers at mica processors will be encouraged, as stated in the Global Workplace ESG and Due Diligence Standard for Mica Processors. RMI has already hired a dedicated person in India to facilitate in-person training to help mica processors adopt and comply with the standards. The workplace standards also will be extended to mica mine sites to ensure that mica picker incomes will reflect the higher prices of mica as well as other provisions of the standards such as a prohibition on child labor and improved workplace health, safety and environmental requirements.

3. **Establish a Minimum Mica Price** - The feasibility of setting an official minimum price for mica which would translate into a living income or wage will be discussed with government authorities. If agreed and enforced at the sourcing level, a minimum price would de-facto apply and cascade downstream to all industries using mica while uniformly benefiting the entire mica picking community.

4. **Sector Formalization & Worker Cooperatives** – RMI will sustain its work with the Jharkhand, Bihar and other government authorities to formalize the sector and include a provision that would create cooperatives for mica pickers. A cooperative would formally register its members, recognize a minimum fair price for mica and prohibit the use of child labor, among other features. Notably, in 2022 the Jharkhand government announced its willingness to roll out the cooperative model presented in 2021 by RMI and resulting from a multistakeholder consultation process. RMI will continue to participate in the taskforce created by Jharkhand government to advance this proposal and also discuss the introduction of a minimum price for mica.

5. **International Support & Coalitions** – RMI will continue engagement with institutions committed to eradicating child labor as part of broader initiatives to improve working conditions for all workers. Reflecting RMI's newest initiative focused on incomes and wages, in 2022 RMI joined the discussions hosted by the *Global Living Wage Coalition* which is committed to enabling workers around the world to afford a decent life for themselves and their families.

6. **Member Engagement** – In addition to their participation and financial support for RMI, members can participate on an individual basis with organizations to build support for and implement RMI programs. Members also join RMI or speak on behalf of RMI work at forums designed to elevate awareness of child labor issues and the role that can be played through private-public sector partnerships to advance solutions. Wherever RMI's voice is heard the *UN Guiding Principles on Business and Human Rights* (UNGPs) serve a vital baseline for goals, strategy and programs.



RMI and its members are confident that pursuit of these six broad initiatives, implemented within RMI's program pillars, will enable workers in the mica sector to receive living incomes and wages by 2030. While working on these pillars, RMI has embraced the *UN Guiding Principles on Business and Human Rights* (UNGPs) and incorporated its due diligence processes, offering to RMI members a concrete answer to existing and upcoming Human Rights & Due Diligence regulations, on the specific mica case.

Mica processing, India

RMI Member Case Studies

RMI's work is supported by the efforts of its individual members. In this section, two member companies share stories of their work to utilize RMI resources and apply RMI strategies.

MERCK KGaA

As a vibrant science and technology company, we believe in science as a force for good. Our passion for science and technology is what drives our 62,770 employees across 66 countries to find solutions to some of today's toughest challenges and create more sustainable ways to live.

For more than 350 years, responsibility has been an integral part of our corporate identity. It is one of our six company values, alongside courage, achievement, respect, integrity, and transparency. We seek to balance environmental, social and governance aspects – for patients, customers and business associates – and find solutions for the world of tomorrow. Respecting and supporting human rights is an integral part of our responsibility. We place the highest demands regarding compliance with social and environmental standards not only on our own processes but also on our suppliers.

Mica is an important raw material for our effect pigments, which are used in automotive, cosmetic and industrial coatings as well as plastics. We procure the majority of our mica from the Indian states of Jharkhand and Bihar. We have taken special measures to comply with high social and environmental standards in our mica supply chain.

We source our material only from suppliers acting in a formal working environment as this is the only way for us to monitor compliance with our strict standards, including our refusal of child labor. In the past years, we have set up a direct supply chain and established a comprehensive system of control mechanisms in our sourcing process. These include close monitoring and auditing of our suppliers, as well as continuous review and improvement of our processes, including third parties.

We see the implementation of the living wage concept developed by the Responsible Mica Initiative in our mica supply chain as an important step towards improving the livelihood of workers and their families and sending an important signal across the entire mica supply chain and dependent industries. Consequently, we are able to quickly implement living wage at our mica suppliers already in 2023.

Since we have entirely changed our supply chain setup more than 10 years ago and have established related oversights mechanisms, we have the ability to both agree with our suppliers on a defined and contractually fixed workers´ salary and monitor the actual payment to them working in a formal working environment. Already, our suppliers have paid fixed salaries, independent of mica volumes, which are significantly above the average income presented in the Fair Wage Network (FWN) report and are even close to the values now agreed upon as a living wage.

Starting during 2023, Merck will request from suppliers that all workers employed in their Indian mica supply chain, whether employed at mines or in mica processing units, receive a monthly salary at or above the living wage (independent of volumes) as defined in the FWN report. Merck will hold supply chain actors accountable to meet these goals. We are convinced these measures are important steps in the right direction and will allow workers and their families to meet their basic needs at decent standards, based on calculated cost of living in Northeast India.

Natura &Co

Natura &Co is a global purpose-driven group made up of four iconic beauty companies – Avon, Natura, The Body Shop and Aesop. We operate in more than 100 countries, with over 3,700 stores, 35,000 employees and 7.7 million Representatives and Consultants. We believe in challenging the status quo to promote real positive economic, social, and environmental impact. We are proud to be the world's largest B-Corp™.

At Natura &Co, our sustainability vision, Commitment to Life, calls for an approach to business that gives back more than it takes, including in our procurement activities. As part of this vision, we recognize that some materials we use have significant social or environmental concerns. Therefore, we aim for full traceability and/or certification of our critical supply chains (palm, soya, ethanol, mica, cotton, and paper) by 2025.

Natura &Co uses mica scrap in small quantities (approximately 30 metric tons a year) primarily as an ingredient in our cosmetic products. Although the volumes that we source are very small compared with some other industries using mica, we understand that, together with our suppliers, we have a role to play in improving the sustainability of the supply chain we use. In 2022, we formally laid out our mica sourcing requirements in the form of a publicly available Sustainable Mica Procurement Policy.

All natural mica supplied to Natura &Co as a cosmetic ingredient or part of finished cosmetic goods must meet the sustainability requirements set out in Natura's *Sustainable Mica Procurement Policy for Suppliers* document. Our deadline for this is by the end of 2025 at the latest. The relevant suppliers are expected to accept the policy as a requirement of sustainability onboarding performance screening, provide traceability information (such as information on primary mica processing sites and collecting locations) and present an independent third-party audit against the Global Workplace ESG & Due Diligence Standard for Mica Processors from the Responsible Mica Initiative, or equivalent by the end of 2025. With 35.2% traceability achieved in 2021, we're on the path to achieving this target. We trust that we'll be able to achieve 100% traceability and 100% third-party verification by 2025.

We are confident that traceability, setting workplace standards and verifying workplace practices against those standards are instrumental tools that will support effective adoption of living wages and incomes for mica workers and pickers, and improve their working conditions and livelihoods. However, the complexity of our mica supply chains also means that these goals can only be achieved in collaboration with other mica users and processors. Therefore, our membership in the Responsible Mica Initiative remains a pivotal resource on the path to success. We also encourage our suppliers and others to participate in collaborations such as the Responsible Mica Initiative to play their part in working to end labor exploitation, dangerous working conditions and environmental damage in the mica scrap sector.

About the Responsible Mica Initiative

RMI Mission

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 labor.

RMI uses a multi-stakeholder and holistic approach that engages companies, civil society organizations, 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.

About mica and mica sourcing

Mica is a versatile mineral with a wide range of applications across electrical appliances, paints, heavy industries, cosmetics, electronics, automotive and plastic industries, among others. The global market for mica has grown by 20% in export volume between 2016 and 2021[4] and is expected to expand further in the coming years due to the energy transition. Mica is used as an insulator in a typical electrical vehicle, as a component of solar panels and wind turbines, and more. According to the British Geological Survey, the Indian states of Jharkhand and Bihar, and in particular the Koderma District of Jharkhand, have some of the largest mica deposits. However, a large percentage of mica procurement does not occur legally.

Before 1980, India had 700 legal mica mines in operation, most of them in the state of Jharkhand. A global dip in demand in the 1960s distressed the economy in the region. In 1980, the mica sector was further adversely impacted by the enactment of the Forest Conservation Act which banned mica mining inside forested areas where mica collection now occurs without a legal framework. With renewed demand for mica, traders and operators have illegally accessed hundreds of abandoned mines where mica continues to be collected. In the absence of alternative means of livelihood villagers engage in both surface and deep mining to collect mica in an unregulated environment which presents unsafe working conditions including the worst forms of child labor. Field research by Terre Des Hommes Germany in 2022 revealed that at least 30,000 children were involved collecting mica in the region.

Appendix

- Fair Wage Network Report - India
- BASIC Economic Report - India

Contact

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Report on wages, working and living conditions of Mica workers in India

Executive Summary

This report is the outcome of a project carried out by the Fair Wage Network (FWN) under the direct request of the Responsible Mica Initiative. The triple objective of the study was first to define a living wage[1] for mica workers, second to better identify wage and working conditions of workers involved in mica collection and processing activities in Bihar and Jharkhand states - India, and finally to highlight some of the internal pricing mechanisms in the mica supply chain.

For this purpose, surveys were carried out by the FWN in the summer of 2021 among actors of the very upstream of the mica supply chain. First mica collectors living in villages of the mica belt in Bihar and Jharkhand were interviewed, as well as workers in mica processing activities located in Jharkhand. These workers' surveys were complemented by interviews of other actors such as managers of processing units and intermediaries (also called transporters) who buy mica out of the mica collectors, and then sell it to processing units or to other actors such as aggregators and brands.

Price surveys among local markets and local shops were also carried out to accurately capture the prices of basic commodities.

As a results of the field surveys, FWN was able to capture an accurate overview of the financial situation of a typical mica-dependent household, that is described in the full report. The key take-aways of the study are as follow:

- Overall **living wage** for a typical family of two adults and three children in **rural areas** of Bihar and Jharkhand states, hence for mica pickers' families is estimated to be **15,000 INR/month** (around 190 €/month).
- Overall **living wage** for a typical family of two adults and three children in **urban areas** of Jharkhand state, hence for families of a mica worker in processing unit is estimated to be **17,000 INR/month** (around 210 €/month).
- In both states Bihar and Jharkhand, **mica pickers** and their family are living in a precarious situation, the families earning overall wages (~3,800-5,600 INR/month) that are significantly lower than the living wage (~15,000 INR/month). Individual mica pickers also earn far less (~2,800-4,200 INR/month) than the legal minimum wage for unskilled workers (~8,500-8,800 INR/month). Accounting for the revenues from mica-related activities only, the gap in living wage reaches 81% for mica pickers in Bihar, 72% for mica pickers in Jharkhand. Their income is not stable nor coming from a secured source, they usually don't have access to social security benefits.
- In Jharkhand, the conditions of **workers in processing units** were found to be slightly better compared to mica collectors. Indeed, mica workers in processing units receive a regular wage and social benefits. Individual workers were however also found to receive a wage (8,000 INR/month) lower than the legal minimum wage (INR 8,800 INR/month) and lower than the living wage for a typical family of two adults and three children (17,000 INR/month) living in an urban area (gap of 53% versus family living wage).
- Mica pickers in Bihar and Jharkhand are currently and respectively earning 10 and 8 INR/kg. To reach the minimum legal wage while collecting the same daily amount of mica, they should earn respectively 30 and 18 INR/ kg. A high-level estimate of a fair price for mica

[1] The living wage is defined as the total income that income earners in a household would need to cover the entire household's basic needs. It depends on several variables and parameters, like the size of the family, the number of income earners in the household, the price of local goods and services, … It varies with time and space for a given supply chain.

enabling mica pickers to reach a living wage would be 52 INR/kg in Bihar and 30 INR/kg in Jharkhand.

- Mica related activities (mica collection or working in a mica processing unit) do not represent the only source of income for the workers' households. The total revenue also relies on farming and other activities (small shop, …). Mica related activities nevertheless represent approximately 75% of the total family income. Additional revenues from other activities than mica sightly close the gap in living wage to 75% for mica pickers in Bihar, 62% for mica pickers in Jharkhand and 38% for workers in mica processing units in Jharkhand.
- This, coupled with the above conclusions, explains the living difficulties reported by mica collectors and mica workers. They lack sufficient and stable enough incomes to cover all their basic expenditures, they are not able to make any saving, nor to face unexpected expenditures and have to recourse to additional loans in case of unexpected event.
- As reported by the vast majority of actors – mica collectors, processors, and intermediaries – the revenue redistribution within the mica supply chain was found to be greatly unbalanced, where a few actors have a stronger bargaining position than others. It was found that the stronger the financial situation of a specific actor is, the stronger its bargaining power. In other words, the sales seem to be controlled by those who have liquid cash: the aggregators over intermediaries, the intermediaries over the mica collectors, all the more as they need immediate money for day-to-day subsistence.
- Finally, aggravating factors were identified such as the lack of clear legal regulations or the sufficient knowledge of workers on the supply chain, mica quality, …

In conclusion, a few leads were presented as possible improvements:

- The development of a clear legal framework and its enforcement is a key prerequisite on the path toward the improvement of wage and working conditions of mica workers. In such regulation, one could imagine that a minimum price for mica or minimum wage for mica pickers would be set up, depending on their ability to excavate, collect, and pick mica over a given duration. Pricing mechanisms could be modeled based on best practices identified in other supply chains.
  In any case, regulations should ensure a minimum price control to avoid underpaid mica to pickers.
- In order to guarantee the protection of the health and safety of mica pickers, transportation means could also be made available for mica pickers who travel long distances from home to mining sites. The location of collection centers needs to be thought through, so the mica pickers/collectors do not have to carry back heavy bags manually. The provision of PPEs would be required to mica pickers, and training or awareness raising campaigns should be set up so that mica pickers are aware of health and safety risks and ways to be protected against them.
- Empowering mica-dependent households to come out of the poverty situation they are living in is a key prerequisite to eradicate child labor. As part of this empowerment, the payment of a living wage would contribute to enable households to cover their basic needs without requiring to the additional revenue coming from the children's work. On top of ensuring the payment of a living wage, awareness raising on the importance of education, access to a quality education for all children and linkage with the government services mica pickers are eligible to are a few contributions to the systematic change that is required in the mica belt to eradicate child labor.

- The global level of knowledge and awareness of mica pickers and mica workers in processing units should be addressed, through trainings or dedicated sessions. They should be trained on price determination mechanisms.
- Finally, the set-up of collective organizations of pickers and/or workers would contribute to improve their bargaining power upstream of the mica supply chain. Increased mica quantity to sell would be leveraged when negotiating with intermediaries.

Similar surveys are planned to be carried out in Madagascar in the course of 2022, with the same objective to estimate the living wage of a typical mica picker in the south of Madagascar, his/her current wage, and the potential gap there is with the living wage.

Table of content

Introduction

The aim of the study is to complement the work that is done by the Responsible Mica Initiative on working conditions of workers in mica supply chains by a series of surveys on wages and living conditions in India.

Main objectives

The aim of the study was to collect empirical evidence to better identify:

- The wages and working conditions of workers involved in both mica collection and mica processing units,
- Current practices and mechanisms for paying mica workers and artisanal collectors, and workers in processing units,
- The potential gap between workers' income and living wage thresholds,
- The root causes of current level of wages and prices,
- The barriers and constraints to paying a living wage notably through a description of the payment and trading activities of mica.

The Fair Wage Network is a non-profit organization with expertise in wage issues, that enjoys international recognition for its impartiality and quality of research. This field work has been done in partnership with Sentio Advisory, which is the representative of Fair Wage Network in India and other South-East countries[2].

Methodology and outline of the full report

The main source of data is a series of interviews carried out with mica collectors, intermediaries (transporters), workers and managers in processing units, with the objective to collect the view of all actors involved in mica related activities and to better identify the good practices and possible areas for improvement.

The report will first present the results coming from the mica workers involved in mica collection, before looking at those involved in mica processing units where management was also interviewed to have the full picture. Additional interviews of intermediaries (transporters) allowed us to capture an additional segment of the mica supply chain.

Based on the different outcomes providing one perspective of the internal functioning of the Indian mica supply chain, policy recommendations are suggested to improve mica workers' wages and working conditions and to lead to a better trading and redistribution process within the mica supply chain.

Field work and interviews of mica pickers/collectors

The field work was carried out in July 2021 in the two states of Bihar and Jharkhand, and more precisely in the mica belt (see Figure 1). Two districts were especially targeted in Jharkhand: Giridih and Koderma, and two in Bihar: Navada and Jamui.

[2] Report lay-out, most texts and infographics created by the Responsible Mica Initiative, based on data and preliminary report provided by the Fair Wage Network.

Interviews were carried out in two phases: first with groups of a few workers who were then individually interviewed.[3] Since workers involved in mica picking activities are coming from several different villages, these workers were regrouped in selected villages for conducting the interviews.[4] In total, 140 workers participated in our survey (see the sample and its features in Table 1 below).

Villages were selected based on the local knowledge and feedbacks of the Country Manager of the Responsible Mica Initiative and RMI's local CSO partners[5], on the most active mica collection sites and most representative mica-dependent villages.[6] Eight villages were selected to carry out the interviews, according to the availability of mica workers. Access to mica mines was not permitted.

Additionally, market surveys were undertaken in both rural as well as urban areas to verify the cost-of-living goods.

Figure 1. Map of India, and location of the study in Bihar and Jharkhand states

[3] The anonymous nature of the interviews was explained to the workers, with the commitment that individual workers' name, or any other identifying information would not appear alongside their responses that will rather be analyzed with the responses of other respondents to form the basis of the present report. Workers were free not to answer a question and could end the interview at any time. The interviews lasted roughly 40 minutes and were kept flexible according to workers' responses since the objective was to get the most accurate picture of workers' individual situation.

[4] For Jharkhand, interviews in the district of Giridih (21-23 July 2021) of workers from the following villages: Rajpura; Dharve; Bendro. Interviews also in the district of Koderma (25-26 July) for workers coming from the villages: Dhab; and Sewatand. For Bihar, interviews in the district of Nawada (27-28 July) for workers coming from the villages: Gopalpur; and New Singer. Interviews also in the district of Jamui (29 July) for workers from the village Mariam Pahari.

[5] CSO: Civil Society Organizations. RMI has 8 local CSO partners – local NGOS – which are implementing Community Empowerment Programs in mica-dependent villages.

[6] The FWN would like to thank Mr. Vijay Jain from RMI India who coordinated this exercise and his local contacts.

Table 1. Basic information about mica field workers and processors in Bihar and Jharkhand who were interviewed during the study

	Bihar *(Field Workers)*	**Jharkhand** *(Field Workers)*	**Jharkhand** *(Processors)*
Number of surveyed workers	45	55	40
Average number of income earners per household (all activities included)	2.6	2.5	2.1
Average age of workers (years)	36.3	38.3	41.8
Average tenure of workers in current employment (years)	11.6	16.5	8.8
Average number of children per household (according to the interviews on the ground)*	1.9	3.9	1.7
Average number of children per household (according to the census data, 2011)*	3.0	2.8	2.6
Male to female ratio of surveyed workers	Males: 28.9% Females: 71.1%	Males: 56.4% Females: 43.6%	Males: 42.5% Females: 57.5%
Marital status of surveyed workers	Married: 100%	Married: 98.2%	Married: 97.5%
Education level of surveyed workers	Not Educated: 97.8% High School: 2.2%	Not Educated: 58.2% Primary School: 12.7% Secondary School: 1.8% High School: 25.5% University: 1.8%	Not Educated: 65% Primary School: 30% High School: 5%
Percentage distribution by skill categories of surveyed workers (according to Indian laws)	Unskilled: 100%	Unskilled: 100%	Unskilled: 82.50% Semi-skilled: 15% Skilled: 2.50%
Percentage of local workers and migrant workers	Locals: 100%	Locals: 100%	Locals: 100%
Distribution by designation / position of surveyed workers (%)	Digging/ Collecting: 100%	Digging/ Collecting: 83.64% Filtering/ Segregating: 16.36%	Grinding: 15% Sorting: 52.50% Others: 32.50%
Distribution by type of employment: permanent / temporary (%)	NA, Self Employed	NA, Self-employed	Permanent: 100%
Distribution by employment category: direct/contractor (%)	NA, Self Employed	NA, Self-employed	Direct: 100%
Distribution in terms of owned/ rented place of stay (%)	Owned: 100%	Owned: 100%	Owned: 97.50% Rented: 2.50%
Travel distance from home to site (Average, km)	12.67 km	4.24 km	NA
Time taken to travel this distance (Average, hours)	3 hours 41 min	1 hour 3 min	NA

* About the average number of children per household:

- 18-year old or younger children of a given household who rely on adults' wage are accounted for when estimating the living wage. The number of children per household from the census data was considered in the report and estimates instead of the estimate from the interviews.
- Adult offspring of parents who are not reliant on their parents' income or who have their own source of income are not considered children for the purposes of estimating the living wage.

1. Mica workers' activities

Type of work and location

The survey first aimed to understand the type of activity carried out by the pickers – mostly self-employed workers and a majority being women – as well as the location of the workplace (distance between their home and the workplace).

Though all interviewed workers were involved in mica activities, there were differences between the two states:

- In Bihar, the field workers were mainly working in Dhibras (98%) in open cast rather than working in ancient mine sites (2%). All (100%) were involved in digging.
- In Jharkhand, it was more diversified between Dhibras (38%) and working in ancient mine sites (62%), with a majority working underground (77%). 84% were digging while the remaining 16% of the workers were also involved in filtering / segregating (Figure 2).

Risks related to work

Several risks were identified in association with mica-related activities:

- Pickers / collectors need to carry back home heavy weights manually, with 20 kg to 30 kg in bags mounted on their heads. And this has to be done over several kilometers – from their home to their workplace, workers are walking 1 hour in Jharkhand and up to 4 hours in Bihar (4 km on average compared to nearly 13 km).
- Working conditions were found to be hard: exposure to dust and to several health risks (joints and muscular aches and pains, skin abrasions, tuberculosis, asthma and breathing disorders were common ailments many of them suffered from).
- In interviews with workers (mica pickers and mica collectors), some workers indicated that government officials from the forest department and the police confronted workers for illegal excavation and collection of mica. Since no license nor lease are issued by the government for mica sites, all mica-related activity in these locations is deemed illegal. Pickers and collectors reported having to pay bribes to Government officials. Workers reported that intermediaries may also deduct a percentage from the saleable weight due to assumed impurities[7].
- Finally, the older kids often accompany their mothers /parents and help them in the process.[8] It was found that one of the villages did not have a school. In the others, the schools were barely functional or located far away.
- Workers in processing units also encounter difficult working conditions. Despite the dust generated by grinding, sorting, and sifting operations, workers engaged here were not wearing appropriate PPEs. Here as well, it was also found that tuberculosis, cough, asthma were common ailments.

7 Considering these allegations, RMI is working towards improving the conditions for mica workers via three pillars (Responsible Workplace Standards, Community Empowerment Program and Legal Frameworks). RMI has not independently verified these allegations or discussed them with government representatives and takes no position as to their veracity, but notes that these allegations are a concern of mica collectors.

8 This process cannot be quantified since these were responses from the villagers during the random interviews conducted at the villages.

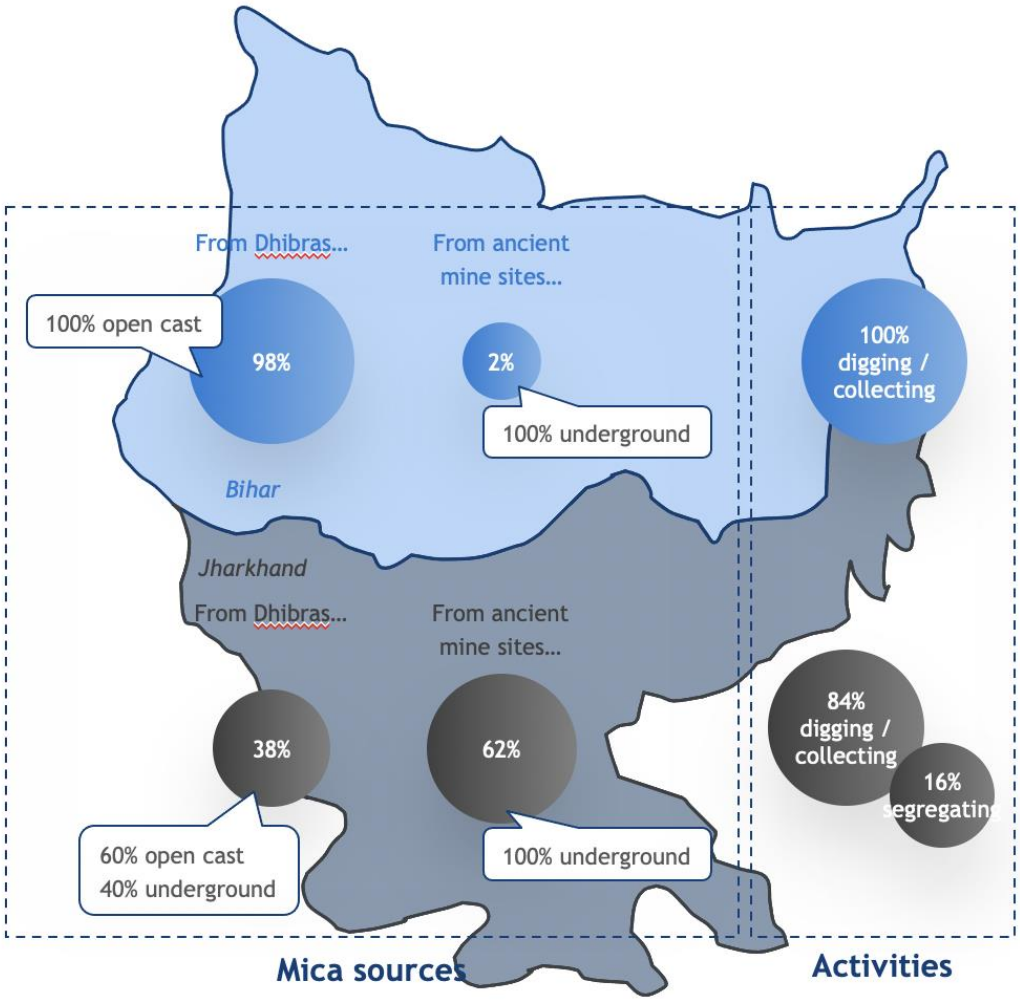

Figure 2. Source of collected mica, mining location and type, processes mica workers are involved in (2021 estimates)

2. Basic Pay and working arrangements

Differences between pickers and processors

In Bihar, most pickers are paid on a daily basis (61%), the remaining ones being paid on a weekly basis (39%), while in Jharkhand, 100% of pickers are paid on a weekly basis (Figure 3). In both regions all pickers are paid based on the weight of collected mica (Figure 4).

Not surprisingly workers involved in processing activities in Jharkhand, a more formalized manufacturing activity, were mostly paid through salaries on a monthly basis (70%, the remaining 30% were paid on a weekly basis). All were paid on a time basis (Figure 4).

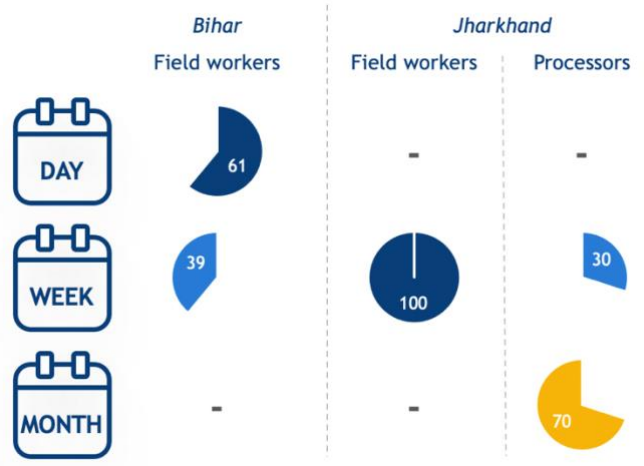

Figure 3. Payment frequency of field workers and processors in Bihar and Jharkhand (%, 2021 estimates)

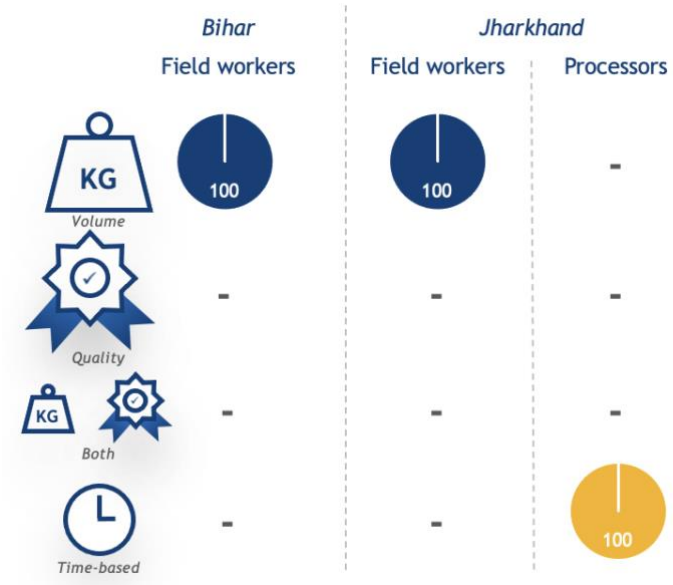

Figure 4. Basis for payment of field workers and processors in Bihar and Jharkhand (%, 2021 estimates)

Differences by location

Pickers in Bihar work in average 6.6 hours a day, when pickers in Jharkhand work almost 8 hours a day. The quantity of daily collected mica was found to be higher in Jharkhand (19 kg) compared to Bihar (11 kg).

The difference of quantity is assumed to be a direct consequence of the difference of daily working hours which in turn is assumed to reflect the different distances from home to work in the two states. Indeed, as already stated above, the average distance between home and workplace in Bihar was found to be 13 km when in Jharkhand, it was found to be 4 km.

As a result, the effective working hours including transportation are found to be 10.25 hours for pickers in Bihar and 9 hours for pickers in Jharkhand, for a lower quantity of mica collected during the day. Pickers in Bihar obviously encounter a key issue related to time dedicated to commuting (home-workplace transportation) which is not contributing to the household's income.

For workers in processing units, the regular working time is 8 hours a day (Figure 5).

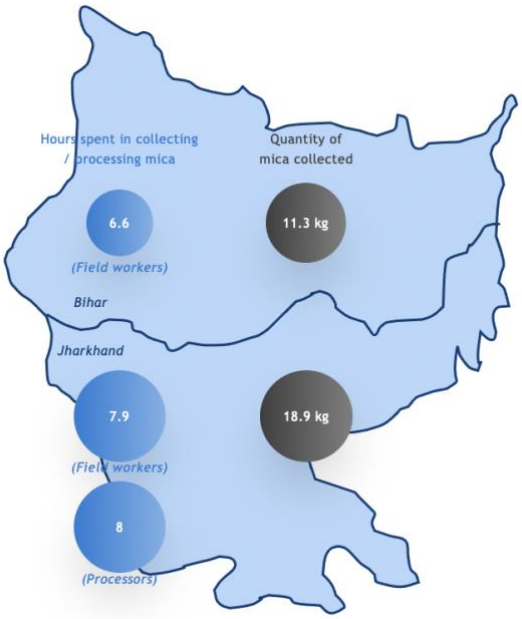

Figure 5. Hours spent in collecting or processing mica, associated to quantity of mica collected per day, in Bihar and Jharkhand (2021 estimates)

3. Mica/Dhibra collection: Quality, variety, and size

What quality?

Interviewed mica pickers are collecting crude mica and not waste mica in both states of Bihar and Jharkhand (Figure 6).

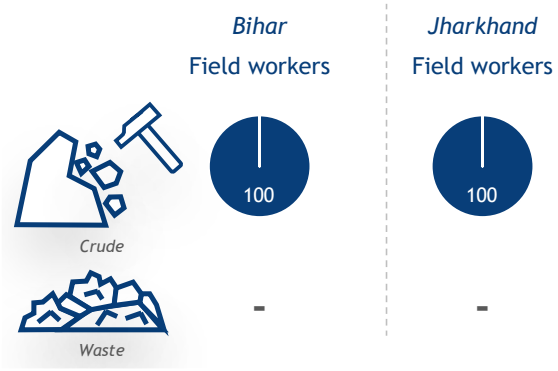

Figure 6. Quality of mica collected by mica field workers in Bihar and Jharkhand (2021 estimates)

What variety?

In both states, mica pickers report to collect mica of medium quality (Figure 7), with interestingly no worker reporting mica of low quality or mica of high quality. As it is later demonstrated in the report, this result might have come from the limited knowledge of mica pickers regarding the type of mica and the quality differences that may arise among different deposits. This lack of awareness could unfortunately influence their bargaining position when selling the product of their work.

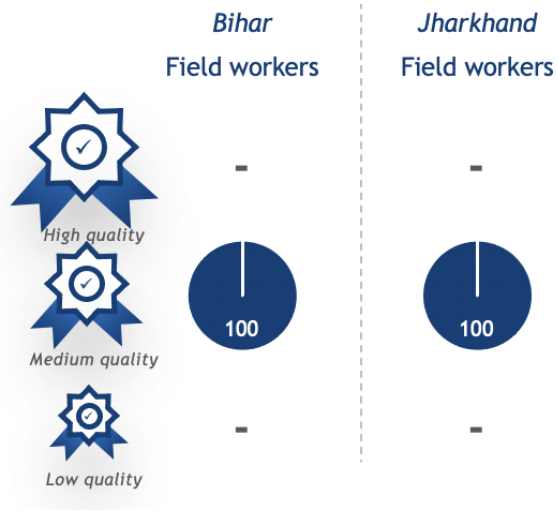

Figure 7. Variety of mica collected by field workers in Bihar and Jharkhand - high, medium, or low quality (2021 estimates)

What size?

Mica pickers generally reported mica of small size, with an exception in Jharkhand where 15% of workers reported mica of medium size (between 2 and 6 inches) (Figure 8).

Smaller pieces of mica are usually cheaper ones. Therefore, it seems that the large majority of mica pickers in Bihar and Jharkhand are collecting small, hence cheap, mica pieces, which does not contribute to enhance their revenue.

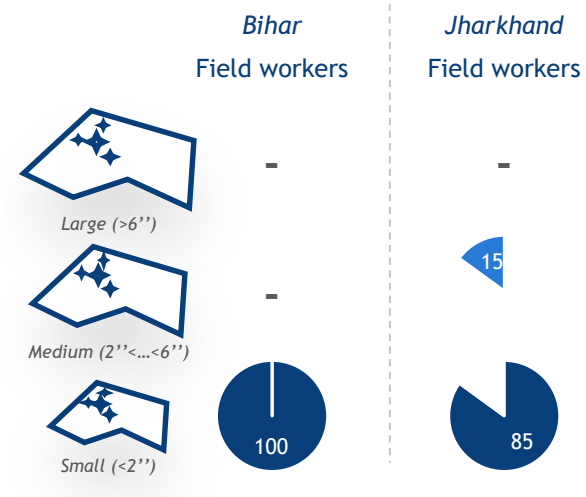

Figure 8. Average size of pieces of mica collected by mica field workers in Bihar and Jharkhand (2021 estimates)

4. In-depth investigation of wage levels and the living wage

One important objective of the study is to understand in detail not only pay practices but also whether the total income of mica workers was covering their basic needs.

Two sets of questions were asked to reach that goal: first on wage levels and second on workers' household expenditures. The semi-directive interviews were complemented by price surveys in local markets to get an accurate estimate of the prices of basic commodities.

The combination of interviews and price survey in local markets enabled to estimate the eventual living wage gap for mica workers presented in this section. The FWN methodology is detailed in annexes.

A survey among workers to get their family's structure of consumption

Workers reported the income they individually receive from all kinds of activities (mica related or not), and reported the regular expenditures supported by the household with regards to housing, food, education, healthcare, transportation etc. According to the Fair Wage Network methodology, typical costs are then estimated thanks to a set of assumptions. For example, housing accounts for an acceptable quality of accommodation according to UN-Habitat. Food costs should cover a daily diet of 2,200-3,000 kilocalories / adult / day. Childcare, education, and healthcare are also accounted for. A last is left for leisure and / or for some precautionary savings to face potential unexpected expenditure.

A survey among local markets to get the right prices of basic goods

Two local markets were surveyed in each state, one in a rural area and one in an urban area, hence four in total.

Different vegetable & fruit vendors and essential commodity stores were covered in the market surveys as follows (see accurate list in the Annex), in each of the two states:

1. General Stores / Kirana Shops (two to three each in rural and urban areas) selling food rations, toiletries, and house-hold rations.
2. Vegetable/ fruit markets (multiple vends in rural and urban areas) mostly open-air markets where vendors display fruits / vegetables on the ground or on carts, occasionally in shops.

Assumptions to estimate the living wage of a typical household[9]

The assumptions to estimate a living wage are critical since the living wage directly depends on them. In Bihar and Jharkhand, the following assumptions were made for a typical household:

- The household is composed of two adults and three children.
- One income earner works full-time in a mica-related activity (mica picking or mica processing). Other household members than the one working in a mica related activity, are

[9] The term 'income' is used for mica pickers since they get their revenues from selling the mica they collected to intermediaries in an unformalized manner, the term 'wage' is used for workers in mica processing units since they get a regular monthly wage from their employer

working for an equivalent of 1.5 full time job in an income earning activity that is different from mica.

Living wage of a typical mica dependent household

Based on the above assumptions, on workers' interviews, and on local markets surveys, the monthly living wage for a family of two adults and three children was estimated to the below levels (Figure 9):

- 15,055 INR/month for a mica picker's family in rural Bihar,
- 14,881 INR/month for a mica picker's family in rural Jharkhand,
- 17,157 INR/month for a mica worker's family in urban Jharkhand.

The difference is mainly due to higher cost of living in urban compared to rural areas.

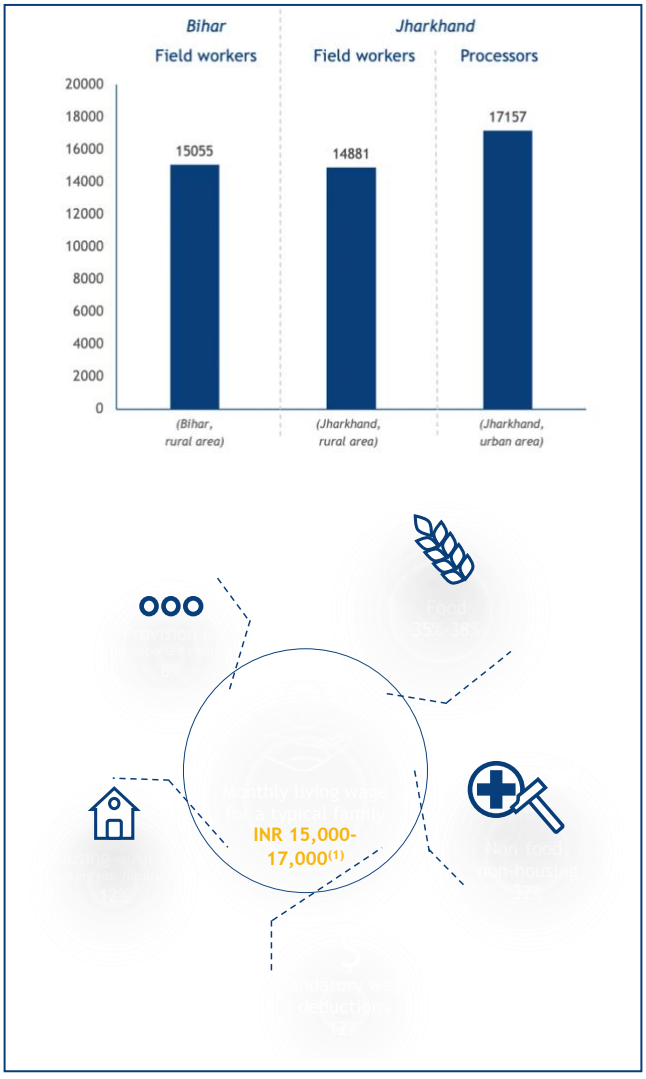

Figure 9. Living wage for mica field workers' and processors' typical families in Bihar and Jharkhand (gross, INR/month, 2021 estimates)

Current level of mica workers' wage

Based on the results of interviews, the monthly gross wage for mica workers in Bihar and Jharkhand was estimated to the levels presented in Figure 10.

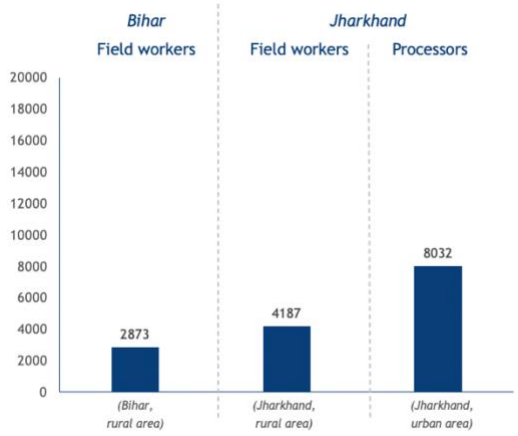

Figure 10. Average wage earned from mica activities only of individual mica field workers and processors in Bihar and Jharkhand (gross, INR/month, 2021 estimates)

Table 2 is making the distinction between the different components of mica workers' wage:

- Mica pickers do not benefit from any other bonuses nor from any overtime hours that would be paid more than the average hourly rate.
- Workers in mica processing units were found to enjoy a regular annual bonus of 2,623 INR/year (218 INR/month, averaged). Overtime is found not to be declared nor paid at a higher hourly rate.

Table 2. Components of mica field workers' and processors' wage in Bihar and Jharkhand

	Bihar, Field Workers	Jharkhand, Field Workers	Jharkhand, Processors
Gross monthly wage, excluding OT (Overtime)	NA	NA	INR 8,032.10
Net monthly wage, excluding OT	NA	NA	INR 7,294.98
Average net monthly OT income	NA	NA	NA
Annual bonus	NA	NA	INR 2,623.20
Monthly value of annual bonus	NA	NA	INR 218.60
Additional monthly allowances	NA	NA	NA
Net monthly income from mica	**INR 2,873**	**INR 4,187**	**INR 7,513**

Mica workers' wage is lower than the living wage, and even lower than the minimum legal wage

It appears that the income of workers related to mica activities is significantly lower than the living wage for a typical household (one worker involved in mica-related activities and 1.5 worker-equivalent involved in other paid activities). The gap is particularly high for mica pickers in Bihar with a monthly income related to mica activities representing only 19% of the household living wage. For mica pickers in Jharkhand, their monthly income represents 28% of the household living wage (Figure 11).

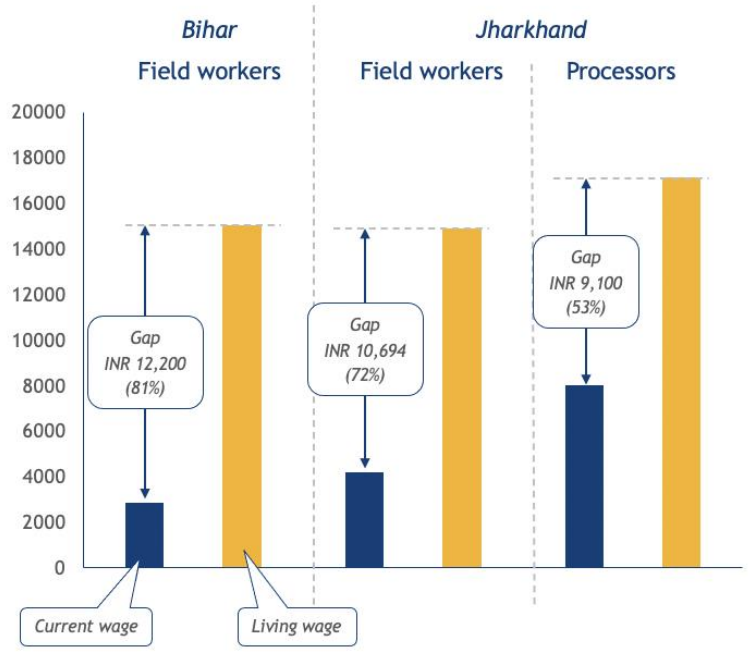

Figure 11. Monthly living wage gap for mica field workers and processors in Bihar and Jharkhand (gross, INR/month, 2021 estimates)

The situation is slightly better but still not satisfactory for workers in mica processing units since their income related to their work in processing units is also lower than the living wage and represents only 47% of the latter.

One key root cause explaining the low level of the current wage earned by mica workers is that most workers seldom logged hundred percent working days/hours during any month. Should they be paid at the legal minimum wage for unskilled workers on hourly basis, it would not be sufficient to reach the legal minimum wage on monthly basis. This assessment could unfortunately be worsened when the legal minimum wage is not even paid. At a processing unit in Koderma (Jharkhand), the lowest level of wages (mostly women) was based on prevailing industry rate and was lower than the applicable minimum wage rate for the state.

The significant living wage gap leaves mica-dependent households with insufficient resources for an individual worker to sustain the basic needs of his/her family when this worker is the only income earner of the household and involved in a mica-related activity.

The above preliminary conclusion could be completed by one observation made during the interviews: the average number of income earners in a typical household was greater than only one. And that the mica-dependent household had sometimes developed additional sources of livelihood to sustain the needs of the family.

The relative importance of these additional sources of livelihood was therefore considered (see next section).

The comparison between the average monthly wage currently received by mica workers and the minimum legal wage (unskilled worker, 8 hours a day) is presented below (Figure 12).

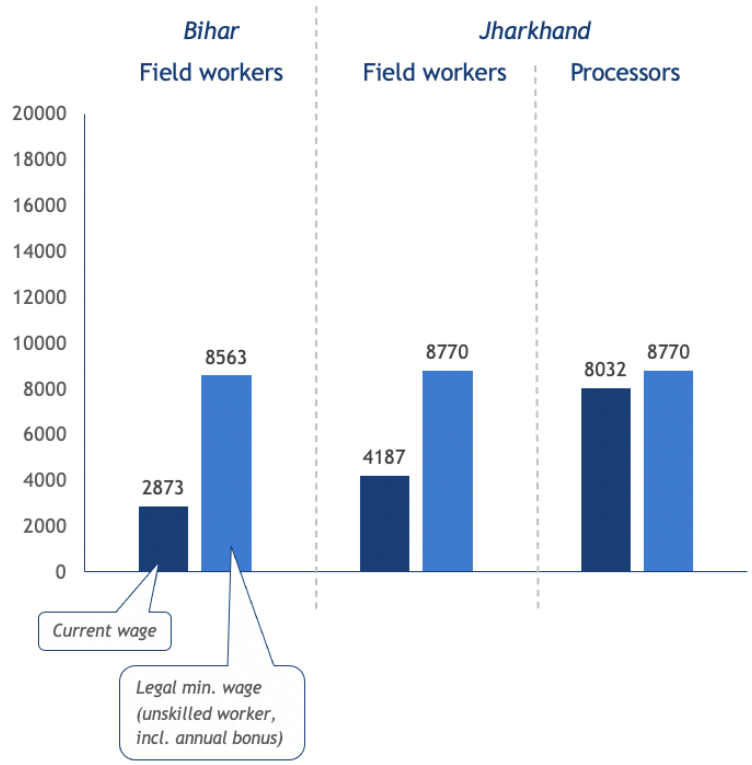

Figure 12. Comparison between current average wage and legal minimum wage for mica field workers and processors in Bihar and Jharkhand (gross, INR/month, 2021 estimates)

A key outcome is that the monthly wage currently received by interviewed mica workers, regardless of their activity and of their location, is significantly lower than the legal minimum wage for unskilled workers.

The result of the interviews interestingly shows that mica workers are not aware of the legal minimum wage: 100% of mica pickers did not know about it, when only 7.5% of mica workers in mica processing units know about it (Figure 13).

As described above, the situation appears to be slightly better for mica workers in processing units, where the average income almost reaches the minimum legal wage. One might even consider that the minimum legal wage is reached when accounting for mandatory deductions for

social security (while the minimum wage rate was INR 8,769, it is reduced to INR 7,063 after these deductions).

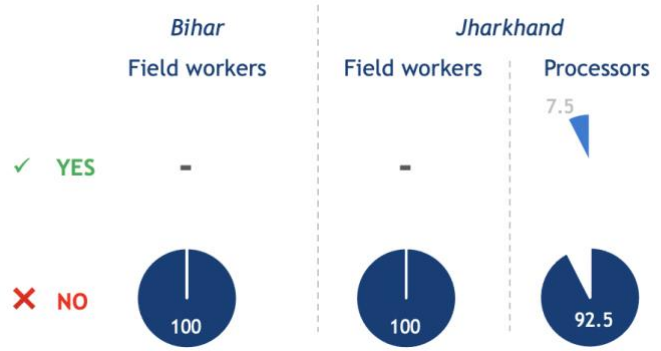

Figure 13. Answers, by the mica field workers and processors in Bihar and Jharkhand, about the question "do you know what is the legal min. wage that you should be earning?" (2021 estimates)

High-level estimate of a fair price for mica at mine / collection level

Based on the gathered data, it is possible to end up with a high-level estimate of the earnings of mica field workers by kilo of mica they collected. As well, based on the legal minimum wage and based on the estimate of the living wage, it is possible to estimate the price that would enable mica field workers to have a decent life, keeping in mind that the volume they would collect in one day would remain the same.

5. Workers' living conditions and dependency on mica activity

Though the surveys confirmed that picking and collecting mica is a main source of livelihood for the tribal villagers of Jharkhand and Bihar who are spending a significative time on this activity, mica workers reported also other complementary sources of livelihood.

Other sources of income for mica workers

Based on the information collected during the interviews, the additional sources of income were identified as follow (Figure 14):

1. Grow vegetables and staple food largely for their own consumption, leading to lower expenditures towards buying such food items,
2. Pick firewood from the forest and sell it,
3. Collect leaves from the forest and weave them into plates and bowls, and sell these manufactured products,
4. Break tender branches of "Neem" tree and cut them to even size of 6" to 7" and sell them (this serves as a substitute for toothbrush and paste),
5. Odd jobs as drivers, helpers in local shops and road-side eateries, cook, loading-unloading in nearby township,
6. Instances of self-employed tailor: repairing and stitching basic items of clothing.

It is interesting to note that all mica pickers in Bihar declared to have additional sources of livelihood, and almost all in Jharkhand (13% only had no additional sources of income). Farming is, by far, the most widespread source of income after mica picking.

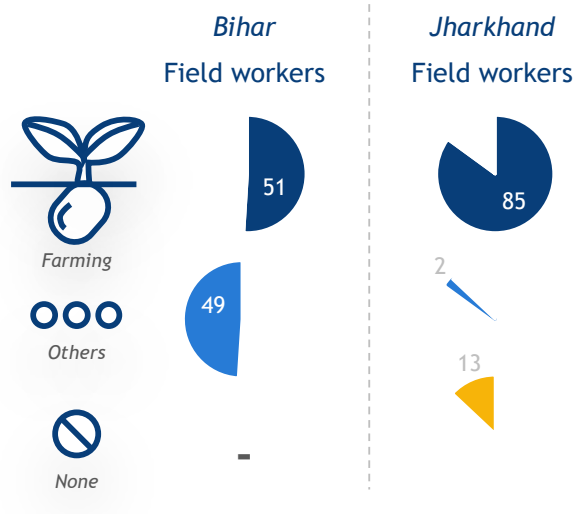

Figure 14. Other sources of income for mica field workers in Bihar and Jharkhand (2021 estimates)

These additional sources of income are unstable and of lower importance relatively to mica-related income

From the information collected during interviews, workers were on average earning 75% of their full income though mica-related activities. Plus, farming, which most of the workers are involved

in (Figure 14), is a seasonal or need-based activity and does not contribute more than an average of 25% of annual average earnings.[10]

The full income including all sources of income remains lower than the living wage

Even after the addition of other sources of livelihood to mica-related incomes, the total revenue of mica picker remains lower than the living wage (Figure 15). The total revenue of mica pickers' households in Bihar remains at 25% of the living wage (a gap of 75%). Mica pickers in Jharkhand and their family earn 38% of the living wage (a gap of 62%). Households of workers in processing units in Jharkhand, though having access to a higher level of income, earn also less than the living wage (a gap of 38%).

These low family incomes explain why most families of mica workers are living in extreme poverty situations. To be noted that nearly 13% of collectors in Jharkhand reported not to have any other source of income which signifies a 100% rate of dependency on mica activity and a total revenue remaining significantly low.

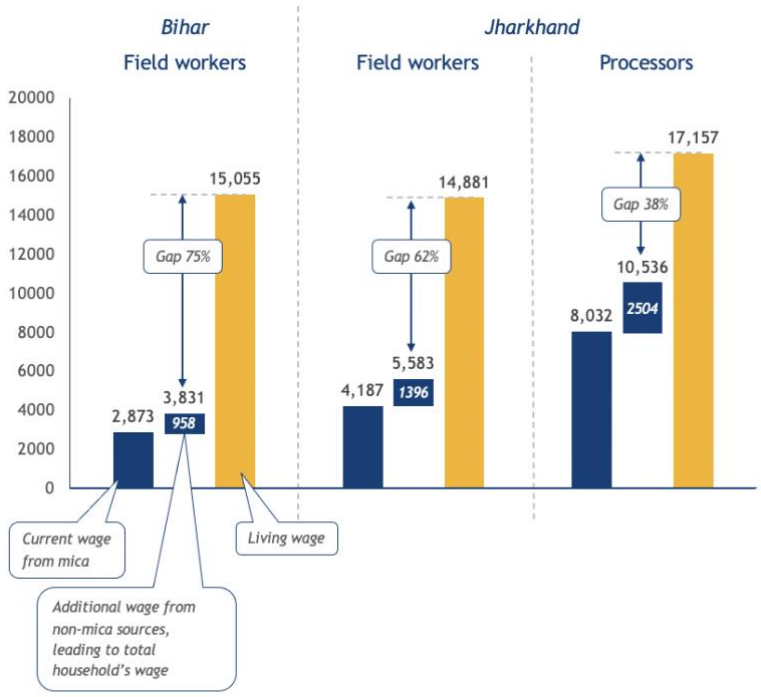

Figure 15. Total wage from mica and non-mica activities earned by the whole household, compared to the household living wage, for mica field workers and processors in Bihar and Jharkhand (gross, INR/month, 2021 estimates)

[10] This 25% was defined from the villagers' reporting, and would correspond to an over-estimate rather an under-estimate of the real income coming from non-mica activities

Families highly dependent from mica activities

40% of the interviewed workers in Jharkhand declared that more than 50% of family members (but not all) are involved in mica activity. In Bihar, 100% of the workers declared that less than 50% of members are involved (Figure 16). It is in general the spouse being involved (in 89% of cases for collectors in Bihar, and 77% of cases for collectors in Jharkhand, Figure 17Figure 16).

Nearly 5% of workers involved in mica collection in Bihar reported children also to be involved in mica activity, compared to 0% in Jharkhand (this question was answered by all workers). It shall be noted that this number might be under-estimated since some workers might have not wanted to disclose that their children were involved in mica picking.

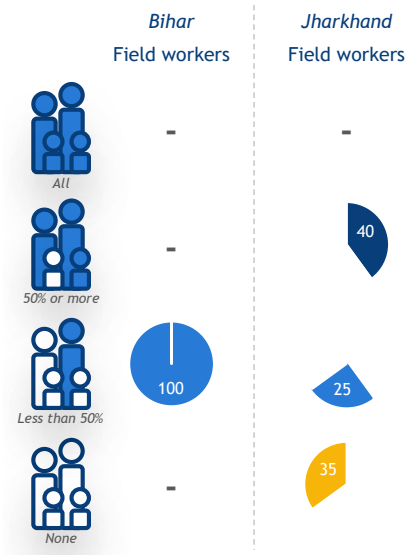

Figure 16. Share of family members involved in mica collection in Bihar and Jharkhand (2021 estimates)

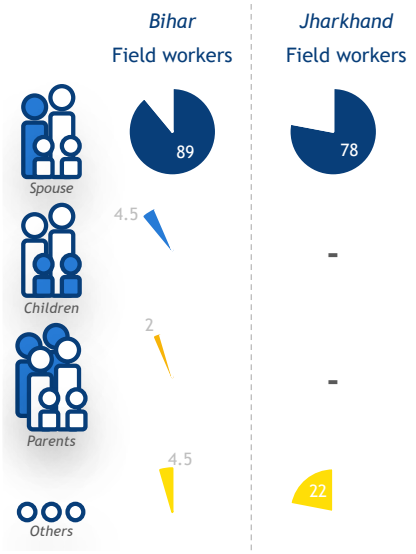

Figure 17. Other household members involved in mica collection in Bihar and Jharkhand (2021 estimates)

Difficulties to face unexpected expenditures

A set of qualitative questions was asked to better capture living conditions of workers and their household.

Unexpected expenditures are not so frequent…

20% of surveyed mica pickers in Jharkhand (9% among pickers in Bihar and 10% among mica workers in processing units in Jharkhand) reported having encountered unexpected expenditures (mostly for medical reasons) over the last six months (Figure 18).

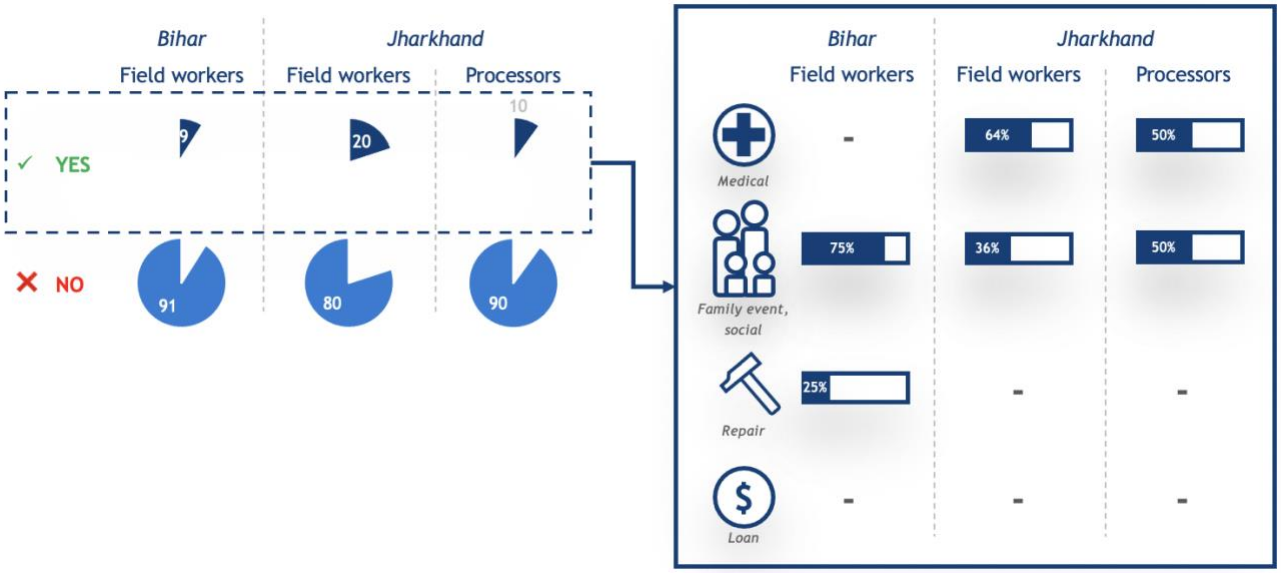

Figure 18. Share of mica workers and processors in Bihar and Jharkhand who faced an unexpected expenditure in the last 6 months, and nature of this unexpected cost (2021 estimates)

… but when they occur, most of the households struggle to cover the full amount.

Only 25% managed to fully fund these expenditures, while 75% and 100% respectively could find only part of the funds and 9% among pickers in Jharkhand could not (Figure 19).

No workers could use their own savings to do so for the only reason that they seem not to have any savings (except 9% among collectors in Jharkhand). Most workers had to rely on loans from the family or eventually from the bank (25% among processors in Jharkhand thanks to their more regular job) to face such unexpected expenditures (Figure 19).

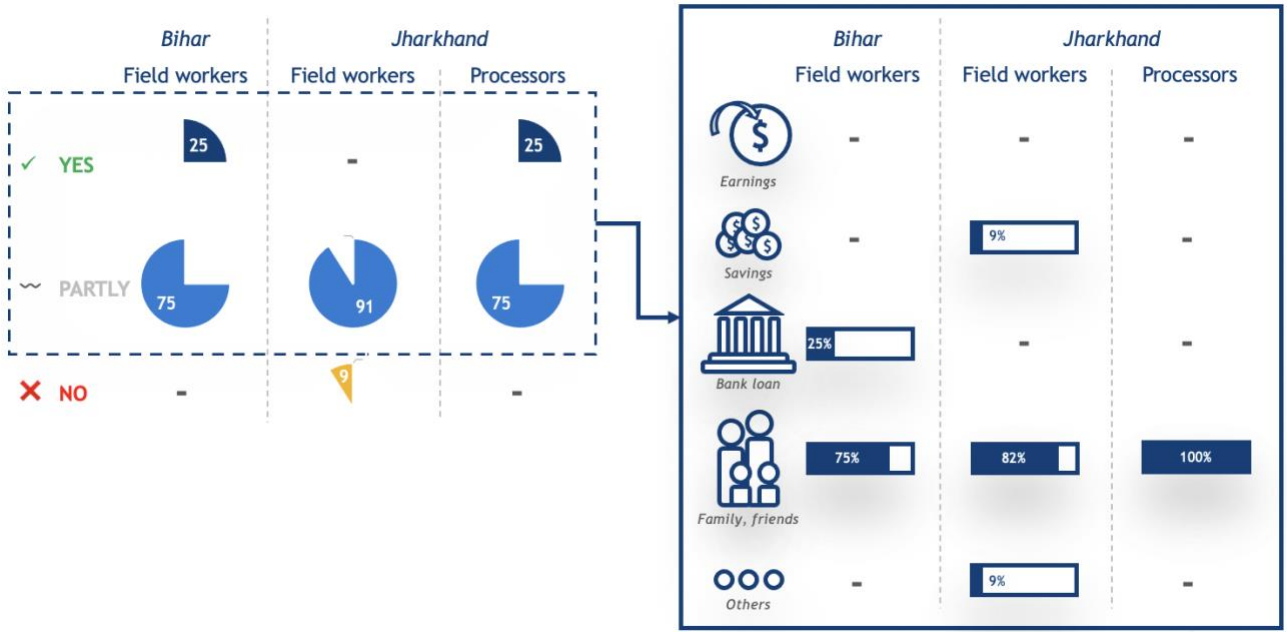

Figure 19. Ability of mica workers and processors in Bihar and Jharkhand to cover unexpected expenditures and the nature of the funds they were able to mobilize (%, 2021 estimates)

Mica pickers do not have access to social insurance/benefits, some mica workers do

As shown in Figure 20, no worker involved in collecting mica receive any social security benefits, which could seem logical considering that they are self-employed people. However, this gap might be explained too by the apparent lack of linkages between mica picking communities and government schemes.

70% of the workers in processing units receive social security benefits.

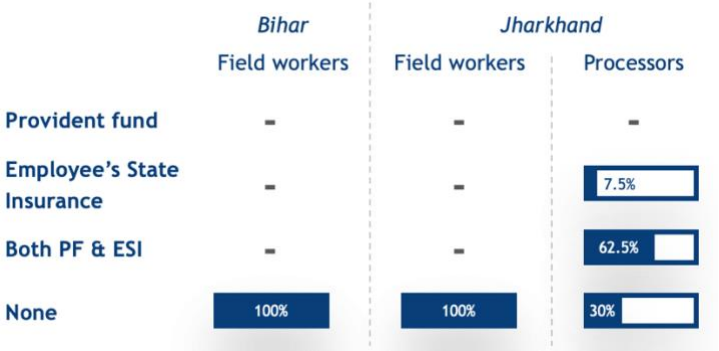

Figure 20. Share of mica field workers and processors receiving social security benefits in Bihar and Jharkhand[11] (%, 2021 estimates)

[11] These are Social Security benefits for which there are deductions from the employees' wage and contribution by employer. PF is the Provident Fund, also known as Employees Provident Fund, towards retirement benefit and accumulates interest year on year. ESI is

6. Mica workers' perceptions on redistribution

Workers' interviews but also interviews of intermediaries (transporters) enabled to better capture the root causes of low wages of mica workers, and to investigate current pricing practices and mechanisms for paying artisanal mica pickers and workers in processing units.

Mica pricing mechanisms reported by workers

When asked about their perceptions on their income and the prices of mica, workers first reported the price they get for mica they sell to intermediaries (Figure 21).

Mica price was significantly higher in Bihar than in Jharkhand. This apparent difference might partly reflect a better quality of the Bihar mica. However, according to the interviews, it rather reflects the demand / supply balance, slightly more favorable to mica pickers in Bihar.[12]

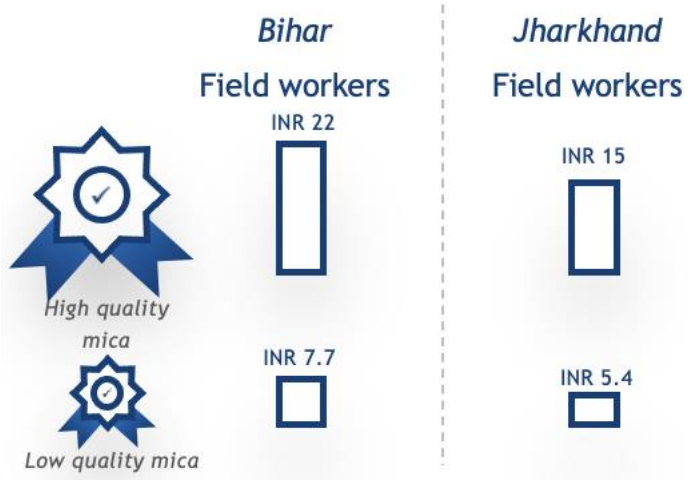

Figure 21. Average price mica field workers in Bihar and Jharkhand are selling mica, depending on quality (INR/kg, 2021 estimates)

Regarding remuneration fairness, no picker reported to receive a fair remuneration for their work (that ensure decent standards of living) while only 12% among workers in processing responded positively (Figure 22).

Interestingly, most collectors reported that the prices had gone down over the last two years while collectors in Bihar reported constant prices (Figure 23).

The feeling of a low, unfair, and not understood remuneration prevails to all pickers, both in Bihar and Jharkhand.

the Employees State Insurance, towards medical and maternity benefits. PF was not applicable in one out of the four processing units in Giridih (Jharkhand) as they had 15 workers and PF kicks in when the number of workers is at least 20. The processing unit in Koderma (Jharkhand) was neither paying Minimum Wages, nor providing the Benefit of Provident Fund & Employees State Insurance, and were thus in violation of the legal requirements

[12] Here, it could be interested to note that workers in Bihar were more vocal and their level of awareness was found to be higher, something that might be associated with better negotiation skills.

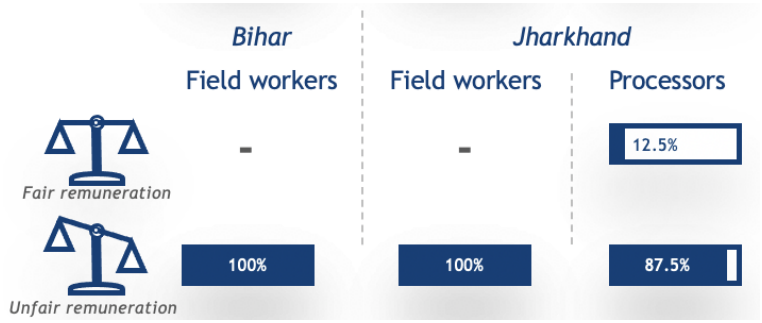

Figure 22. Share of mica field workers and processors in Bihar and Jharkhand who considered receiving a fair / unfair remuneration for their work (%, 2021 estimates)

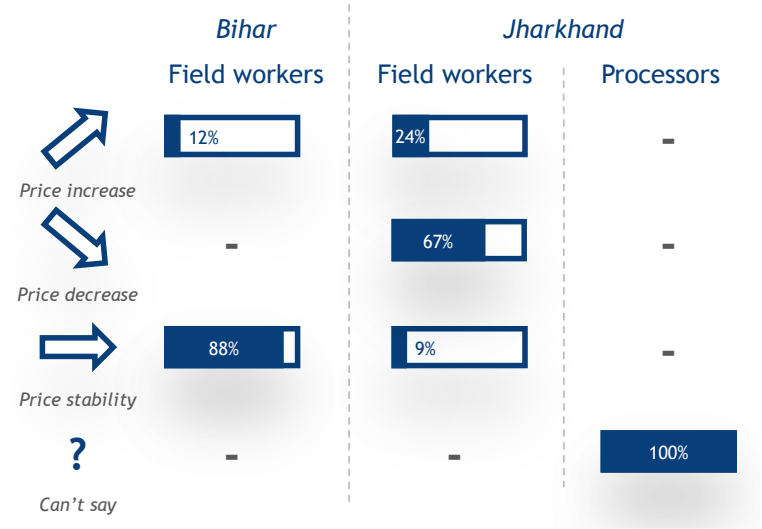

Figure 23. Share of mica field workers and processors in Bihar and Jharkhand considering price changes over the last 2 years (%, 2021 estimates)

Workers are aware of the unequal redistribution of revenues in mica industry

100% of mica workers, independently of location and activity reported an unequal income sharing of mica-related revenues

When asked about who was earning the most in the mica Industry, a majority especially in Bihar reported intermediaries and transporters. Among workers involved in processing, a majority designated exporters/retailers (Figure 24).

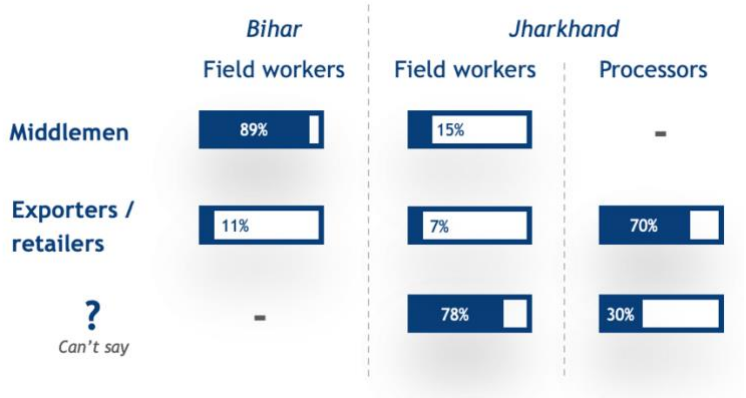

Figure 24. Actors along the supply chain considered by mica field workers and processors in Bihar and Jharkhand to earn the most in the mica industry. None of the other categories – intermediaries, brands, retailers, processors – were considered as earning the most in the mica industry (%, 2021 estimates)

7. Which root causes explaining low prices for collectors?

When asked about their position in the value chain and their bargaining power, all mica workers report a fairly low knowledge about the supply chain, as well as a low level of awareness regarding price setting mechanisms. Similarly, mica workers report to be in an unfavorable bargaining position against their counterpart (intermediaries / transporters) to which they sell mica.

Poor workers' knowledge and awareness

100% of mica workers, independently of location and activity reported not to know how prices were determined

Almost **100%** of mica workers, independently of location and activity reported **not to know which other actors are involved in the mica supply chain***

** Except for a few collectors in Jharkhand (7%)*

Similarly, workers were not aware of the different uses of mica or of the other industries that are using mica:

Almost **100%** of mica workers, independently of location and activity reported not to know the different uses of mica*

100% of mica workers, independently of location and activity reported not to know what the industries using mica are

** Except for a few collectors in Jharkhand (7%)*

Low bargaining position

100% of mica workers, independently of location and activity evaluated their **bargaining power as low**

Possible levers for better pricing

When asked about possible solutions mica workers believed could help getting a better price for collected mica, 100% of collectors in Bihar mentioned 'Selling to different actors' as the possible solution while collectors in Jharkhand identified 'Selling collectively' as a way to obtain better prices from buyers (Figure 25).

Structuring mica pickers in collective, legal and recognized entities could be a first step toward an improved bargaining power. The collective strength could support an improvement of the mica pickers' position as well when negotiating for prices.

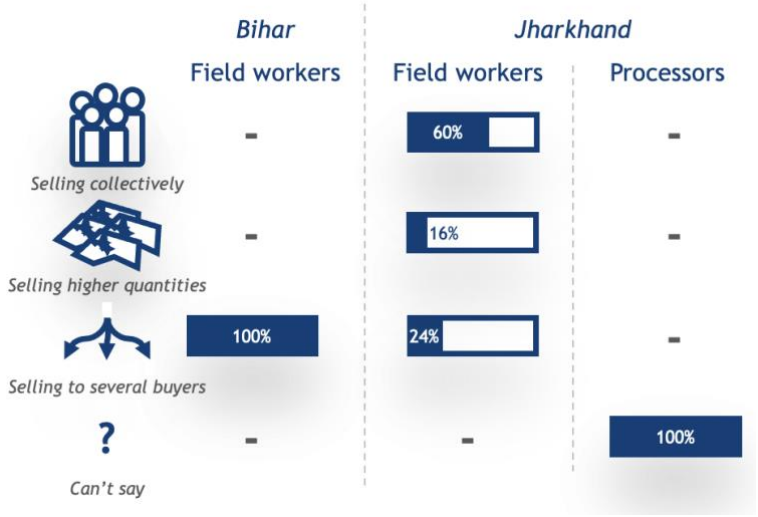

Figure 25. Factors identified by mica field workers and processors that may help them get a higher price (%, 2021 estimates)

8. Pricing and value-added redistribution: Intermediaries' point of view

To complement workers' points on pricing and redistribution in the mica supply chain, 8 intermediaries in Giridih and 4 in Koderma were interviewed (see sample of the survey in Table 3).

Description of intermediaries' activity

Intermediaries purchase mica either at the collection site or from the villages. Mica pickers sometimes hand over their day's picking at the intermediaries' premises on their way back from the sites.

Intermediaries then transport mica to the aggregators, or the aggregators have it collected from them. As an order of magnitude, multiple intermediaries around a group of villages might be considered, when only one or two aggregators are present in the region.

All transactions are cash driven, although there was an instance where pickers would barter collected mica for rice with the intermediary.

In terms of distribution of earnings:

- Mica pickers are at the lowest end of the spectrum and have the least earnings,
- The intermediaries who buy from 25 to 30 pickers, earn significantly higher revenues, based on larger quantities collected,
- The aggregators are benefiting the most as they buy from several intermediaries in bulk and have the ability to hoard and manipulate the market, which leads to a relative control on prices. The aggregators therefore extract the maximum profit from this supply cycle, often with the support of the government authorities.

No/almost no value is added along the local supply chain: mica only moves from pickers and collectors to intermediaries to aggregators. Intermediaries are sometimes segregating mica based on quality. A second level of segregation happens in processing units, where mica is transformed. Here, value is added to mica via a various set of processing steps, before being exported or sold to the domestic market.

Since the trade is considered illegal, the intermediaries also have to pay bribes to forest officials and the local police. Most intermediaries stated that if the government could legalize the picking, collection, excavation and trade of mica and lease sites to them, they would be able to do away with the aggregators and sell directly to processing units while the government could fix fair prices (that would ensure a living wage to mica workers) or wages for the pickers and collectors. The nexus between the aggregators ("stockists") and the authorities needs to be addressed.

Last but not least, since the outbreak of the pandemic, business was believed to have dropped on an average by 30%. This unfavorable current context encourages market tensions and does not help in establishing a fair price for mica nor does leave space for bargaining power improvement in the short term.

Table 3. The sample of interviewed intermediaries / transporters

	Jharkhand *(Intermediaries)*
Number of Intermediaries Surveyed	12
Average Age	44.67
Average Tenure of Current Employment in Years	7
Male to Female Ratio of Workers Surveyed	Males: 91.67% Females: 8.33%
Average Number of Family Members Providing Assistance	0.42
Percentage of Locals and Migrants amongst Intermediaries Surveyed	Locals: 100%
Percentage Distribution by Designation/ Position of Intermediaries Surveyed	Buying: 100%
Percentage Distribution by Type of Employment: Permanent/ Temporary	NA, 100% Self Employed
Percentage Distribution by Employment Category: Direct/ Contractor	NA, 100% Self Employed
Average Daily Hours Worked in Mica Handling	5.67
Average Quantity of Mica Handled Daily, in Kilograms	404.17
Average Number of Pickers/ Collectors Sourced From	25.42
Average Purchase Price of Highest Quality Mica, per Kilogram	INR 112.88
Average Purchase Price of Medium Quality Mica, per Kilogram	INR 30.45
Average Purchase Price of Lowest Quality Mica, per Kilogram	INR 8.82
Average Selling Price of Highest Quality Mica, per Kilogram	INR 128.63
Average Selling Price of Medium Quality Mica, per Kilogram	INR 39.55
Average Selling Price of Lowest Quality Mica, per Kilogram	INR 11

Intermediaries' buying and selling process

When asked about the quality of mica, the size of mica bought and sold by intermediaries, intermediaries generally confirmed workers' responses presented earlier in the report, with mica of different quality and mainly of small and eventually of medium sizes (Figure 26).

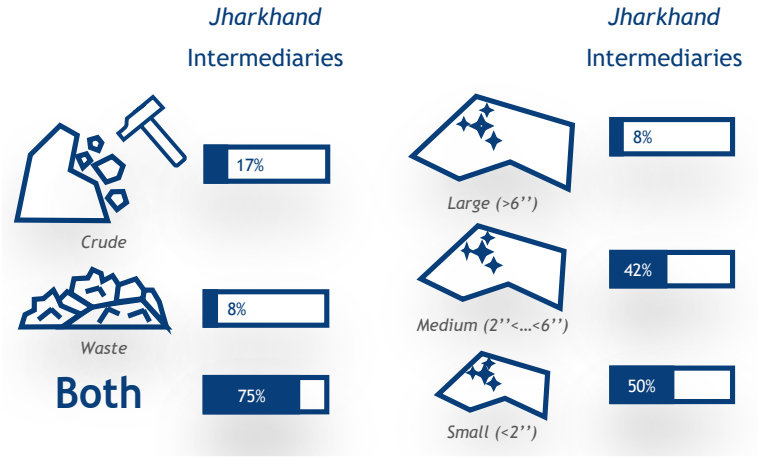

Figure 26. Quality and average size of mica collected by intermediaries interviewed in Jharkhand (%, 2021 estimates)

100% of intermediaries reported **to buy mica from individual pickers** (and neither from pickers' groups, other intermediaries, processors, buyers or retailers)

Mica is reported to be bought only from individual pickers, generally on a daily basis and without a contract immediately after individual pickers end their working day (Figure 27).

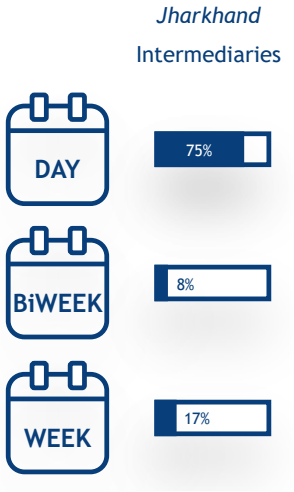

Figure 27. Frequency of mica purchases by intermediaries interviewed in Jharkhand (%, 2021 estimates)

100% of intermediaries reported **to regularly change of mica supplier**

Intermediaries do not sell to processing units directly but instead 100% of intermediaries are selling mica to aggregators, on a weekly, fortnightly, or monthly basis (Figure 28). 75% of them report not to sell to the same buyer while 25% generally sell to the same buyer (Figure 29).

The dependency to one buyer could be considered as a binding constraint hindering price negotiation and confirms the high bargaining power aggregators have on the rest of the actors.

100% of intermediaries reported **not to sell mica directly to processors but to aggregators**

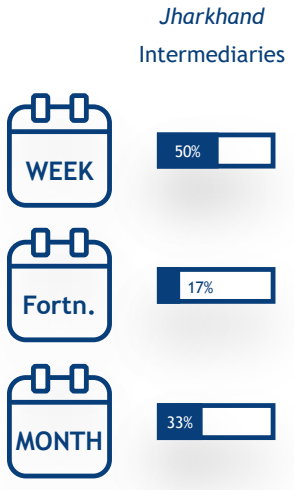

Figure 28. Frequency of mica sales by intermediaries interviewed in Jharkhand (%, 2021 estimates)

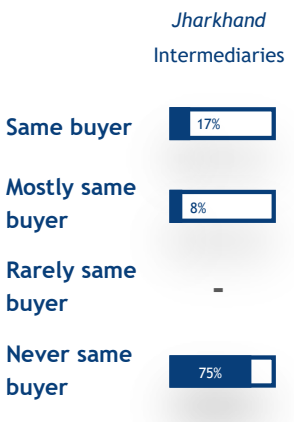

Figure 29. Intermediaries interviewed in Jharkhand answering to the question " do you sell mica to the same buyer?" (%, 2021 estimates)

Intermediaries' perceptions on internal value-added redistribution

100% of intermediaries reported **an unequal income sharing in the mica industry**

Workers' perceptions of unequal redistribution of value added within mica supply chain was confirmed by all interviewed intermediaries.

To the question on the actors getting the highest share of the pie, 55% reported processing units, and 45% reported intermediaries, that is the aggregators to which they sell (Figure 30).

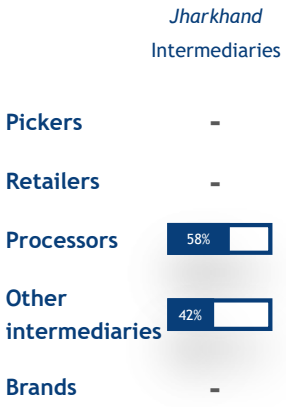

Figure 30. Actors who are getting the highest share of the pie, according to the intermediaries interviewed in Jharkhand (%, 2021 estimates)

Intermediaries' limited awareness of the supply chain

Only **17%** of intermediaries reported to **know the different uses of mica and the industries using mica**

Interviews' results also revealed a limited knowledge of intermediaries of mica supply chain in terms of use (only 17% of them were aware of the different uses of mica) and different actors/industries (also 17%) behind mica activities.

But being aware of price determination mechanisms

At the same time, most of intermediaries (67%) reported to be aware of price determination of mica.[13] They generally consider market prices as the main factor for the buying/selling price and the quality of mica (Figure 31).

[13] Some intermediaries were not comfortable discussing about price determination and did not answer to the questions.

As other drivers of the buying price, intermediaries retained the profile of the seller. Intermediaries also reported to change selling prices according to buyers but along slight variations only (Figure 31).

25% of intermediaries reported **the need to have government's support and initiative in the mica industry**

While most intermediaries could not say what improvements would be needed, 25% reported the need to have government's support and initiatives in this industry.

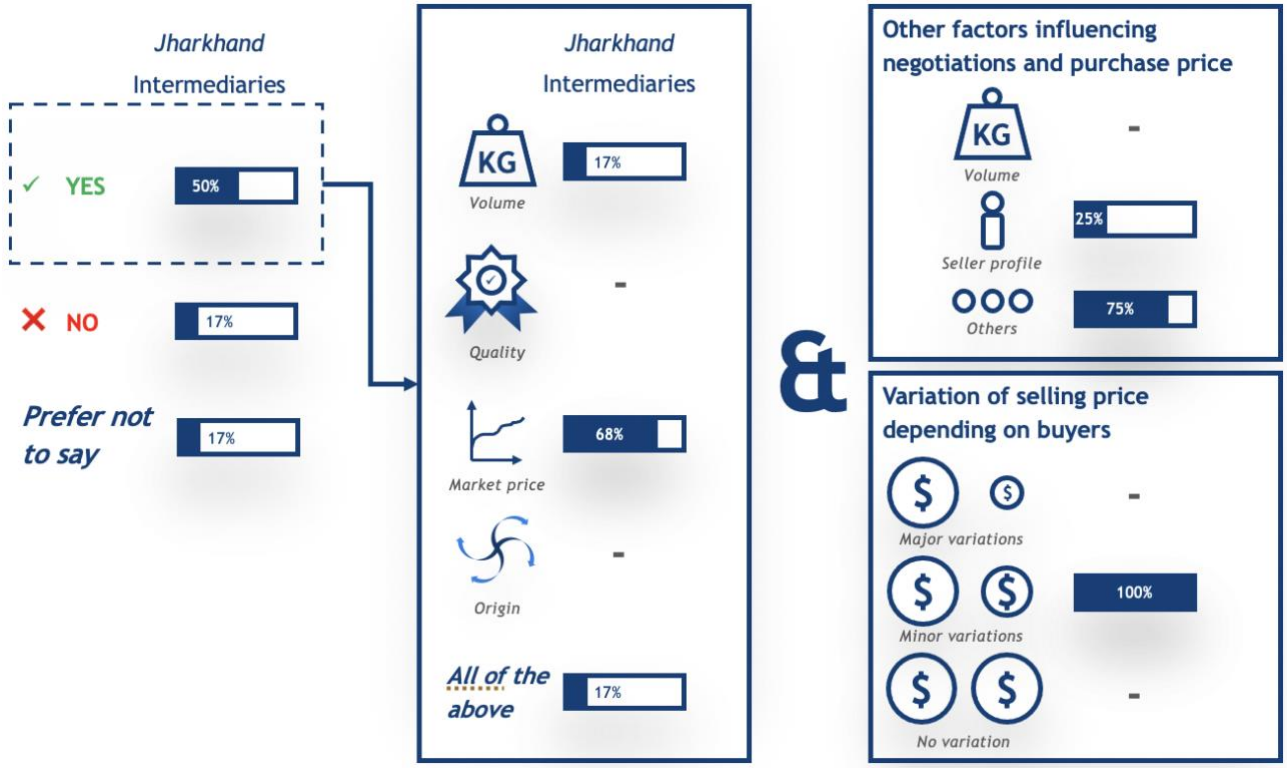

Figure 31. Share of intermediaries interviewed in Jharkhand who declared knowing about mica price determination mechanism, and which main factors are used in determining their own buying and selling prices, as well as other factors influencing negotiations, and purchase and selling price (2021 estimates)

Intermediaries' negotiation power and place in the chain

100% of intermediaries evaluated their **bargaining power as low**

Overall intermediaries evaluated their bargaining as rather 'low'.

Government incentives was retained as the main levers that could help them in their trading activity while the rest highlighted the need to shift their activity towards higher quality of mica (Figure 32).

Overall, a majority reported profits did not change while the remaining intermediaries were equally split between those who experienced increasing profits and others who suffered from declining profits (Figure 33).

Their final evaluation of mica supply chain as our last question was rather bitter, with 83% of them reporting that the mica supply chain was dominated by a few actors, while 8% highlighted again disbalanced negotiations, and 8% reported the need to have a shorter chain, with less intermediaries taking their margin (Figure 34).

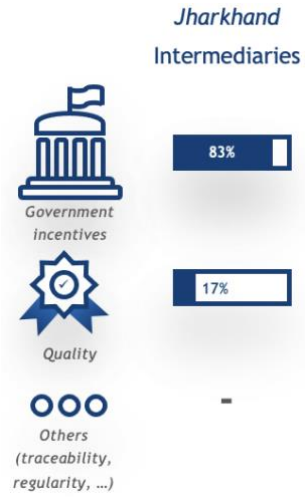

Figure 32. Main levers identified by intermediaries in Jharkhand that would help improve their negotiation power (2021 estimates)

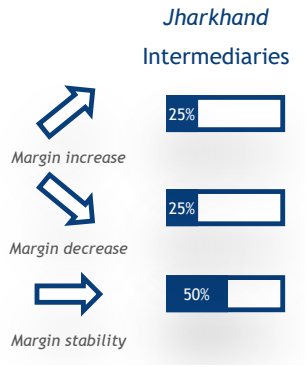

Figure 33. Evolution of the profit margin of intermediaries interviewed in Jharkhand, according to them, over the last two years (2021 estimates)

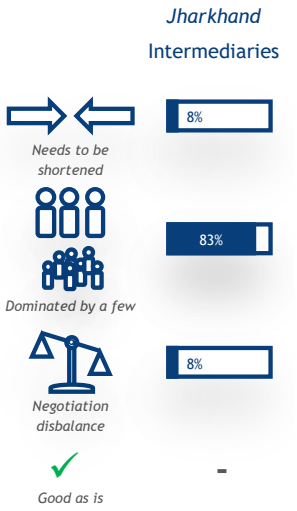

Figure 34. Intermediaries view on the mica supply chain, as it is currently structured (2021 estimates)

Conclusions and policy perspectives

Thanks to a series of interviews and surveys carried out in the mica belt in Bihar and Jharkhand, the living wage of a typical worker's family in the mica industry was estimated. The living wage, the minimum wage that workers and their family should receive to cover their entire family basic needs, was estimated for typical workers in three areas of the mica belt:

- 15,055 INR/month for a mica picker's typical family of two adults and three children in rural Bihar,
- 14,881 INR/month for a mica picker's typical family of two adults and three children in rural Jharkhand,
- 17,157 INR/month for a mica worker's typical family of two adults and three children in urban Jharkhand.

The comparison of the living wage with the revenue actually received by the mica workers and their family depicts a situation far from rosy for mica-dependent households. Although mica activities do not represent the only source of income for workers' households that also relies on other activities like farming, they represent up to 75% of total household income.

All revenues considered (mica and non-mica), current wage is significantly lower than the living wage: the gap reaches 62% to 75% for mica pickers' families respectively in Jharkhand and Bihar, and 38% for mica workers' families in processing units in Jharkhand. The current wage of individual mica workers in all areas appears to be even lower than the legal minimum wage.

On top of lacking resources to meet their current basic needs, mica workers in rural areas don't benefit from a stable and secured source of income nor from social security benefits. In urban areas, mica workers in processing units benefit from a more regular income and receive social benefits. Mica workers reported to live in a difficult situation where facing unexpected expenditures might put the household in extreme poverty. Savings are a luxury that only few can afford.

Mica pricing mechanisms and the internal redistribution process within mica supply chain was also evaluated to better understand the root causes explaining the low level of mica workers' wages. As reported by all actors from mica pickers to processors passing by intermediaries, the balance of power along the upstream mica supply chain is uneven: a few actors – aggregators and intermediaries – are placed in a dominant position compared to others, and mainly mica pickers. Price setting mechanism seems to be controlled by those who detain cash. The aggregators seem to have the ultimate control on price making mechanism and rule over intermediaries. The intermediaries in turn, financially stronger than mica pickers, rule over them. At the extreme upstream of the supply chain, mica pickers have almost no bargaining power as they need money for subsistence.

Aggravating factors such as the lack of information/awareness of mica workers, and the lack of legal regulations leading to a blur market space dominated by political influences and corruption (between officials and aggregators for instance), finalize the picture.

To cope with the rather gloomy perspective that came out of the surveys and interviews, concrete areas for improvement and related actions were identified:

- The development of a clear legal framework and its enforcement is a key prerequisite on the path toward the improvement of wage and working conditions of mica workers. In such regulation, one could imagine that a minimum price for mica would be set up, that a minimum wage would be set up for mica picker, depending on their ability to excavate, collect, and pick mica over a given duration. Pricing mechanisms could be modeled on other supply chain example, like the tea plantations: a fixed daily wage would be paid when a bag of a certain weight (for example 20 kg) is collected and checked. An additional incentive for every extra kg is paid thereafter. Deductions in weight, if any (for impurities, moisture etc.) should be scientifically defined and properly communicated to mica pickers. Another option could be to pay mica pickers based on the minimum daily wage (defined in the law for 8 hours of work in a day), independently of the weight of collected mica. Overtime beyond this would be compensated at a premium rate.
  In any case, regulations should ensure a minimum price control to avoid underpaid mica to pickers.
- In order to guarantee the protection of the health and safety of mica pickers, transportation means could also be made available for mica pickers who travel long distances from home to mining sites. The location of collection centers needs to be thought through, so the mica pickers/collectors do not have to carry back heavy bags manually. The provision of PPEs would be required to mica pickers, and training or awareness raising campaigns should be set up so that mica pickers are aware of health and safety risks and ways to be protected against them.
- Empowering mica-dependent households to come out of the poverty situation they are living in is a key prerequisite to eradicate child labor. As part of this empowerment, the payment of a living wage would contribute to enable households to cover their basic needs without requiring to the additional revenue coming from the children's work. On top of ensuring the payment of a living wage, awareness raising on the importance of education, access to a quality education for all children and linkage with the government services mica pickers are eligible to are a few contributions to the systematic change that is required in the mica belt to eradicate child labor.
- The global level of knowledge and awareness of mica pickers and mica workers in processing units should be addressed, through trainings or dedicated sessions. They should be trained on price determination mechanisms.
- Finally, the set-up of collective organizations of pickers and/or workers would contribute to improve their bargaining power upstream of the mica supply chain. Increased mica quantity to sell would be leveraged when negotiating with intermediaries.

Working conditions and pricing mechanisms are the two sides of the same coin. Tangible progress toward a fair distribution of wealth within the mica supply chain will not be possible without improvements on those two fronts. Efforts and commitments of all possible actors are required: from the civil society to the government, passing by the private sector, including brands and retailers as major actors in this process.

Annex: Note on the FWN living wage methodology

- The living wage is defined by the FWN as a level of income that allows an individual worker to meet his/her basic needs and those of his/her family, at decent standards.
- The list of goods and services in the basket retained for the calculations of the living wage reflects this objective and includes all necessary and basic areas of expenditure of a worker and his/her family, and in particular:
    - Housing (with an acceptable quality of accommodation – according to UN-Habitat, UN criteria),
    - Food (also should be enough to ensure 2,200-3,000 kilocalories/adult/day),
    - Childcare,
    - Education,
    - Healthcare,
    - A percentage is left for leisure and for precautionary savings to face unexpected expenditure.

The surveys for this project were undertaken in mica pickers' villages and at the processing units wherein each worker was individually asked about his/her monthly earnings, work experience and expenditure. Details on expenses are presented in the following table, in percentages[14]:

Item	Bihar	Jharkhand
Household Expenses		
Rent	0%	0%
Electricity	3.3%	2.4%
Cooking Gas	6.1%	7.7%
Water	0%	0%
Internet	0%	0%
DTH TV	0%	0%
Furniture & Soft Furnishings	2.2%	2.9%
Repairs & Maintenance	1.1%	2%
Consumables/ Groceries *(Grains, Pulses, Lentils, Vegetables, Fruits, Cooking Oil & Butter, Dairy Products, Non-vegetarian Products, Salt, Sugar, Herbs & Spices, Tea & Coffee)*	38.4%	34.7%
Toiletries *(Bathing & Handwash Soap, Shampoo, Dental Care, Personal Hygiene & Sanitary Items)*	3.2%	3.5%
Household Rations *(Detergent, Dishwash, Floor Disinfectant, Floor Mop & Broom)*	1.8%	2.5%
Miscellaneous	1.1%	1.9%
Expenses on Self & Family		
Mobile Phone	2.6%	1.7%
Travel & Transport	3.3%	3.9%
Clothing	4.4%	4.6%
Medication & Healthcare	3.3%	4.3%
Education	3.9%	4.8%
Yearly Vacation/Visiting Hometown	2.5%	2.2%
Entertainment *(Fairs, Movies, Dining out, etc.)*	3.5%	1.5%
Additional precautionary savings to face unexpected expenditure	8%	8%
Mandatory wage deductions	12%	12%

[14] Totals may not be exactly 100% due to rounding

Furthermore, such expenditure data were complemented by the FWN team conducting market surveys in the nearby market areas to confirm that the information obtained was accurate. In each state, the following sites were visited:

- General Stores/Kirana Shops (two to three each in rural and urban areas) selling food rations, toiletries, and house-hold rations.
- Vegetable/Fruit market (multiple vends in rural and urban areas). These are mostly open-air markets where vendors display fruits/vegetables on the ground or on carts, occasionally in shops.

The additional following considerations were also accounted for:

- Rations including wheat, rice and sugar obtained from government shops at subsidized prices, based on quota sanctioned as per family ration card, where applicable.
- Home grown vegetables, where applicable.
- Seasonal income from part time occupations where applicable, some of these included:
    - Pick firewood from the forest and sell,
    - Collect leaves from the forest and weave them into plates and bowls and sell,
    - Break tender branches of "Neem" tree and cut them to even size of 6" to 7" and sell (serves as substitute for toothbrush and paste). Discarded after each use,
    - Odd jobs as driver, helpers in local shops and road-side eateries, cook, loading-unloading in nearby township,
    - Instances of self-employed tailor: repairing and stitching basic items of clothing).

These were mainly seasonal, part-time, or need-based activities and were found to contribute to an average of 25% of annual average earnings.

The mica value chain from India to the world

A model for sustainability analysis

January 2023

RESPONSIBLE MICA INITIATIVE

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.

http://www.responsible-mica-initiative.com

About BASIC

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.

http://www.lebasic.com

Letter of endorsement

When the Responsible Mica Initiative approached us a few months ago with both the strong and undeniable belief that “paying adults-mica-pickers a living income would have a positive impact on reducing child labour,” as well as the innovative idea of demonstrating that paying this living income would be economically viable for the entire mica supply chain, we could not help but be willing to contribute. This demonstration had already great chances to remove barriers to change.

We are proud to have contributed to this long-running study throughout the last twelve months until its successful completion, by joining our complementary expertise (see list below), and to publish its results today. It was a unique exercise that brought together several industries that use mica across the value chain, and which also fed our current respective work. As a result, we are delighted to share this outstanding result: paying a living income to upstream mica adult-workers, allowing them to raise their standard of living, and support their families without relying on their children's work, will have an infinitesimal impact on the final cost of a lipstick, a paint, or a car!

We are conscious that the concrete implementation of this living income, within long and complex value chains, is a journey, but with the commitment of all, it is certainly achievable! Our deepest wish is that all the actors within or related to the mica supply chains take ownership of these findings and start actively looking for concrete and collective solutions, since it does make sense, both economically as well as in terms of child labor and poverty reduction!

Signatories

Rosanna TUFO, Levin Sources
Antoine RAMSPACHER, RAMS & Co
Fabiana DI LORENZO, Responsible Business Alliance
Natalia URIBE, Alliance for Responsible Mining

Executive Summary

Mica, a naturally occurring mineral with outstanding electrical, heat and visual properties, is ubiquitous as an ingredient in certain industries, such as paints, cosmetics, and the automotive industry. Among others, mica comes in “sheet” form dug out from the ground, or in “scrap” form collected from mine shaft debris; in either case, mica is a valuable commodity on which hundreds of thousands of miners and pickers worldwide depend for their income. Child labour is a complex problem associated with low incomes that plagues the mica industry. The object of this study is to explore what would change along the value chain if mica pickers – people handling scrap mica in India – were paid a living income for their work, in a bid to eradicate child labour in this industry. The geographical perimeter is the world’s largest small-scale artisanal mica picking ecosystem: Bihar and Jharkhand states in India.

This study, conducted by BASIC for the Responsible Mica Initiative (RMI), explores the scrap mica value chain qualitatively and quantitatively, as a prelude to an analysis of scenarios for change. The value chain is analysed qualitatively in the sense that extensive interviews and bibliographical research were leveraged to build a model of the structure of the value chain for scrap mica: who does what, where, producing what intermediate and final products. The value chain is analysed quantitatively in the sense that prices, costs, taxes, and margins were assigned to each of the items in the structure of the value chain. These two processes, articulated jointly, made it possible for BASIC to construct an online model of the scrap value chain in Bihar and Jharkhand as it currently stands, to see where and by whom value is added to products all along the chain – from scrap mica picker to final consumer of paints, cosmetics, or cars (excluding electric components). The model is hosted on a platform on BASIC’s website (http://micavaluechain.lebasic.com/).

The current state of the value chain shows that there is considerable accrual of value downstream of India, in the middle and end of the chain. This can be illustrated by looking at the distribution of value for eight finished products that BASIC and RMI jointly decided to: DIY anti-corrosion paint, DIY architectural paint interior/exterior, OEM refinish paint, nail enamel, eyeshadow, lipstick, thermal car, and electric car. For each of these finished products, the India-based scrap mica segment of the chain represents negligible value addition: the stage from picking to export captures less than 1% of the price of final products in all cases.

Child labour is not the only problem facing the Indian scrap mica business. Mica pickers are paid far less than a living income, as are (to a lesser extent) workers in factories where scrap mica undergoes primary processing. Families live hand-to-mouth and many are indebted to loan sharks; their low caste/social status makes them especially vulnerable. Mica miners work in dangerous conditions, usually without Personal Protective Equipment (PPE), and are thereby fully exposed to the health hazards associated with their work. Most importantly perhaps, the scrap mica value chain has historically been mostly illegal (since implementation of the Forest Conservation Act of 1980). Mica workers and pickers are therefore in a precarious situation and generally have little leverage or bargaining power over dealers to whom they sell their wares, and dealers who purchase mica from pickers must lower their buying prices to prepare for unaccounted-for administrative costs. Illegality also means that the State has little control over who does what and where except through raids/inspections, and barely receives taxes on mica-related activities.

It is in light of the above considerations that RMI and BASIC built on the "status quo" model to study what would happen if mica pickers and factory workers in India were paid a living income. A series of scenarios were imagined, in increasing order of ambition in terms of social change:

- Scenario 1: Mica picking is legalised through auctions on *dhibra* dumps, and mica pickers and factory workers receive minimum wage or the equivalent income
- Scenario 2: Mica picking is legalised through auctions on *dhibra* dumps, and mica pickers and factory workers receive a living income/wage
- Scenario 3: Mica picking is legalised, and mica pickers organise into cooperatives of about 500 workers/10-12 villages each, and sell their mica to the Jharkhand State Mineral Development Corporation (JSMDC), which auctions it off. Mica pickers and factory workers receive a living income/wage

It is worth noting that Scenario 3 appears to be the one towards which the authorities in Jharkhand are orienting their efforts. Scenario 1 resembles more what has been done in the past: auctioning off specific sites of mica production through auctions, usually attracting bids from aggregators or processors (though extra provisions are made in our model of scenario 1 for PPE). Scenario 2 is a hypothetical "what if" of the same setup as Scenario 1 but with pickers and workers paid a living income.

Thanks to the qualitative/quantitative model built by BASIC on the basis of interviews and bibliographical research, it was possible to explore price transmission down the chain from the mine to final consumer. For each of the scenarios, the values in the model were adjusted to reflect each scenario's parameters: who does what, where, producing which finished or semi-finished products, at what price, with what costs, taxes, and margins. Price increases were transmitted down the chain with identical margins. The key finding of this exercise is that **when prices are modelled to reflect a minimum wage equivalent or a living income for mica pickers and workers, or a remodelling of the supply chain with formalisation under cooperatives, the impact on the price of intermediate products and finished retail products is negligible.** In relative terms, the additional cost at the retail stage is in most cases less than 0.1% of the per-kg price.

As for revenues to the State, we estimate that the State of Jharkhand stands to benefit from tax revenues thanks to legalisation. In a situation like scenario 3, where mica pickers organise into cooperatives and the JSMDC purchases and then auctions this mica at a living-income equivalent, total proceeds to the State from taxes on the scrap mica sector are estimated at 1,105,076,068.66 INR per annum, i.e., approximately 13.350 million USD.

The study concludes that although ending child labour in the mica value chain is a complex journey, providing a living income for mica pickers and factory workers is a first, necessary and achievable condition for reaching this goal that only requires a negligible but collective effort of all actors along the value chain. The scenarios explored in this study are improvements on the current situation because they ameliorate incomes and working conditions for mica pickers and factory workers. The model that is a companion to this report suggests that if they are accompanied with sufficient will from both political and economic actors, these scenarios could see the light of day, endowing the mica value chain with the sustainability and respect for human rights that its stakeholders wish to attain.

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Abbreviations

BGS	British Geological Survey
CINI	Child In Need Institute
DCC	District-level Collection Centre
DIY	Do It Yourself
EV	Electric Vehicle
FOB	Free On Board
IBM	Indian Bureau of Mines
JSMDC	Jharkhand State Mineral Development Corporation
OEM	Original Equipment Manufacturer
PPE	Personal Protective Equipment
RMI	Responsible Mica Initiative
TMR	Transparency Market Research
USGS	United States Geological Survey
VCC	Village-level Collection Centre

Glossary

Bihar Mica Belt/Mica Belt. The Bihar Mica Belt is the name given to a geological complex rich in mica, situated in forested and non- forested regions found in the north of the modern-day Indian state of Jharkhand and the south of the neighbouring state of Bihar.[1] The Bihar Mica Belt was so-named when Jharkhand and Bihar were a single state called Bihar, before Jharkhand split off from Bihar state in the year 2000. As a result, while the name "Bihar Mica Belt" continues to be used in academic publications, in common parlance it is common for people to refer to the "Mica Belt," without the word Bihar, given that substantial surfaces of the Belt stretch into Jharkhand.[2] The Bihar Mica Belt is where the vast majority of Indian mica is mined and picked.[3]

Block mica. Block mica is part of the sheet mica value chain. It refers to mica that is dressed from book-like blocks of mica, "with a minimum thickness of 7 mil (0.18 mm)" of relatively large size: at minimum 1 square inch (6.45 cm^2) but "up to 12" to 14" (30 to 35 cm) square."[4] Block mica is one of the bases for *Fabricated mica*.

Built-up mica. See *Micanite.*

Calcination. Calcination entails heating a raw material (here, mica) to very high temperatures, around 850 to 900°C. The impact of calcination is to remove the water content in mica, which is initially at around 4.5%.[5] The operation also gives the mica a golden lustre and may remove heavy metals and toxic substances, and improves yields.[6] Calcined mica is easier to delaminate (to separate the various sheets), and thus calcination is one of the first steps in the transformation of mica powder into a substrate for pearlescent pigments. After being rehydrated in the industrial process for making pigments, mica flakes may be calcined a second time to fix the pigment coatings such as titanium dioxide or iron oxides.[7] Calcined mica is also sought-after for its improved electrical properties. Not all mica is suitable for calcination; high temperature resistance is required.

Dhibra. *Dhibra* is the Hindi word for dumps of mica scrap. It is a neologism derived from the English word "debris."

Fabricated mica. Fabricated mica refers to sheet mica that has been mechanically transformed to make semi-finished mica products, such as washers, disks, furnace windows, strainers, condenser plates… This is achieved by "cutting, stamping and punching of natural sheet mica to specified size, shape, thickness and design."[8]

FOB (Free On Board). Free on Board (FOB) is "a shipment term that defines the point in the supply chain when a buyer or seller becomes liable for the goods being transported. It indicates when the

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[1] Hazarika, Pranjit, Dewashish Upadhyay, and Kamal Lochan Pruseth. "Episodic Tourmaline Growth and Re-Equilibration in Mica Pegmatite from the Bihar Mica Belt, India: Major- and Trace-Element Variations under Pegmatitic and Hydrothermal Conditions." Geological Magazine 154, no. 1 (January 2017): 68–86. https://doi.org/10.1017/S0016756815000916.

[2] BASIC Interview with mica sector expert, 18 November 2022

[3] BASIC Interview with mica sector expert, 1 April 2022

[4] Sitaram Group, "Processed Mica," 2020. https://www.sitaramgroup.co.in/processed-mica.html.

[5] CDMICA, "Calcined Mica Tape," 2018, http://cdmica.com/en/209/272.html

[6] BASIC Interview with mica sector experts, 9 February 2022 and 4 April 2022

[7] BASIC Interview with mica sector experts, 9 March 2022 and 2 May 2022

[8] MICAMAFCO. "Fabricated Mica," 2011. http://www.micaworld.in/fabricatedmica.html.

ownership of goods transfers from seller to buyer, and who is liable for goods damaged or destroyed during shipping."[9] A FOB dollar value, for instance in customs declarations, indicates the price paid by the buyer to the seller when the goods are loaded onto the means of transport (ship, for instance).

Mica board. Mica board is a semi-finished mica-based product made from mica paper impregnated with resins and pressed together at high temperatures. It has excellent electrical and thermal insulation properties and is sought out, among other uses, for electric vehicle batteries.

Mica films. Mica films are part of the sheet mica value chain: the term refers to sheets obtained from dressing mica books to a thickness of 0.0012 to 0.004 inches.[10] Mica films are typically used as a dielectric capacitor; the quality of the mica determines if the mica is used to make capacitors for calibration standards, transmitting capacitors, or receiving capacitors.[11]

Mica flakes. Mica flakes is "mica scrap grinded into sizes ranging from 2 mesh to 30 mesh. Natural mica flakes are prepared by a rotary hammer crushing machine."[12] Mica flakes are used as the primary ingredient in *Mica paper*, but they are also used as the basis for *Mica powder*.

Micanite. Micanite, or built-up mica, is the name given to sheet material which is made up of fine mica lamellae, called "splittings", bonded together by a variety of bonding agents in order to obtain particular characteristics for specific uses.[13] Micanite can be found in numerous forms, including sheets and tubes. Micanite/built-up mica is also the name given to materials made from mica paper pressed with resins at high temperatures, which have functional properties like those of micanite made from mica splittings. Micanite is sometimes made with a substrate such as glass fibre cloth, mat polyester, polyethylene, or ceramic felt.[14]

Mica paper. Mica paper is a semi-finished mica product that is part of the scrap mica value chain. It is made from crushed mica scrap or mica flakes, which are hydrolysed and then "deposited as a continuous mat which is then dried."[15] Inorganic or organic binders may be added. The result is a flexible material that resembles paper endowed with all of mica's desirable properties. Mica paper can be further processed to make *Micanite*.

Mica powder. Mica powder, part of the scrap mica value chain, is mica ground to any number of mesh sizes, ranging from ultra-coarse (10 mesh/1.68 mm) to ultra-fine (400 mesh/0.037 mm). There are different ways to grind mica powder from mica flakes or high-quality scrap: it is customary to distinguish between dry grinding, wet grinding, and micronisation, although the term "micronised mica" is sometimes applied to any mica sufficiently small (diameter less than 45 µm, i.e. 325 mesh and above) irrespective of how it is ground. Mica powder is the basis for an enormous part of the scrap mica value chain, with applications ranging including paints and pigments, plastics, automotive

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[9] Investopedia, "Free on Board (FOB) Explained: Who's Liable for What in Shipping?," September 14, 2022. https://www.investopedia.com/terms/f/fob.asp

[10] Kogel, Jessica, *Industrial minerals and rocks: Commodities, markets, and uses, 7th ed.,* Littleton, Colorado: Society for Mining, Metallurgy, and Exploration (U.S.), 2006

[11] United States Geological Survey, "Minerals yearbook: Mica," 2018

[12] Sitaram Group, "Mica Scrap," 2020. https://www.sitaramgroup.co.in/mica-flakes-powder.html

[13] MICAMAFCO, "Micanite," 2011, http://www.micaworld.in/micanite.html

[14] Continental Trade, "Micanite types," 2022, https://www.continentaltrade.com.pl/micanite-types

[15] Zlobik, Alvin B., and United States Bureau of Mines, "Mica," 1979

parts, rubber, oil drilling mud, welding electrodes, asphalt roofing, drywall, swimming pool floorings, aerospace, and acoustics, among others.[16]

Mica splittings. Mica splittings are part of the sheet mica value chain. They are the thinnest category of sheets obtained from block mica: splittings refers to laminae of block mica that are dressed to a maximum thickness of 0.0012 inches.[17] They can be sold in different forms: book mica, meaning individual books of mica from the same block or same thins, each block containing 4 to 10 sheets; wrapper mica splittings, which are book-form splittings that are split into a thickness between .00075" (0.019 mm) to .0015" (0.38 mm); and loose mica splittings, which are heterogeneous shapes of mica arranged in irregular order that are packed loosely in containers in bulk form.[18] Mica splittings are used as the basis for *Micanite*.

Mica thins. Mica thins are part of the sheet mica value chain: mica thins refers to sheets obtained from block mica and dressed to a thickness of 0.002 to 0.007 inches.[19] Mica "thins" are, paradoxically, the second-thickest form of sheets obtained from book of mica, after block mica.

Muscovite mica. Also known as potassium mica, muscovite mica is a variety of mica that is colourless to pale green in colour and presents interesting visual properties as well as insulation properties. It is the most frequently mined mica, and is the main type mined in the *Bihar Mica Belt* in India.[20]

Phlogopite mica. Also known as magnesium mica, phlogopite mica is a minor type of mica that is yellow to dark brown in colour and presents interesting heat resistance qualities. It is particularly mined in Madagascar.[21]

Scrap mica. Scrap mica is generally any mica of a quality and size not suitable for use as sheet mica. It frequently refers to what is left over from the mining of books of sheet mica. Per the Bihar Mica Act in India, scrap mica is defined as mica pieces under 6 sq. inches (38.7 cm^2). Scrap mica is found in dumps near mining shafts, where mica pickers go through the debris and pick out shiny flakes or scrap. The "scrap mica value chain" begins with these products and is used to make *Mica flakes, Mica powder,* and *Mica paper,* among others. Mica scrap itself, when it is of good quality, is crushed and then sold as "crushed mica scrap."

Sheet mica. Sheet mica refers to semi-finished mica products hand-cobbed with knives from thick, book-like blocks of mica. The term "sheets" is used because these products have a relatively large surface area (more than 6.5 cm^2) while being relatively thin – as against scrap mica, which is considered as having a smaller surface area.[22] The term "sheet mica value chain" refers to the products derived from mica books and their uses (*see Mica blocks, Mica films, Mica splittings, Mica thins*).

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[16] Kogel et al., *Industrial Minerals and Rocks*, 2006
[17] Kogel et al., *Industrial Minerals and Rocks*, 2006
[18] Sitaram Group, "Processed Mica," 2020. https://www.sitaramgroup.co.in/processed-mica.html
[19] Kogel et al., *Industrial Minerals and Rocks*, 2006
[20] Imerys, "Mica," 2022. https://www.imerys.com/fr/mineraux/mica and Kogel et al., *Industrial Minerals and Rocks*, 2006
[21] Kogel et al., *Industrial Minerals and Rocks*, 2006 and International Labour Organisation and Madagascar Ministry of Mines and Strategic Resources, "Rapport provisoire: Recensement des exploitants du mica," 22 June 2021
[22] Kogel et al., *Industrial Minerals and Rocks*, 2006

1. Introduction

Mica is a naturally occurring mineral with outstanding properties that make it sought-after in a number of industries.[23] This report, commissioned by the Responsible Mica Initiative,[24] explores the mica value chain in one country where small-scale artisanal mining of mica takes place: India. Fundamentally, this report is a companion to an online platform[25] that hosts a model of the mica value chain both in its current state, and under potential scenarios for the future in which mica workers' earnings increase towards a living income. The report presents the background information that was used to build the online model (Section 2) and the assumptions and consequences of three scenarios, each exploring the impact of legalising the mica trade as well as paying a minimum wage or a living wage for mica pickers and workers (Section 3). The report includes a glossary, bibliography, and two annexes – one detailing the general methodology used to build the model and another giving basic instructions for how to use the online tool.

Mica's insulation properties exceed that of all comparable materials due to its extremely high temperature resistance and low thermal expansion. This explains its wide use in the electrical and electronic sector, as well as heavy industry. Regarding visual properties, mica also makes it possible to make pearlescent pigments, but it also extends the shelf life of pigments, brightens their intensity and reinforces the resistance and flexibility of products it is mixed with, hence its large use in the paintings sector, but also in cosmetics products and even in the construction sector (plaster, cladding, joints…). As a result, it is also largely present in 2nd-tier sectors such as the automotive industry, where it can be found in many car components (paints, electrical and electronic parts, insulators, fenders and fascia, brake pads…).[26]

According to TMR (Transparency Market Research), the total market value of mica, including both the natural and synthetic forms, was over half a billion dollars (US$ 576.1 million) in 2020; in 2015, the market corresponded to a total volume of 951,129 tonnes (more recent data on the volumes figure was not available).[27] In 2015, natural mica represented roughly 90% of this market, both in value (US$

[23] There are 37 different types of natural mica, among which only 2 are widely used by industries: muscovite (potassium mica) is the most frequently mined mica and presents interesting visual properties as well as insulation properties, while phlogopite (magnesium mica) is a minor type which provides interesting heat resistance properties.

[24] The Responsible Mica Initiative is a consortium of more than 80 members drawn from a cross section of industries that produce or use mica as well as industry associations and civil society and non-governmental organizations, working together for more sustainability and respect for human rights in the mica value chain.

[25] http://micavaluechain.lebasic.com/

[26] There also exists synthetic mica, which is made artificially by heating certain raw materials, but it is produced in far smaller quantities than natural mica. Its properties, partly similar to natural mica, are mainly interesting for cosmetics. In most cases the two products – natural and synthetic – are not substitutable (yet).

[27] More recent data on volumes/weight traded was not available in the open source, except for the UN COMTRADE database. However, the latter appears to significantly under-report mica exports: as an example, in 2021 only just over 500,000 tons were reported, when a more likely figure would be around 1,000,000 tons or more given market growth projections. Likewise for 2015, while the data cited by SOMO/Terre des Hommes from a report by Transparency Market Research put the volume at 950,000 tonnes, COMTRADE put the figure at only 390,000 tonnes.

429 million) as well as volumes (846,505 tonnes). In the near future, this market is expected to grow at almost 3% per year in value for the period 2021-2031.[28]

A significant part of mica mining worldwide is done in the form of artisanal and small-scale mining, as opposed to industrial mining. One country where this is practiced is India, possibly the world's largest exporter of mica.[29] Mica mining in these conditions requires intensive labour – both the mining of block/sheet mica, and picking mica scrap out of the leftovers left from digging the mine shaft. Breaches of human rights are quite common in these mica mining setups, from dangerous working conditions, precarious employment, child labour, discrimination and exploitation. These risks are all the more important in the cases of illegal mica mining which are quite frequent in countries such as India.

Civil society organisations as well as the major industry actors using components made from mica both acknowledge that the low wages much below the living wage which are received by mining employees (and the low income made by independent mica miners and pickers), as well as the illegality and informality of the mica picking and mining activities, sit at the heart of many of these problems. In 2020, the Responsible Mica Initiative, a non-governmental organization created to establish fair, responsible and sustainable mica supply chains, established a taskforce to develop quantitative benchmarks on living income and living wages in the mica sector, starting with Bihar and Jharkhand in India.

However, the consequences of the implementation of living wages on the costs for the industry actors along the chain is unknown. In order to enable such changes in the mica industry, there is a need to:

- evaluate the concrete impacts of paying living wages / incomes, as well as legalizing and formalizing the mica sector
- evaluate the capacity of the different use sectors (paintings, cosmetics, electronics, automotive industry, construction…) to buffer such costs increases,
- but also to better understand to which extent different stakeholders along the processing chain of mica could take on their margins to cover living wages and living income at the picking/mining and processing stages.

In this context, RMI commissioned BASIC to conduct a study with three objectives:

1. To provide relevant estimates for the distribution of value, costs, taxes, and net profit margins of a set of semi-finished industrial goods made predominantly from mica, with a focus on the share of costs corresponding to the wages of mica processing employees and/or mica miners and pickers… and the share that these semi-finished industrial goods represent in the total costs of a set of finished goods sold to consumers.
2. To build an operational tool enshrining this model and enabling users to display all the results of the calculations , make customised estimates based on key variables (mining types, quality, etc.) and build simulations of the introduction of living wages / income and payment of taxes at the mining stage.

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[28] TMR, cited in SOMO and Terre des Hommes, "Global mica mining and the impact on children's rights," 2018, and TMR, "Mica Market," January 2022

[29] See Figure 14 below.

3. To write a report that summarises findings, including a guide to the online tool.

Given the complexity of the industrial goods being composed of mica, and of the related value chains, BASIC and RMI agreed to let the study focus on a limited set of goods and mica mining/processing countries in order to serve as a "proof of concept" that can be extended in a second stage to more products, countries and end-use sectors.

The three main sectors that were retained for the study were: paints and coatings; cosmetics; and automobiles (excluding electronics/circuitry). This in turn entailed modelling about 20 intermediate products (such as pigments and mica board) and eight finished products (nail enamel or anti-corrosion paint, for instance).

Category	Finished product
Paints and coatings	DIY Anti-corrosion paint DIY Architectural paint (interior/exterior) OEM refinish paint
Cosmetics	Nail enamel Eyeshadow Lipstick
Automotive	Thermal car Electric car

Table 1. List of finished products examined by this study, by category: paints and coatings, cosmetics, and automotive

The remainder of this report is divided into two sections. Section 2: Mica and its ecosystem lays down the bases for the mapping of the scrap mica value chain, with a review of mica and its uses, mica mining worldwide and mining conditions in India. The main steps of the value chain are laid out and the basics of the mica model are introduced. Section 3: Scenarios for change explains the modifications to the basic/current mica value chain that could be applied in three different prospective scenarios in India – legalisation of mining, legalisation with a living wage, and the formation of mica worker cooperatives. This section presents each of the scenarios, its assumptions and costs, and gives a brief overview of its impacts on prices at various points in the chain.

DISCLAIMER: Figures presented in this report are almost always the result of research validated by multiple sources, and therefore quantitative figures are often averages of multiple data points. Further, some degree of simplification of reality is needed to build models and scenarios. Individual situations in reality may therefore vary from the figures given in the model and three scenarios. For more on how price and cost values were obtained for the model, see Annex 1: Modelling methodology.

2. Mica and its ecosystem

In this section of the report, we present mica and its properties, its principal uses, how it is mined and collected, and what are the stages of the value chain from raw mica through successive transformations until one reaches the finished product. Our focus is on the scrap mica value chain,

which feeds into three main categories of finished products studied here: cars (except electronics), cosmetics, and paints and coatings.

2.1. Setting the stage: What is mica?

Mica is a naturally occurring mineral with extraordinary properties that make it highly sought-after in many industries. Specifically, mica remains stable when confronted with all kinds of stressors – it can withstand temperatures above 900°C, has a high dielectric strength (is inert to voltage differences), and reacts to neither UV light nor moisture. It is lightweight, flexible, and strong. These properties of mica are exploited in numerous objects and industries: electronics, cars, airplanes, aerospace, household appliances, plastics, heavy industry, to name a few. In addition, mica, when ground under the right conditions, acquires a shimmering quality that is sought-after to produce pigments. These pigments are then used in cosmetics as well as paints and coatings, and particularly in automotive paint.

Broadly speaking, mica is collected into one of two forms: sheet mica and scrap mica. Sheet mica is typically derived from blocks of mica that have a book-like structure. The "pages" of the book are individual mica sheets which are cobbed by hand from the mica block with sharp knives. Depending on their thickness, sheets are suitable for different purposes. The thickest are used as-is and cut or punched into shapes; the intermediate size is used to make capacitors; and the thinnest pieces are bound with resins at high temperature to produce micanite (also known as built-up mica), a substance that can be moulded into different forms – sheets, washers, tubes, boards…, flexible or rigid, while retaining all of mica's beneficial qualities. Block mica is found deep underground – up to a dozen or so meters –, where it is sought out by artisanal miners due to its high value.

Figure 1. Images of book mica, from which mica splittings and thins are cobbed by hand [30]

[30] Images are royalty-free from Shutterstock.com.

Figure 2. Images of book mica, from which mica films, splittings, and thins are cobbed by hand. Image courtesy of RMI

Figure 3. Crude mica (left) and mica splittings (right). Photo courtesy of RMI

While mica blocks come from underneath the ground, mica scrap is typically found at the earth's surface, as a by-product of digging the mine shaft. The heaps of debris surrounding each mine shaft are a mix of dirt, mica, and other minerals. The scrap mica value chain starts here, where workers dig through the debris (in Hindi: *dhibra*) looking for the tell-tale shine of mica flakes. After being sorted to remove impurities, mica scrap is then processed and valorised in the form of flakes and powder. Depending on the quality of the scrap and the method used to transform it, mica scrap can fetch very different prices by weight; the end-use of scrap mica is also dictated by the quality of the scrap. For instance, low-quality powder used as an adjuvant to the slurry in oil drilling wells fetches a much

lower price than mica suited to make ultra-high quality pearlescent pigments, although both are in powder form.

Figure 4. Hammering away to release mica books (left) and sorting through piles of debris/*dhibra* (right). Photo courtesy of RMI

Historically, mica blocks were much more valuable than mica scrap. However, in the last 50 years the development of new technologies, particularly in the pigments and electronics businesses, dramatically increased demand for scrap mica and its derivatives. Our study focuses exclusively on the scrap mica value chain.

2.2. Uses and transformation of scrap mica

Error! Reference source not found. below illustrates the scrap mica transformation chain in its main c omponents.

Figure 5. Simplified scrap mica value chain. Source: BASIC, 2022

Scrap mica transformation flowchart

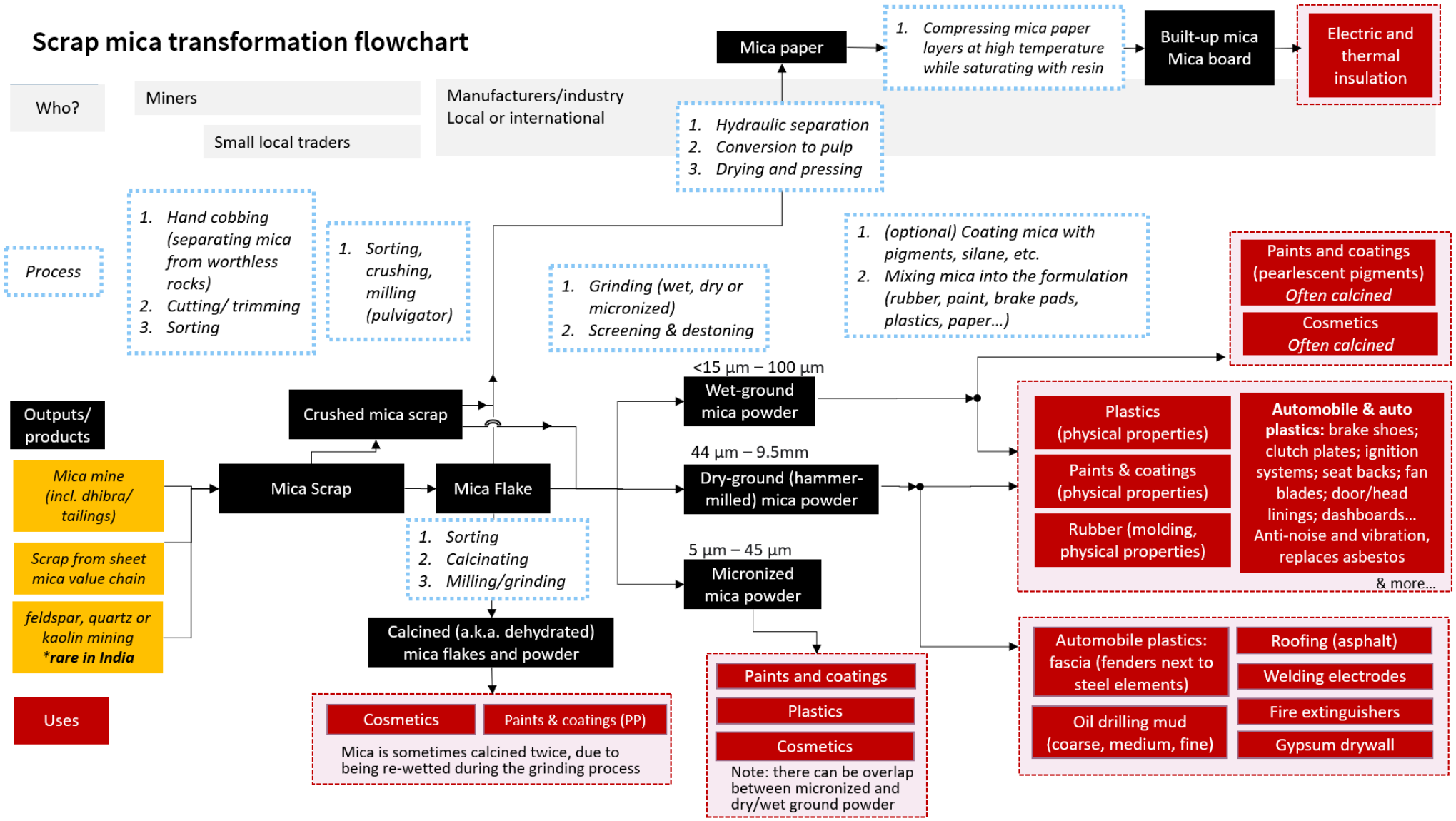


Figure 5 makes it possible to see how mica scrap is transformed – the different operations applied to mica are described in the rectangles with dashed blue lines; intermediate products in black; and final applications of the product in red. This flowchart of the mica transformation chain was used as the basis of the model for the scrap mica value chain (detailed in section 2.5).

In Figure 5Error! Reference source not found., one can see how mica is first into crushed scrap and flakes, which are in turn transformed into mica paper or different forms of ground mica, i.e., mica powder. Mica paper is an excellent thermal and electrical insulator and has a wide array of uses. It can be pressed with resins at high temperatures to create a more rigid product known as mica board. This last product is used as an insulator in electric vehicle batteries.

There are different ways of grinding mica flakes into powder: conventional export language distinguishes between dry-ground (hammer-milled), wet-ground (the "finer" and more expensive type of grinding that is preferred for the substrate to pearlescent pigment), and micronised mica (i.e., ultra-fine mica). In reality, these qualifications often overlap: that is, wet grinding and dry grinding can both produce mica powder that is in the "micronised" size range, despite there being an instrument called a microniser. Mica powder has an extremely diverse portfolio of uses, from paints and coatings to plastics to welding electrodes, drilling mud and various parts of automobiles.

Calcination is a process that dehydrates mica and facilitates delamination (splitting into very thin sheets). Much mica that is used in pearlescent pigments and from there into OEM coatings or cosmetics is calcined at least once, if not twice, during processing.

Figure 6. High-quality mica scrap. Photo courtesy of RMI

Figure 7. Mica flakes made from *dhibra* or crude mica. Photo courtesy of RMI

Figure 8. Calcined mica. Photo courtesy of RMI

Figure 9. Different types of mica powder (calcined at top, ordinary at bottom). Photo courtesy of RMI

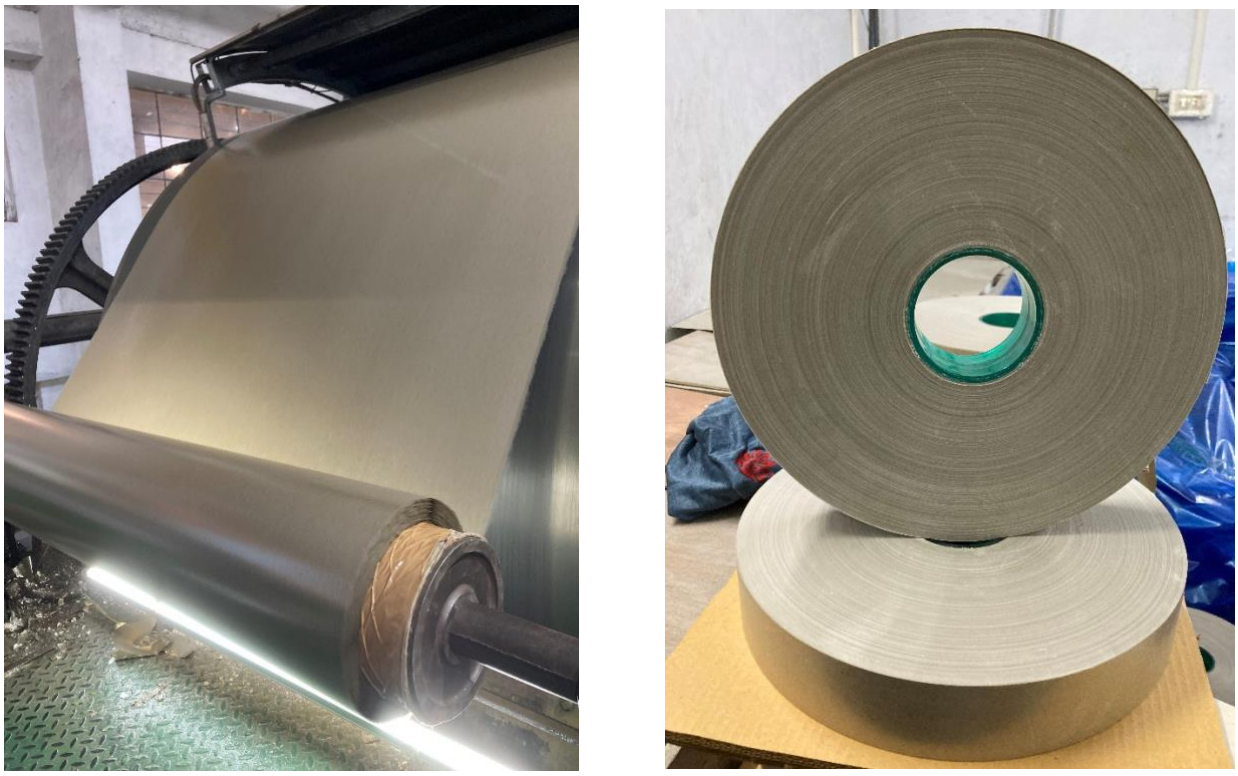


Figure 10. Mica paper (left) and mica tape (right). Photo courtesy of RMI

In this study, we focus on three main sectors of use for scrap mica: paints and coatings, cosmetics, and automotive. The key players in these industries are presented below.

In paint and coatings, based on data from 2021, the number-one company was PPG, which is an RMI member, with sales around 16.8 billion USD. AkzoNobel, also an RMI member, ranked third (11.37 billion USD), while another RMI member (BASF Coatings) ranked seventh (3.90 billion USD).

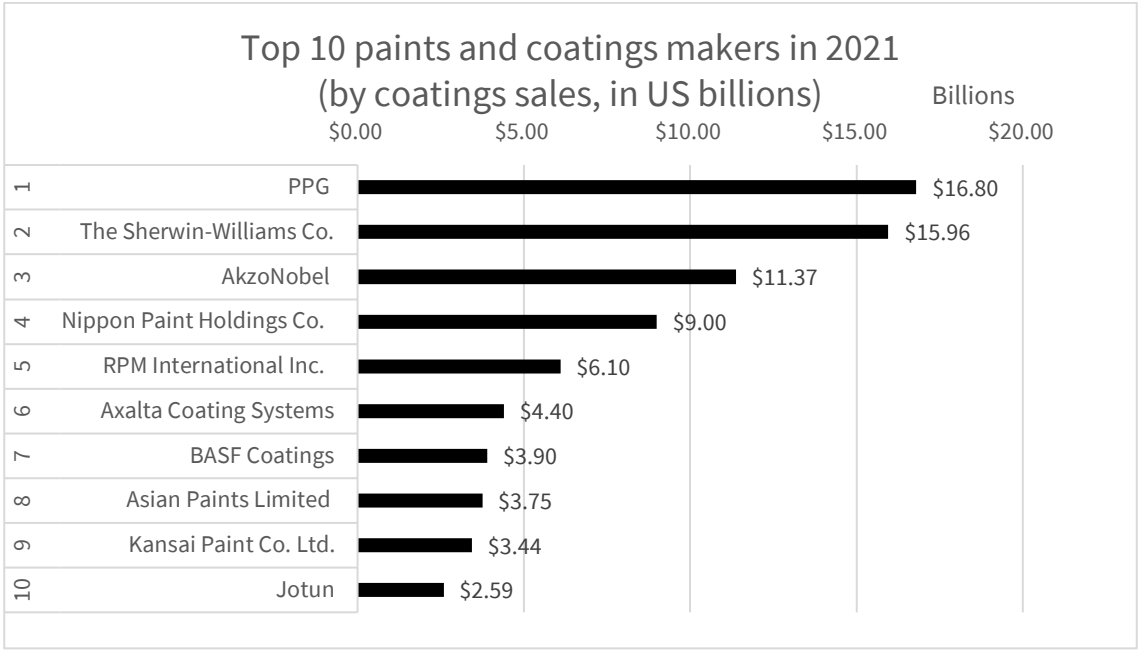


Figure 11. Top 10 paints and coatings companies, based on sales of coatings in 2021. Source: BASIC, adapted from Paints & Coatings Industry Magazine, July 2022[31]

ple, in 2021 only just over 500,000 tons were reported, when a more likely figure would be around 1,000,000 tons or more given market growth projections from 2015.

In the cosmetics industry, the top-ten list contains several RMI members, including number-one L'Oréal (33.93 billion USD revenue), number-5 Shiseido (8.73 billion USD), LVMH at rank 7 (6.63 billion USD), and Coty at rank 9 (4.71 billion USD).

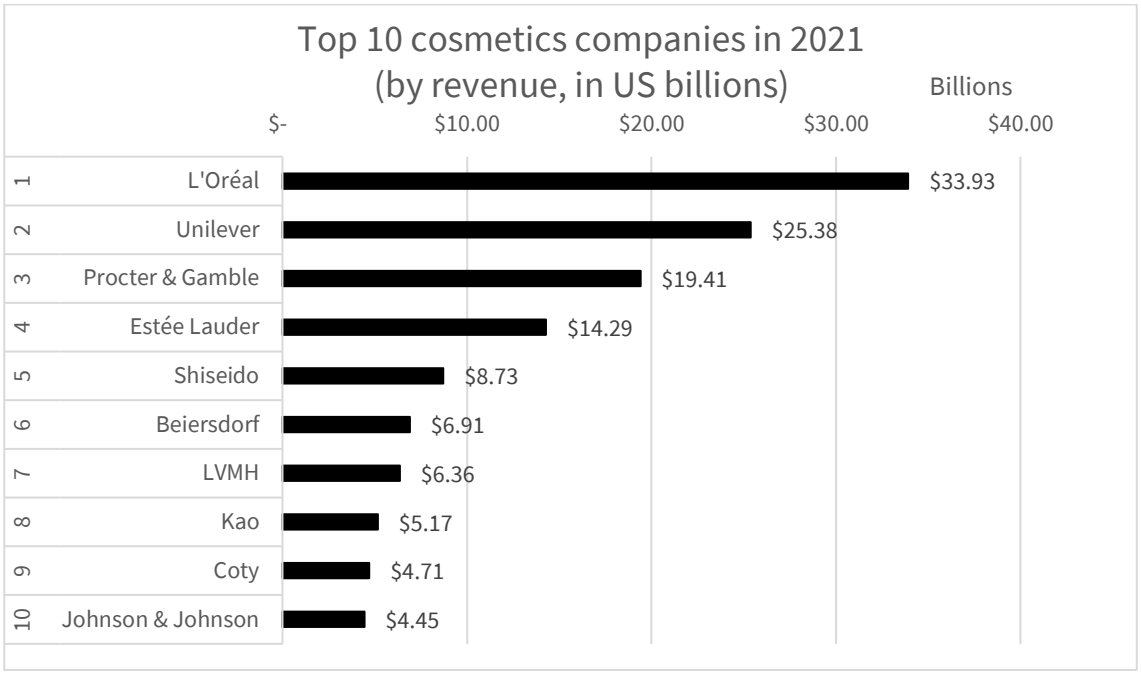


Figure 12. Top 10 cosmetics companies, based on sales in 2020. Source: BASIC 2022, adapted from Cosmetics Technology, 2021[32]

[32] Cosmetics Technology, "Top ten cosmetics companies in the world," 26 February 2021, http://www.tinyurl.com/2cn9fc3s

We also mapped the main vehicle companies, ranked by number of vehicles sold in 2021 – see Figure 13. Toyota takes the lead, followed by Volkswagen (which is an RMI member through its subsidiary, Porsche). The next RMI member is BMW, which ranked 10th in vehicle sales in 2021. RMI member Mercedes Benz ranked 12th.

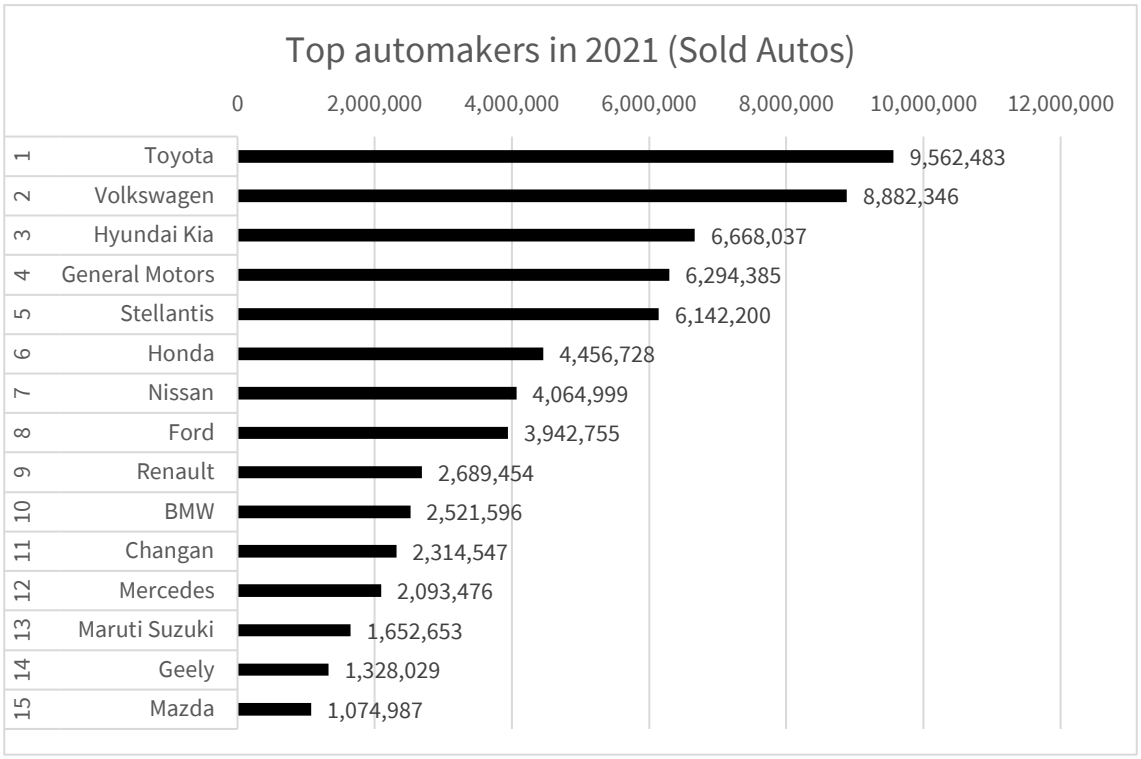


Figure 13. Top 15 automakers, based on number of vehicles sold in 2021. Source: BASIC, adapted from F&I Tools[33]

[33] F&I Tools, "Worldwide Car Sales by Manufacturer," 2022, http://www.tinyurl.com/2dznulef

2.3. Mica mining worldwide

Statistics on global mica reserves are hard to come by, as are reliable statistics on mica production. However, it is clear that India is a major player in the mica business. The latest data from the British Geological Survey published in 2022 places China as the world's top mica producer, followed by Madagascar and the USA (see Figure 14 below), but these figures should be taken with caution.

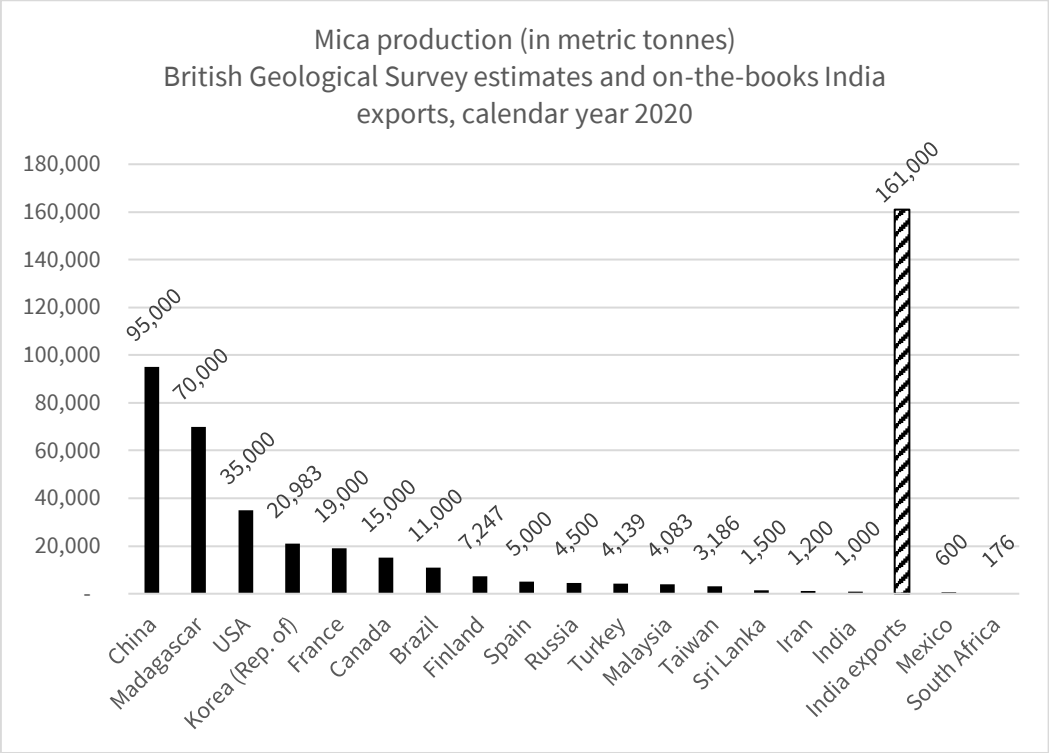


Figure 14. World mica production in metric tonnes by country of origin; in black stripes, export of raw mica from India (HS code 2525), calendar year 2020[34]

Indeed, in these official statistics, India lags far behind at 1,000 metric tonnes produced per annum.[35] However, customs data betray the fact that this estimate is far below the real production coming out of India. In the calendar year 2020, according to customs data, India's exports of raw and worked mica, of all kinds, represented a minimum of 161,000 metric tonnes worth 75 million USD, i.e. more or less the production of China and Madagascar combined by weight. The sub-contribution of scrap mica and its derivatives (flakes, powder, and mica scrap) to this total across the last three years (Oct.1, 2019 to September 30, 2022) was on average per year 106,000 tonnes worth 43 million USD.[36,37] The

[34] Source for mica production: British Geological Survey, "World Mineral Production 2016-2020," 2022; for export data from India, analysis of customs data from Datamynes, HS codes 2525, calendar year 2020. For India, UN Comtrade lists slightly lower figures for calendar year 2020: exports weighing 130,000 metric tonnes worth $57 million.
[35] British Geological Survey, "World Mineral Production 2016-2020," 2022.
[36] BASIC analysis of customs data from Datamynes, HS codes 2525 and 6814, calendar years 2019 through 2022.
[37] That same year, India also exported significant volumes of worked mica (HS code 6814: fabricated mica, built-up mica/micanite, mica paper…), for a total value of 6.4 million USD. BASIC analysis of customs data from Datamynes, calendar year 2020. Unlike price, reliably calculating the weight of worked mica (HS code 6814) from customs data is not possible, because the products are usually categorised as "numbers" or "pieces" without any indication of their weight.

disparity between export data and production data points to the fact that much of the mining in India is currently illegal – outside the purview of the state – and therefore cannot be tracked by the authorities.[38]

Not all of Indian mica comes from Bihar and Jharkhand. The largest deposits occur in Jharkhand,[39] but mica is also mined in Andhra Pradesh and Rajasthan. However, in these two provinces mica is mined industrially and legally. According to one interviewee familiar with the market, approximately 10-20% of mica on the market comes from Andhra Pradesh and Rajasthan, and the remainder comes from Bihar and Jharkhand.[40] The figure below, borrowed from Thompson-Reuters and using 2015 data, is consistent with this estimate.[41]

[38] A similar tendency to underreporting the contribution of Bihar and Jharkhand to the Indian mica sector may be at work in the Indian Bureau of Mines's calculation of mica reserves. Although Bihar and Jharkhand are often singled out for their extraordinary reserves of mica (in the so-called Bihar Mica Belt), in Bureau of Mines data for 2020 Andhra Pradesh is cited as having 20 times the reserves that Bihar has and 150 times more than Jharkhand. It seems possible that the low figures in Jharkhand and Bihar are the result of under-reporting from State authorities, who have jurisdiction over mica as it is a "minor" mineral. See Indian Minerals Yearbook 2020 59th ed.: Minor Minerals, 30.16 : Mica, July 2021

[39] The latest estimates published by the JSMDC date to 1995 and claim that Jharkhand has reserves of 13 million tonnes of mica. JSMDC. "Mineral Reserves & Production," 1995. https://www.jsmdc.in/web/MineralReservesProduction.php

[40] BASIC Interview with mica expert, 1 April 2022

[41] Unfortunately, Datamynes export data did not specify where the mica originates from; it was therefore impossible to use the data to estimate provenance as in Figure 15.

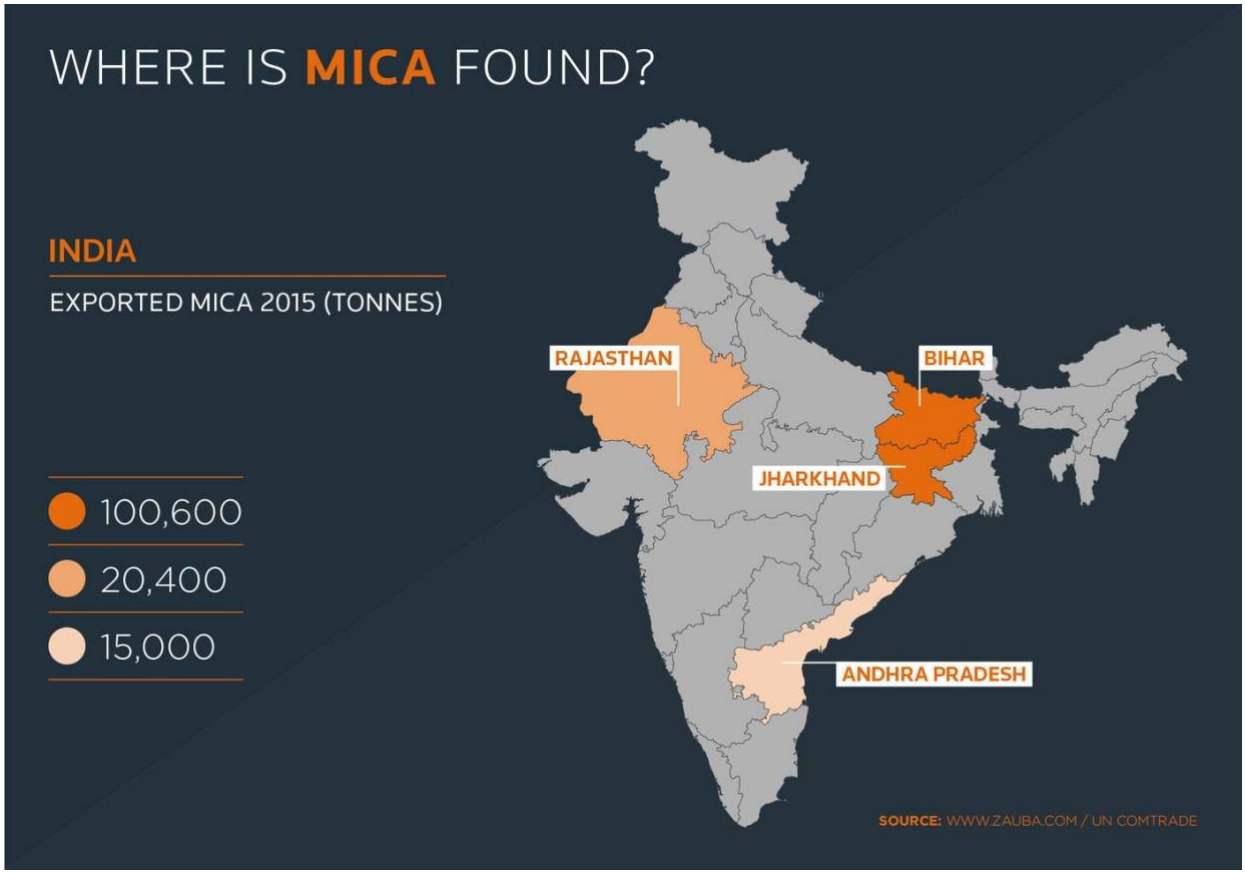


Figure 15. Estimated origins of exported mica within India, based on 2015 export data. Figure taken from Thompson Reuters, 2016 or 2017[42]

According to another interviewee, mica from Rajasthan and Andhra Pradesh is not suitable for making pearlescent pigments because of its chemical make-up, heavy metals content, and calcination temperature. Nonetheless, many industries are allegedly trying to find a way to make pearlescent pigments using Rajasthan mica due to the chaotic and illegal nature of the market in Bihar and Jharkhand.[43] As this study focuses on artisanal and small-scale mining, only Bihar and Jharkhand will be considered within the India perimeter.

2.4. The mica mining context – India

In India, the illegality of mica picking (for scrap) and mining (for blocks/sheets) is only one among many factors that create an situation of precarity for mica workers and their families. In India mica pickers and miners are price takers. They are rarely organised in any kind of cooperative that would be able to negotiate a better price, and there are virtually no inspections by the state to ensure that

[42] Figure found in Bliss, "Child Labour in India's Mica Mines : The Global Beauty Industry," Geography Bulletin Vol 49, No 3, 2017; citing Thompson-Reuters, "Where is mica found?", 2016 or 2017, http://www.tinyurl.com/227wy5cb
[43] BASIC Interview with mica expert, 9 February 2022

a minimum wage equivalent is paid; inspections rather take the form of raids on illegal mines or confiscation of trucks carrying mica.[44]

As a result of these factors, mica pickers and factory workers do not earn a living income or wage (see explanation of a living wage below). This is true of mica pickers in Bihar and Jharkhand, as well as factory workers in Jharkhand. Indeed, in the February 2022 Living Wage study commissioned by the Responsible Mica Initiative it was highlighted that accounting for the revenues from mica-related activities only, the gap in living income reaches 81% for mica pickers in Bihar and 72% for mica pickers in Jharkhand. Factory workers earn a little under half of a living wage.[45] As a result of this poverty and living hand to mouth, in India mica-picking families are often in debt to loan sharks, for instance to pay for unexpected events such as a health emergency, or school fees, or food.[46]

Living wage & living income: A brief overview
A living wage (or living income) is "a level of income that allows an individual worker to meet his/her basic needs and those of his/her family, at decent standards."[47] Living wages (or living incomes) are calculated based on costs of living, which are calculated as a "basket" of costs enabling a decent standard of living. The basket contains items such as quality housing, sufficient and nutritious food, childcare, education, healthcare, and a percentage left for leisure and precautionary savings to face unexpected expenditure. The research to date on the mica mining ecosystem in India, conducted by the Fair Wage Network on behalf of RMI, suggests that there is a large gap between what mica pickers and factory workers earn today and what they would need to be paid to earn a living income and wage (see Figure 16). *Note: this study refers to living wage when a person is a fully-fledged employee of the company, and a living income when the person is not.*

[44] BASIC Interview with mica expert, 1 April 2022; Child In Need Insitute, "Child Labour in Mica Mines of Koderma & Giridih District of Jharkhand," 2018; Centre for Responsible Business, "Road-Map for Sustainable and Inclusive Mica Industry in Jharkhand: Balancing Interest of the State, Business and People," 2018. https://c4rb.org/insights/report/MICA-Roadmap.pdf.

[45] Responsible Mica Initiative, FairWage Network, Sentio Advisory Initiative, "Report on wages, working and living conditions of Mica workers in India," February 2022

[46] Child In Need Institute, "Child Labour in Mica Mines of Jharkhand- A situation analysis report," 2018.

[47] Fair Wage Network, Annex to Responsible Mica Initiative, FairWage Network, Sentio Advisory Initiative, "Report on wages, working and living conditions of Mica workers in India," February 2022

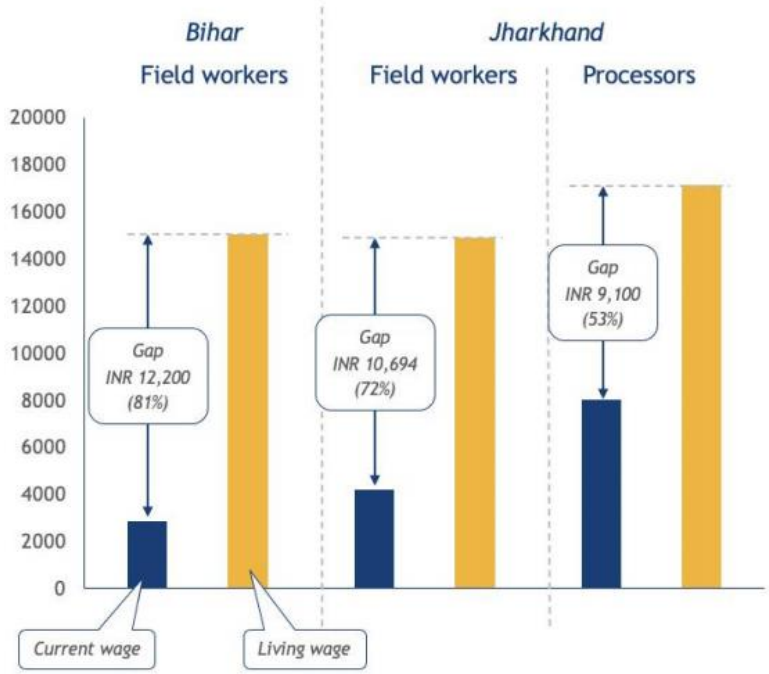


Figure 16. Current income, living income, and income gap for pickers in Jharkhand and Bihar, and factory workers in Jharkhand.

Source: RMI, Fair Wage Network, and Sentio Advisory Initiative, "Report on wages, working and living conditions of Mica workers in India," February 2022

Working conditions in mica mines are dangerous, as India conducts artisanal, small-scale mining (ASM) in conditions that are accident-prone. According to NGOs and media on the ground in India, it is not uncommon for people to die when a mine shaft collapses, or to be injured in accidents.[48,49] Breathing in dust can be an irritant causing silicosis, asthma and bronchitis, illnesses common among children and adults in mica picking communities.[50] There is additional risk of repetitive stress injuries and musculoskeletal disorders: back pain is a commonly reported health impact of mining and mica picking.[51] Injuries and abrasions to the skin are common given mica's sharp edges, on the whole of the body but especially on hands and feet.[52] In factories, workers are also known to suffer from tuberculosis, cough, and asthma due to exposure to dust without personal protective

[48] Reuters, "Blood Mica: Deaths of child workers in India's mica 'ghost' mines covered up to keep industry alive," 3 August 2016 and Child In Need Institute, "Child Labour in Mica Mines of Jharkhand- A situation analysis report," 2018
[49] SOMO and Terre des Hommes, "Child labour in Madagascar's mica sector," November 2019
[50] Child In Need Institute, "Child Labour in Mica Mines of Jharkhand- A situation analysis report," 2018
[51] SOMO and Terre des Hommes, "Child labour in Madagascar's mica sector," November 2019 and International Labour Organisation and Madagascar Ministry of Mines and Strategic Resources, "Rapport provisoire: Recensement des exploitants du mica," 22 June 2021
[52] SOMO and Terre des Hommes, "Child labour in Madagascar's mica sector," November 2019 and International Labour Organisation and Madagascar Ministry of Mines and Strategic Resources, "Rapport provisoire: Recensement des exploitants du mica," 22 June 2021

equipment (PPE).[53] In India, it is typically boys and men who do the shaft digging, while women and younger children pick mica out of the waste heaps left behind by mining. In factories in India, women mostly do the secondary sorting of mica, while men operate the heavy machinery.

In India, mica pickers and miners are unable to work 3 to 4 months out of every year due to the rainy season. They sometimes try to diversify their activities, for instance agriculture (herding or growing plants) or running a small shop; however, there are villages where nearly everyone is a mica picker and must make their dry-season income support them through the rainy season.[54]

To make things worse, public services are poorly developed in mining areas. In India, many mica mines and their *dhibra* dumps are located near remote villages in the forests of Bihar and Jharkhand, where public services are underdeveloped. Schools, day-care centres (e.g. Anganwadi centres in India), health clinics are absent, dysfunctional, or far away, and government adult employment schemes are not available.[55] Bihar and Jharkhand have high levels of absenteeism in schools: around 40% of children are enrolled in primary school, but not present, against an average of 29% in India.[56]

Gender and caste in the Indian mica industry
According to many studies,[57] the mica industry in Jharkhand and Bihar is highly gendered, in the sense that women and men do not conduct the same type of work. Men, and sometimes boys, are virtually the only ones who dig mining shafts and work underground to collect book mica. Women and smaller children usually work around the mining shafts, sorting through piles of *dhibra*. There is also a role for women workers at home, who sort mica coming out of nearby *dhibra* dumps and sell it to dealers in a putting-out system. There is also a gendered element to work in factories. In factories, the most labour-intensive work and work involving machines is left to male workers (grinding, operating pulvigators, pulverisers, micronisers, destoning machines, calcination machines). Female workers are involved in screening and handpicking (removing foreign material), if the mica bought by the processor is of insufficient purity. According to one source, many mica pickers and miners belong to the lowest castes – Scheduled Tribes and Scheduled Castes.[58] People above these castes reportedly work farther down the value chain, for instance as small village-level traders or *munshi* (agent). It is worth noting here that many major mica export businesses are family-based enterprises that have worked in the mica sector for generations, and it is unlikely that many of these operators are from Scheduled Castes or Tribes.

[53] Responsible Mica Initiative, FairWage Network, Sentio Advisory Initiative, "Report on wages, working and living conditions of Mica workers in India," February 2022

[54] International Labour Organisation and Madagascar Ministry of Mines and Strategic Resources, "Rapport provisoire: Recensement des exploitants du mica," 22 June 2021

[55] SOMO and Terre des Hommes, "Beauty and a Beast: Child Labour in India for Sparkling Cars and Cosmetics," 2016

[56] SOMO and Terre des Hommes, "Beauty and a Beast: Child Labour in India for Sparkling Cars and Cosmetics," 2016 citing statistics from 2015..

[57] BASIC interview with mica sector experts, as well as all studies by SOMO and Terre des Hommes, and Chattopadhyay, Molly. "Sub-Contracting System and Women Workers: A Study of Mica-Manufacturing Industry of Jharkhand." Sociological Bulletin 56, no. 2 (May 2007): 33–51. https://doi.org/10.1177/0038022920070206.

[58] Child In Need Institute, "Child Labour in Mica Mines of Jharkhand- A situation analysis report," 2018

In this difficult context, many families resort to their children to make ends meet. Child labour in the mica industry is well-documented.[59] The number of children engaged in mining activities was estimated at at least 30,000 children – and potentially more – for Jharkhand and Bihar in 2016, out of a population of 300,000 artisanal miners.[60] Children typically accompany their parents to mining sites, where they help with mica picking at the surface or (boys only) dig in underground tunnels to carve out mica blocs.

Since awareness about the child labour problem emerged in the early-2010s, numerous initiatives have been undertaken to increase the transparency and integrity of the mica value chain, with the aim of eradicating child labour. Early on, private companies sponsored building schools and health centres, bought children bicycles so they can go to school, and worked with NGOs to create villages with children-friendly conditions as well as monitoring mines for child labourers.[61] The Responsible Mica Initiative is the most ambitious and comprehensive initiative to tackle this problem to date.

It should be noted that since 2015, mica in India has been considered a "minor" mineral, meaning that – as opposed to "major" minerals, which are managed by the central government – it is to be managed at the State level. This evolution in the law opens many avenues for better regulation of a sector that, for the last thirty to forty years, evolved in illegality and outside the purview of the state, despite its considerable dollar value.[62] Media reports about working conditions and child labour in mica mines have also put direct pressure on local authorities to exercise better oversight of mica mining by legalising the sector.[63]

2.5. The structure and functioning of the scrap mica value chain

This study's remit is to focus on three broad families of mica-containing finished products: paints and coatings, cosmetics, and cars (excluding electronic components). The specific products retained within each sector all contain mica, specifically mica from the scrap value chain. The sheet mica value chain is therefore out of scope for this study and will not be analysed in the below; our focus is on the scrap mica chain. After an overview of the five main steps of the value chain, we dig a little deeper into the use of mica in the paints/coatings, cosmetics, and automotive industry.

2.5.1. Overview: the five-step value chain

[59] SOMO and Terre des Hommes, "Beauty and a Beast: Child Labour in India for Sparkling Cars and Cosmetics," 2016; SOMO and Terre des Hommes, "Global mica mining and the impact on children's rights," 2018; Child In Need Institute, "Child Labour in Mica Mines of Jharkhand- A situation analysis report," 2018

[60] Terre des Hommes, "Behind the Glittering Facade – Exploitation of Children in Mica Mining in India," 2022; and interview with Indian mica expert.

[61] SOMO and Terre des Hommes, "Beauty and a Beast: Child Labour in India for Sparkling Cars and Cosmetics," 2016

[62] The key moment when Indian mica fell into illegality was the 1980 Forest Conservation Act, which banned mining in forested areas. At the time, "mining was declared 'illegal' due to non-renewal of leases, [but] mining still continued in the state (illegally), coupling the problem by adhering to lesser safety and security measures for the miners." Centre for Responsible Business, "Road-Map for Sustainable and Inclusive Mica Industry in Jharkhand: Balancing Interest of the State, Business and People," 2018. https://c4rb.org/insights/report/MICA-Roadmap.pdf

[63] Thomson Reuters, "India Begins Legalising Mica Mining after Child Worker Deaths Expose." Reuters, May 4, 2017, sec. Thomson Reuters Foundation. https://www.reuters.com/article/india-child-labour-idINKBN1802AD

For a better understanding, the scrap mica value chain – as it relates to paints/coatings, cosmetics, and cars –can be divided into 5 segments. They are as per Figure 17 below:

Figure 17. Overview of the scrap mica value chain in India

1. Mica picking. This is undertaken by mica pickers, who pick mica and sell this mica on to dealers.
2. Sorting, Primary Processing, & Export. This stage contains many sub-steps.
    a. It begins with dealers, who collect mica from villages and deliver it to aggregators. Aggregators undertake a meticulous sorting process to separate higher from lower quality mica scrap. Quality is defined by the mica's colour, size, and resistance to high temperature, among other characteristics. Mica is purchased from aggregators by primary processors, who are sometimes also exporters. In this primary processing, mica scrap is turned into mica flakes, high-quality crushed mica scrap, and mica powder, of high or low quality (depending on the quality of the material and the method used to grind the mica). Exporters conduct spot checks for mica quality and arrange for export. In India, export is most often by sea from Kolkata or Mumbai, depending on where the mica is collected. The biggest destination for semi-processed Indian mica (flakes, scrap, powder, part of HS code 2525)[64] is by far China, which captures 70 to 75% of both value and weight.

[64] The HS code 2525 covers raw or semi-refined mica, namely flakes, powder, scrap, and derivatives of sheet mica (such as mica blocks and mica splittings – code 252510). For consistency's sake since we are focused on the scrap mica value chain, this last code 252510 has not been included in the analysis. Its exclusion does little to change the analysis: when the sheet mica family products are included, the distribution of FOB prices and metric tonnage remains almost identical, confirming Japan and China's lead as manufacturers of mica-based semi-finished and possibly also finished goods.

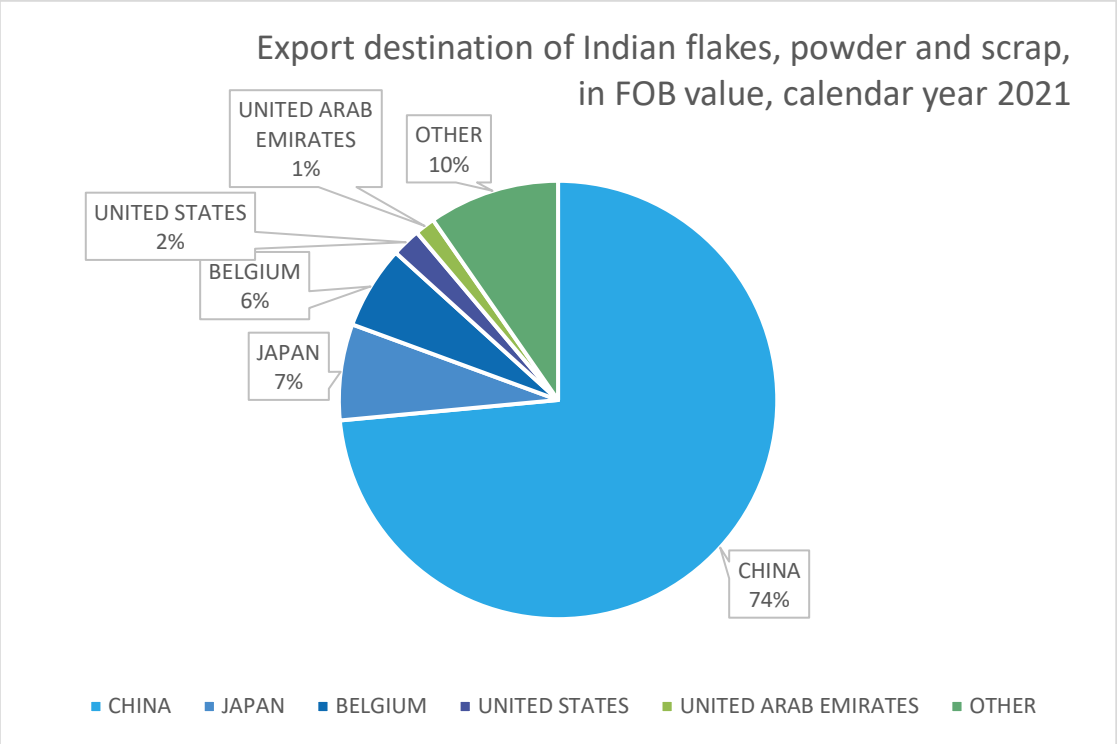


Figure 18. Country of destination for exports of Indian raw mica (flakes, powder, and scrap) in calendar year 2021, in total FOB value. Source: BASIC 2022, based on Datamynes data

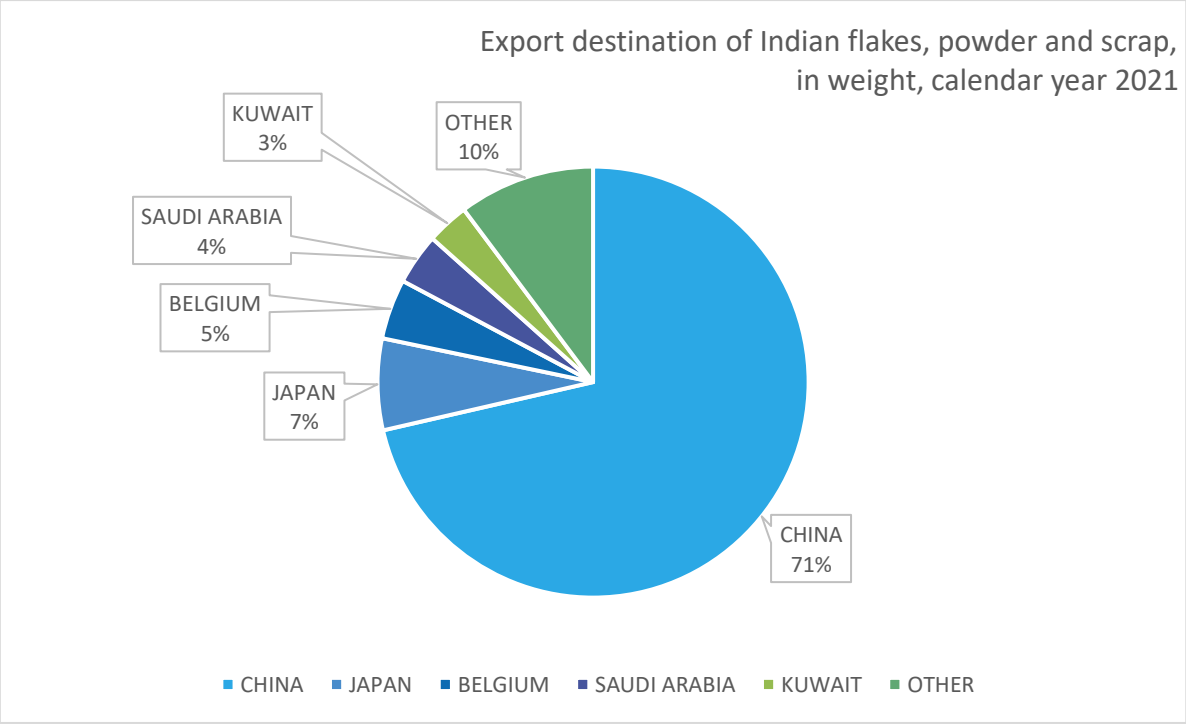


Figure 19. Country of destination for exports of Indian raw mica (flakes, powder, and scrap) in calendar year 2021, by weight in metric tonnes.[65] Source: BASIC 2022, based on Datamynes data

[65] Note: some data rows could not be processed because they were not denominated by weight.

At this stage in the value chain, mica pickers capture a small but visible chunk of the total value. For instance, the below Figure illustrates the distribution of costs, taxes, and margins for high-quality mica flakes exported from India. Pickers **capture just over a quarter of the value of the exported product** (in red in Figure 20 below), and they make no margin as they live hand to mouth (see Figure 16 in Section 2.4).

How to read a BASIC model's bar-chart value diagram
When clicking on a product in the value chain (anything rectangular-shaped), the model returns a bar-chart diagram like the below. The chart makes it possible to see value accumulation at different stages in the chain. → Different colours designate different stages in the chain: 1. Production (red), 2. Sorting, Primary processing, and Export (orange), 3. Grinding, Pressing, and Pigment manufacturing (yellow); 4. Finished product manufacturing (beige); 5. Retail (blue). In Figure 20 below, two stages are visible: Production and Sorting/Primary processing/Export. → The left-hand graphic reports the percentage of value added by actors at each stage; the right-hand graphic breaks down the value into costs, taxes, and margins (where applicable).

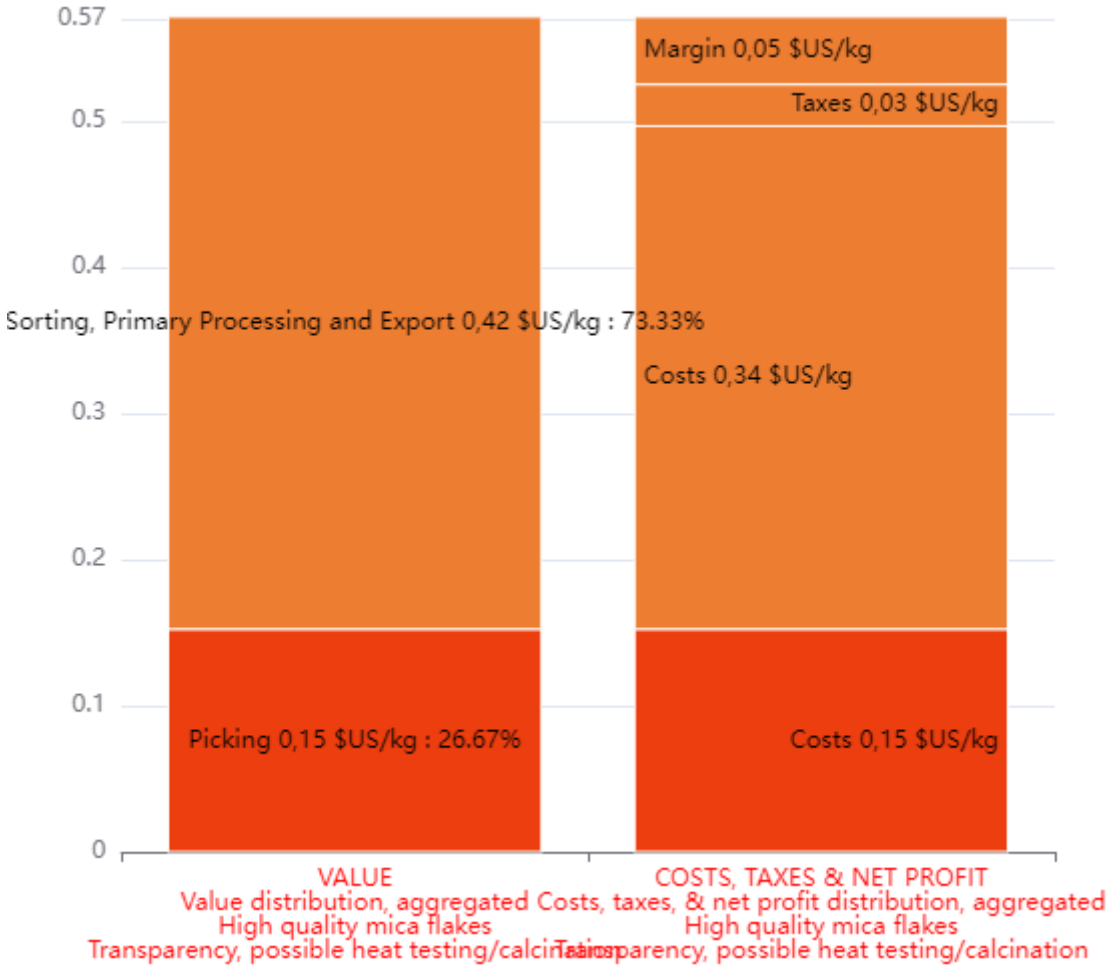


Figure 20. Value distribution of high quality mica flakes, India, export stage: value distribution (left) and costs, margins, and taxes (right). Source: BASIC 2022

3. Secondary processing: Grinding, Pressing, & Pigment manufacturing. The raw mica products that result from primary processing are handled by (mostly) non-Indian (and often Chinese – see figures above) industrial stakeholders who add value to the product in a variety of ways.
    a. One such way is to turn the mica flakes into mica paper. Much like ordinary paper, the mica flakes are separated hydraulically, converted to pulp, and then subject to drying and pressing (sometimes with an additional binder). Mica paper, which is flexible, can then be turned into thicker semi-rigid mica board, through further stages of pressing sheets of mica paper together with resins/epoxies at high temperatures.
    b. Another way is to turn mica flakes into mica powder.
        i. When this is done through dry grinding, mica loses much of its lustre, but it becomes suitable as filler for paints and can be incorporated into any number of substances, notably plastics, paints, and bituminous sheets.
        ii. When this is done through another, more expensive process known as wet grinding, a high-quality, shiny substrate is the result. This mica comes in the form of platelets and can then be coated with other substances (metal oxides), generating what are called pearlescent pigments. It is common for pigments manufacturers to import mica flakes and then wet-grind them in-house before coating them to make pigments.

According to the hypotheses of our model based on bibliographical research, pigments manufacturers bring in an average of 18% margin once all other costs are covered.[66] We assume for the purposes of the model that stakeholders at this stage in the value chain wish to keep their margins constant in the event of changes in cost structures.

When modelled, it becomes apparent that pigments manufacturing represents a significant value-add to powdered mica. This can be seen in Figure 21 below: if we take the example of a middle-of-the-road pigment (for instance, automotive grade TiO2 coloured pigment), the Indian contribution to pigments value at the bottom of the chart is largely diluted by the value-add at the pigments/industrial stage at the top of the chart (99% of the value).

[66] For the bibliography used to estimate these margins, see "Bibliography – Company profits" section. The margin can be visualised in the model by clicking on individual products (rectangular shapes) and scrolling down to see the bar-chart value distribution diagram.

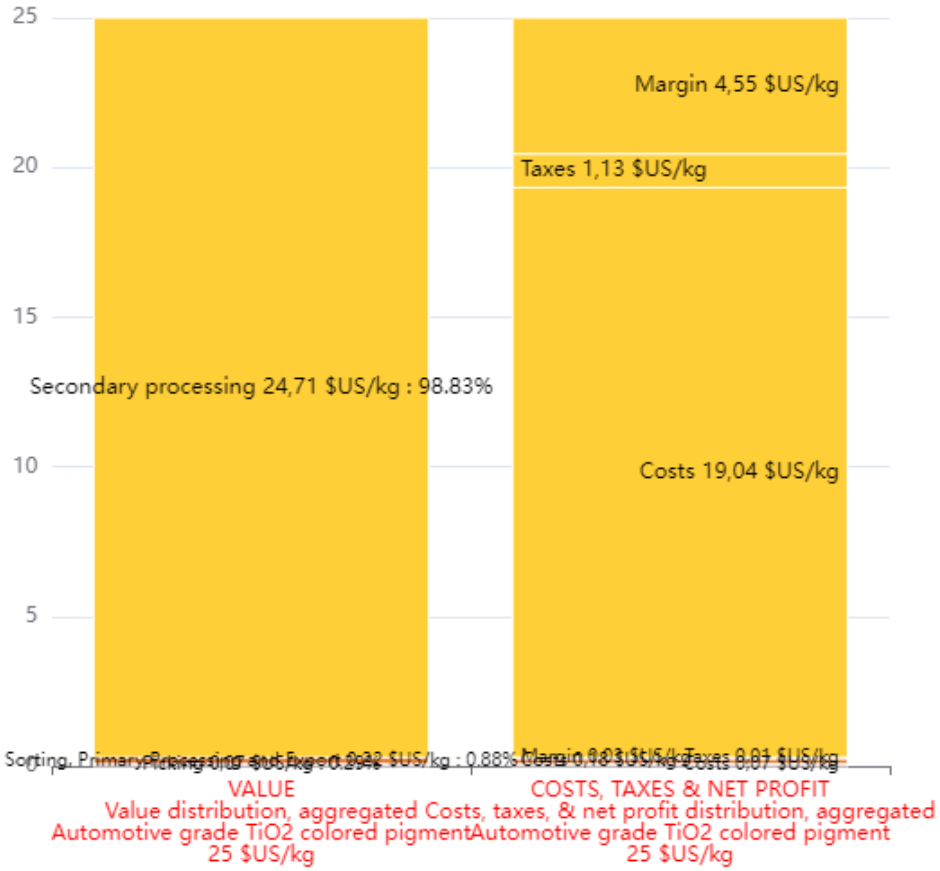


Figure 21. Value distribution for automotive grade coloured pigment at the secondary processing level (pigment manufacturing). Source; BASIC 2022

4. Finished product manufacturing. Many products are manufactured worldwide from the semi-finished products at step 3:
    a. High-quality mica board ends up as an insulation material for electric vehicle batteries.
    b. Pearlescent pigments end up in paints and coatings, as well as cosmetics (including nail enamel, eyeshadow, and lipstick).
    c. Paints containing pearlescent pigments end up on the surfaces of automobiles.
    d. Low-quality mica powder/filler is used in paint, and high-quality filler goes into eyeshadow.
    e. Low-quality mica powder/filler is mixed in with other substances to produce bituminous sheets, which dampen the effect of sound and vibration inside a vehicle.

    Based on a study of profits as reported in company financial reporting,[67] we make the following assumptions about the margins of companies:

[67] These numbers are based on the references given in the section entitled "Bibliography – Company profits."

→ Cosmetics companies make a 14% margin (concerns lipstick, nail enamel, and eyeshadow)

→ OEMs make an 11% margin (concerns thermal cars and electric vehicles)

→ Paints manufacturers make a 12% margin (concerns OEM refinish paint, DIY architectural interior/exterior paint, and DIY anti-corrosion paint)

Once again, the value-add by finished products manufacturing dwarfs the value at the previous stage: taking eyeshadow (before retail) as an example, the finished goods manufacturing stage represents 98% of the value added.

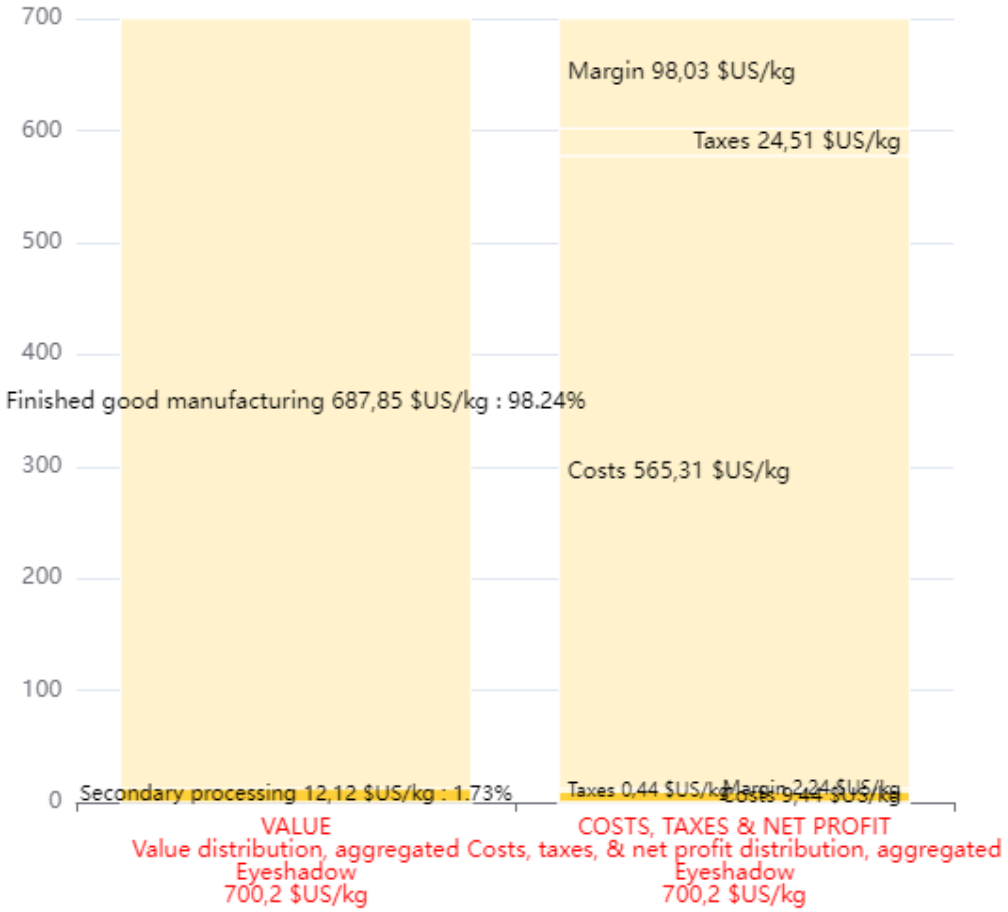


Figure 22. Value distribution for eyeshadow, finished product manufacturing stage. Source: BASIC 2022

5. Retail. The final step in the chain is when the finished product reaches the end-user. Finished products in our model are the following: cars; eyeshadows, nail enamels, and lipsticks; and non-OEM paints and coatings (anti-corrosion, DIY interior/exterior for example). We make the hypothesis that the price from finished product to retail doubles, and that there is a 20% Value Added Tax.[68] Again, the value added at the retail level is larger than the finished product manufacturing stage, and all other prior stages in the chain are barely visible.

[68] For an explanation of this working hypothesis, refer to Annex 1: Modelling methodology.

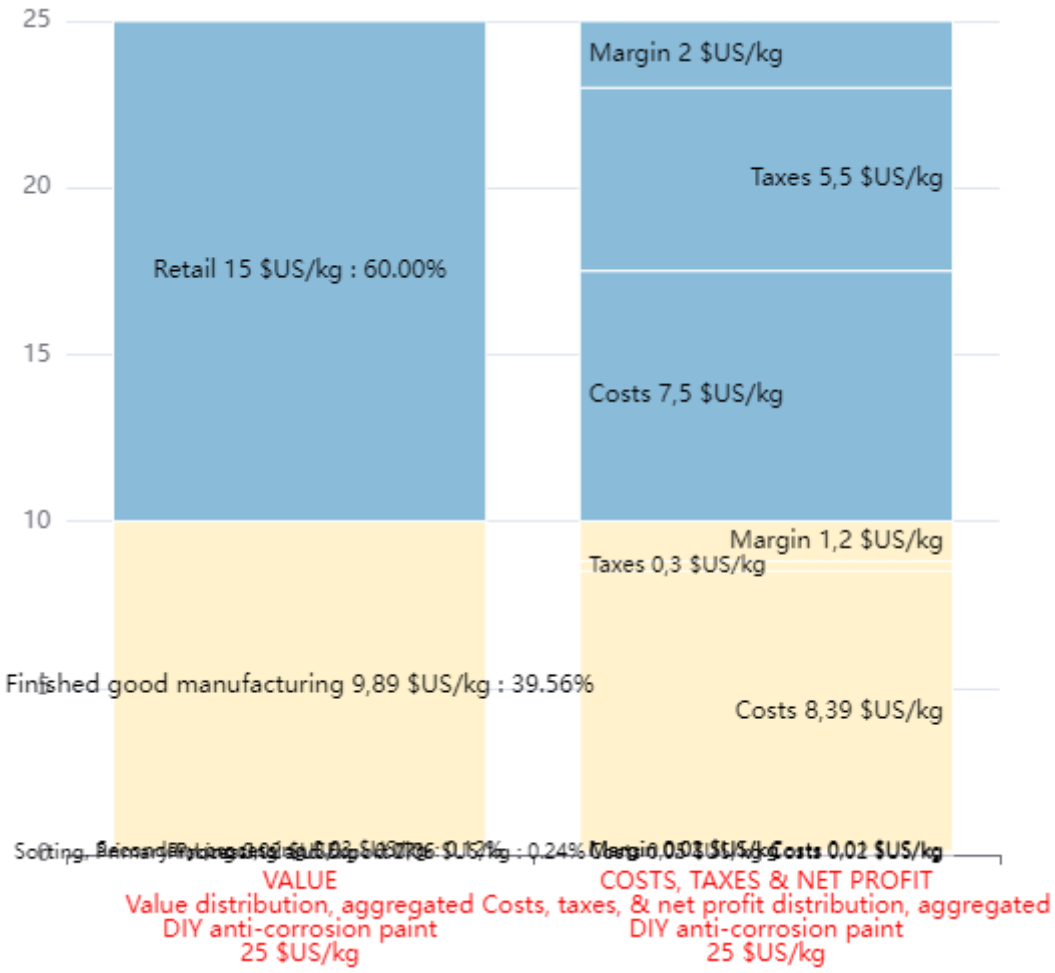


Figure 23. Value distribution for DIY anti-corrosion paint, retail level. Source: BASIC 2022

2.5.2. Mica in the paints and coatings value chain

This subsection explores in greater detail the role of mica in paints and coatings. Mica is used in paints and coatings in two main forms: mica filler and mica-based pigments. As a filler, i.e. as plain mica powder, mica improves the quality of paint:

> "Mica acts as a reinforcing pigment to reduce checking and cracking while at the same time controls chalking in outside latex, oleo resinous, alkyd, and alkyd-modified latex exterior paints. [Mica] mechanically strengthens the paint layer and gives greater resistance to electricity, heat, light, moisture and chemicals. Overlapping layers of mica form a hard shield, which improves the overall durability of the paint."[69]

As a filler, mica can represent 0 to 30% of the formula, depending on the final use.[70]

Mica is also used as a substrate for pigments. Concretely speaking, to make pigments, mica is ground to a very fine powder whose components are like microscopic platelets. The mica platelets are then

[69] Continental Trade, "Paints," n.d., https://www.continentaltrade.com.pl/paints-612
[70] BASIC email correspondence with mica sector expert, 6 May 2022

treated through a complex series of industrial operations, by the end of which they are covered with any number of substances – typically titanium dioxide (TiO_2) or iron oxides or a mixture of both.

There are several different categories of pigments that emerge from this process, depending on the technology used. We identified four typical categories and named them as such in the model. They are, in increasing order of complexity and cost:

1. Silver-white pigments: platelets coated in a thin layer of TiO_2 which appear silver – first image in Figure 24 below;
2. TiO_2 coloured pigments: platelets coated with successively thicker layers of TiO_2 which take on coloured tones – first image in Figure 24 below;
3. Metallic pigment: platelets coated in iron oxides which take on golden-metallic tones – second image in Figure 24 below;
4. Multilayer pigment: platelets coated in a combination of these coatings which take on spectacular iridescent properties – third image in Figure 24 below.

These pigments are mixed into paints to give them their colour. It is estimated that mica-based pigments make up 0.1% to 3% of any given paint, depending on the sought-after effect. This number can increase if the paint in question is sold as a concentrate.

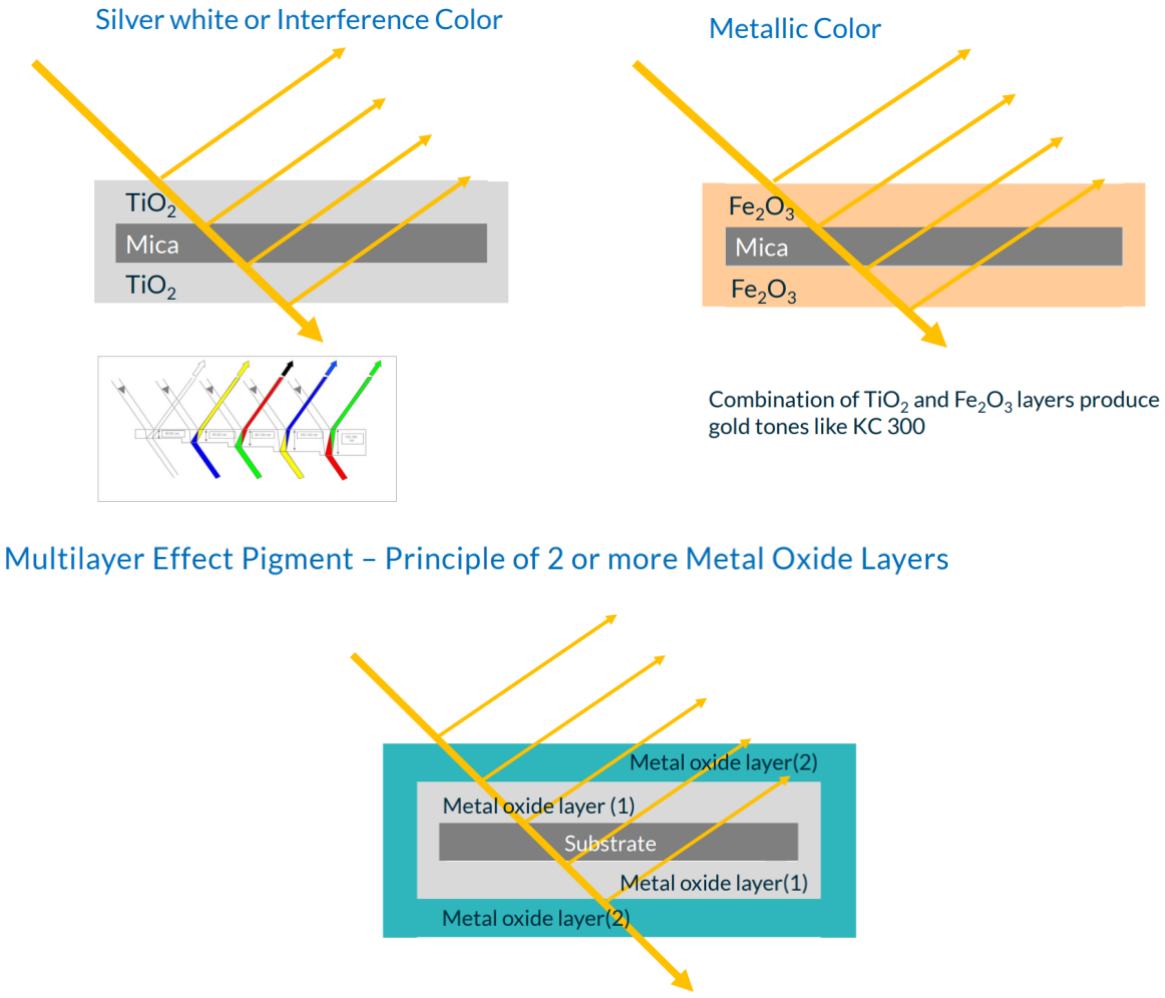


Figure 24. Illustration of how different oxides surrounding mica produce different pearlescent pigments. Source: image courtesy of Kuncai, Global Corporate Presentation 2022

It should be noted that there are some additional challenges, and thus different industrial processes, that are particular to individual segments of the paints and coatings industry. For instance, pigments destined to go outdoors need to undergo a waterproofing treatment – this is for instance one of the steps in manufacturing pigments for OEMs. The car industry also needs pigments that will last a very long time and resist to UV radiation, extreme temperatures, moisture, etc. Pigments must also display a high batch-to-batch consistency. In addition, vehicles must be coated with a treatment to prevent an explosive reaction during the stage where pigments are sprayed onto the car. This step, called passivation, adds a cost to the production process. To deal with this complexity, it is common for the coatings section of an OEM factory to be staffed with employees of the coatings company.

There are further challenges in other categories: for OEM refinish the paint must exactly match the colour of the original, making this one of the most challenging markets. Meanwhile, pigments destined for the cosmetics industry have no such need for stability or replicability over time, but they face extremely exacting standards for purity that are defined in regulation (no quartz dust, no microbial activity, no heavy metals, nano TiO_2 presence must be declared on the label in some countries…).

The value-add in the paints and coatings business is significant. This is already visible at the pigments stage, which is an intermediate product from the standpoint of paints and coatings manufacturers. Indeed, where the mica entering the manufacturing process typically costs less than 1 USD per kg, the output (pigments) begins at 7 USD/kg for the lowest-quality silver-white pigments and goes all the way up to 90 US/kg on average for multilayer/specialty cosmetics pigments. As a result, the value chain distribution of pigments shows that the pigments manufacturing stage dwarfing all upstream stages: see Figure 25 below as an example.

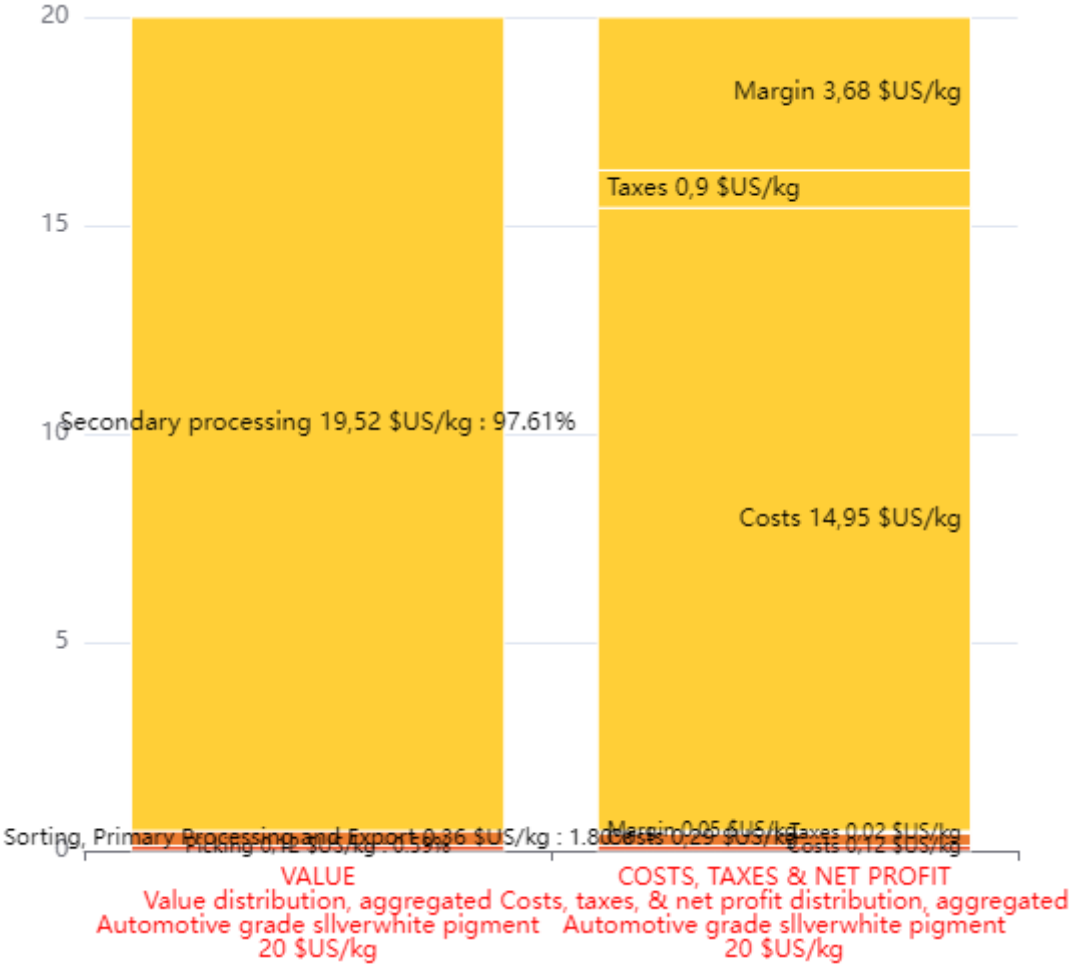


Figure 25. Example of a value-add diagram in the pigments industry: the case of automotive grade silverwhite pigment. Source: BASIC, 2022

However, the value chain does not stop at pigments: it goes all the way to paints and coatings that use these pigments. For the purposes of the model, we focused on a few categories of paints and coatings: architectural paints (interior/exterior) as they represent the majority of the market[71]; OEM and OEM refinish coating, as they are central to the mica content in cars; and anti-corrosion, as the latter has high quantities of mica filler.[72] In the below example of interior/exterior paint, the retail value of 18.5 USD/kg is largely comprised of the retailer's cut (60%), followed by the manufacturer (38%); the stage where pigments are manufactured is only 2.2% of the final price; less than 0.5% of the value is added from India (mining, primary and secondary sorting, and primary processing and export).

[71] Fortune Business Insights, "Paints and Coatings Market Size, Share & COVID-19 Impact Analysis," April 2022
[72] BASIC interview with paints sector expert, 11 May 2022

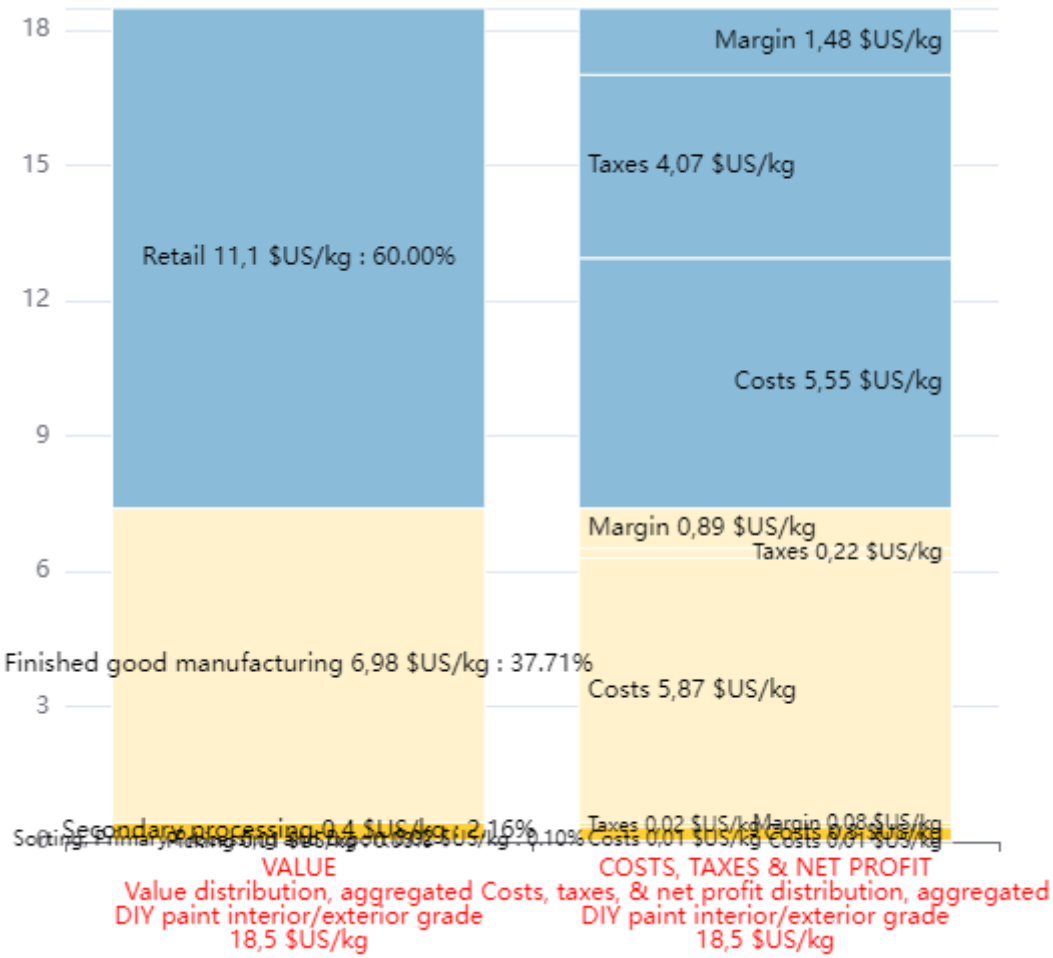


Figure 26. Example of a value-add diagram in the paints and coatings industry: the case of interior/exterior architectural grade paint. Source: BASIC, 2022

2.5.3. Mica in the cosmetics value chain

This subsection explores in greater detail the role of mica in cosmetics. As noted above, mica is an important component of some cosmetics products, in particular lipstick, eyeshadow, and nail enamel. It enters the cosmetics value chain at the level of pigments: pigments and powder intended for cosmetics are the most expensive grade on the market. In lipstick and eyeshadow, ultra-high-quality mica powder is used as a filler (there is no filler in nail enamel). Mica is also used in all three products in the form of pearlescent pigments, which give lipstick, eyeshadow, and nail enamel their iridescent qualities. Mica powder and pigments used for cosmetics must conform to strict regulations concerning the absence of impurities, heavy metals, or microbial activity.

These specifications, and the high quality of the pigments used, make cosmetics a very high value-add type of product. To give the example of eyeshadow, illustrated below in Figure 27: by weight (as a % of total value of around 1,900 USD per kg of eyeshadow), retail captures approximately 60% of the value added, finished goods manufacturing captures just under 40%, and everything upstream (including pigments) represents the remainder, around 0.65%.

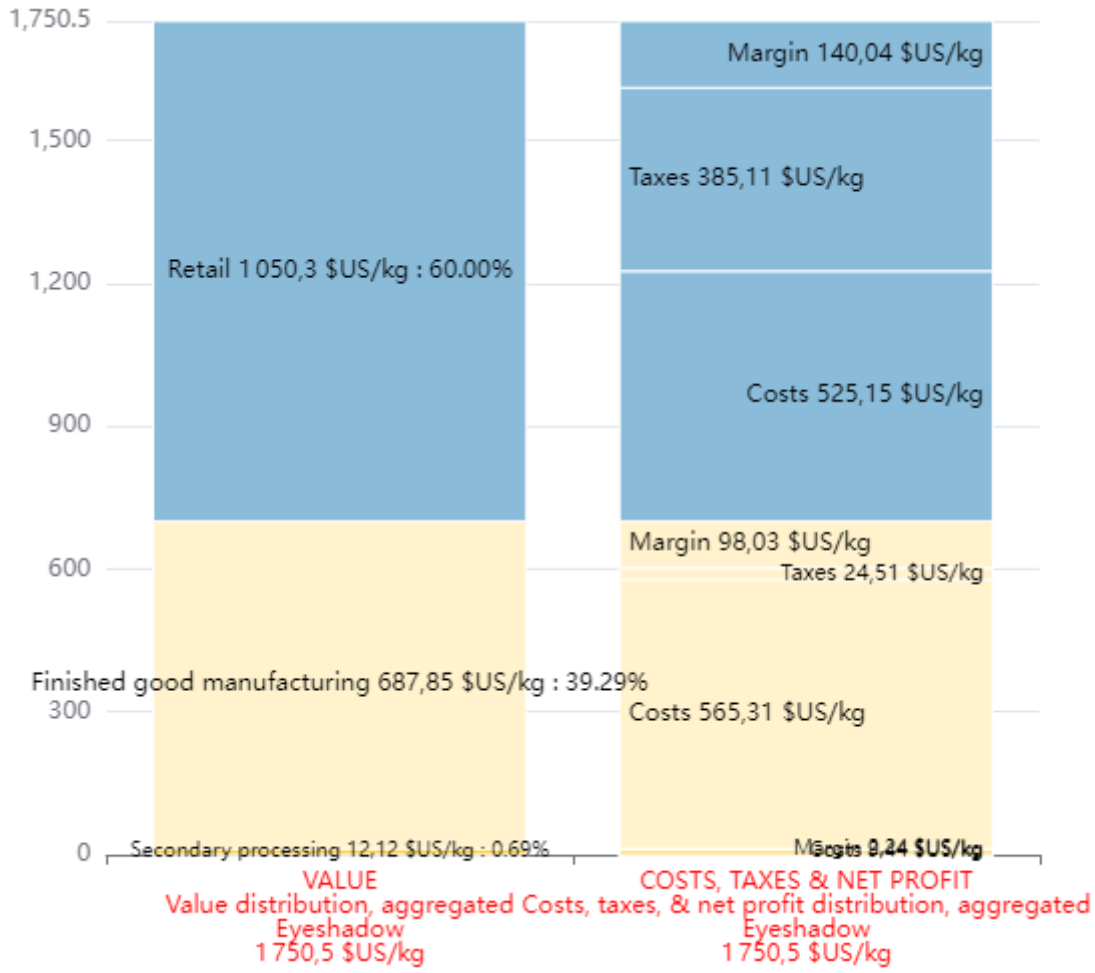


Figure 27. Example of a value-add diagram in the cosmetics industry: the case of eyeshadow. Source: BASIC, 2022

2.5.4. Mica in the automotive value chain

This subsection explores in greater detail the role of mica in automobiles. For this study, we are mandated to focus on mica in cars *other than* the mica used in electronics. Instead, we identified some of the parts of cars that contain the most mica: specifically, the mica in paints and coatings, the mica in droning insulation (insulation against vibration and noise), and the mica used to house and insulate batteries in electric vehicles.

- Coatings: for information on how mica is used in paints and coatings as well as the requirements for OEM and OEM refinish paints (see the section 2.5.2 above on mica in the paints and coatings value chain). It is estimated that in a single car there is about 100g of mica: 2% of paint is mica-based pigment, out of 5kg of paint per car.
- Droning insulation: droning insulation takes the form of bituminous sheets that are attached to the steel armature of the car to convert kinetic energy into thermal energy, thereby damping the sound and vibration disturbance to car passengers. The exact quantity of droning insulation in cars is unclear; there may be between 400g and 6 kg, depending on the estimate.

- Electric vehicle battery insulation: to prevent thermal runaway[73] in electric vehicle batteries, mica paper/board is used to insulate individual fuel cells from each other, and to insulate the totality of the battery from the remainder of the parts of the car. Mica's ability to resist and thus compartmentalise sources of heat becomes incredibly helpful here. The quantity of mica used varies greatly depending on the nature of the vehicle. According to our research, hybrids start at around 500g mica insulation per car; full electric starts at 1.5 or 2kg of mica but can go up to 8, 10, or even 15 kg for heavy-duty vehicles. This technology is very new.

These three components have different profiles in terms of value distribution.

- The products that concentrate the greatest value downstream are paints and coatings: out of the approximately 350 USD per kg sales price of OEM paints, about 0.2% of the value comes from upstream.
- Things are marginally more moderate for droning insulation: the insulation itself costs approximately 3.42 USD/kg as manufactured from mica powder that costs 0.18 USD/kg (5.2% of the total).
- Meanwhile, things are most balanced for EV batteries: a battery sells for approximately 11.5 USD/kg (5,750 USD for 500 kg), while the upstream component (mica mining-first transformation-export-manufacturing as board) costs about 3.25 USD.

[73] As explained in an article by OEM provider Tapecon, "Thermal runaway (or TR, for short) is a phenomenon that can affect rechargeable energy storage systems, including lithium-ion (Li-ion) batteries and valve-regulated acid (VRLA) batteries. The dangerous condition occurs when the temperature rapidly rises inside one of the battery cells. The excess heat combined with lower internal resistance to the charging current enables the temperature to rise quickly even further and affect other cells. This pattern will repeat until the battery is removed or fails – hence the "runaway" of thermal runaway," In terms of risk to the user, "Once the thermal runaway process begins, it is very unlikely that the condition will stop on its own. If the temperature increases and isn't effectively dispelled, the inevitable result will be the battery overheating. The heat will cause significant damage to the battery and its compartment. In some cases, the battery may leak toxic chemicals or gas. Beyond battery damage, thermal runaway poses severe risks to the product's users and surroundings, including sudden system failure and dangerous events such as fire or explosions. While traditional combustion vehicles can also experience these hazardous situations, fires with EVs can be more extreme," Tapecon, "Understanding Thermal Runaway, and solutions for designing safer batteries," n.d., http://www.tinyurl.com/22k54sxb

3. Scenarios for change

The present study aims to support the RMI and its members in decision-making by building a comprehensive quantitative model of the scrap mica value chain, from mine to finished product. The model, in its basic configuration, maps the status quo. However, it also enables evaluation of three scenarios for a possible future that protects the human rights of mica pickers and their children. The model is hosted on a web-based platform,[74] where it is possible to toggle several scenarios, each of which is more ambitious than the previous in terms of human rights protections.

Throughout the value chain, the quality of mica appears to dictate the price of the products derived from it. However, value accumulation is such that by the time semi-finished or finished products are ready for sale, the contribution of raw mica – high or low quality – to the price of the final good is infinitesimal. This is why RMI commissioned BASIC to build a quantitative model of the mica value chain that can be used to explore possible scenarios, possible futures in which mica workers are better paid, and see how this increase in costs upstream of the chain can be equitably dispatched across the multiple downstream stakeholders of the value chain. In this section we will review the objective of a living wage, and three potential scenarios that could, in the future, significantly alter the mica value chain. Each scenario is presented along with its main hypotheses and inputs, as well as the major conclusions from each.

3.1. Background: the objective of a living income

RMI is convinced that to reach its goals of child labour free and responsible supply chains, mica value chains delivering a living income to workers in the mica sector would be a decisive enabler, with a particular focus on vulnerable categories of people, such as mica pickers and factory workers. Paying a living income or living wages to upstream mica pickers and workers becomes hence another objective of the RMI. Our focus in this study is on the scrap mica value chain, materialised in the form of mica picking by mica pickers; new digging and mining by mica miners is outside the scope of the study.

One of the working assumptions is that as incomes increase for adults, there is less of a need for families to send their children to work in mica picking. This is why all of the scenarios below include an increase in income for mica pickers and factory workers. However, higher incomes may be not sufficient, for instance in the case of villages where schools are remote. More of an effort needs to be made to support families holistically – with healthcare, childcare, and education services, for instance – in order for an increased income to really make a difference. Hence, the most ambitious of the three scenarios, the cooperatives scenario, includes provisions that could be made for childcare (using the worker welfare fund) and, implicitly, improved picker/worker knowledge of and access to government services once the mica pickers' activity is legalised.

The scenarios are the following:

[74] http://micavaluechain.lebasic.com/

1. Current state value chain is the status quo: the value chain starts with mica pickers receiving 8 Rs/kg from dealers, who sell to aggregators, who sell to processors/exporters. The mica picking activity is mostly illegal.
2. "Scenario 1: Legalisation" explores a world where mica picking is legalised. The government issues permits to processors to pick mica in designated areas. The permit holders arrange for mica collection from the mica pickers through existing mica dealers. Thanks to government oversight, mica pickers' income more than double to reach the minimum wage equivalent. Factory workers also see their wages increase to the legal minimum, which would amount to an approximately 11% increase in their current salary.[75] In this scenario, secondary sorting and aggregating is conducted directly by processors; unless processors choose to rely on them, aggregators are no longer part of the scrap mica value chain.
3. "Scenario 2: Living income" considers a world where all mica workers earn a living income. The basic configuration is the same as in scenario 1: processors bid on mica dumps and arrange for mica picking and collection via existing dealers. However, in this scenario there is a nearly 5 times increase in incomes for mica pickers relative to the status quo (2.5 times more than in scenario 1), and a doubling of income for mica factory workers (2 times more than scenario 1). As in scenario 1, secondary sorting and aggregating is conducted directly by processors; unless processors choose to rely on them, aggregators are no longer part of the scrap mica value chain.
4. "Scenario 3: Cooperatives" posits a world where mica pickers organise themselves to form village-level cooperatives. These cooperatives conduct a first-level sorting of the mica and sell it to the JSMDC, the state level administration for mining, which conducts secondary sorting (typically the role of an aggregator). The mica is then auctioned off. The assumption is made that the JSMDC is able and willing to buy mica at a living-income level, and that JSMDC staff are also paid a living wage. The scenario also includes more ambitious provisions for the social wellbeing of mica picker families.

The three scenarios should be seen as building on one another: Scenario 1, resembling what the JSMDC has done in the past but with an improvement in wages; Scenario 2, which follows Scenario 1 but with more ambitious income targets; and Scenario 3, which is a complete innovation on the current system and appears to be the direction taken by Jharkhand authorities at present.

The status quo and three scenarios have some shared assumptions which are described in the table below.

[75] Responsible Mica Initiative, FairWage Network, Sentio Advisory Initiative, "Report on wages, working and living conditions of Mica workers in India," February 2022

Overarching shared assumptions
• To assess the quantity of mica picked per day, we based ourselves on the Fair Wage Network Living Wage study commissioned by RMI.[76] The study found that mica pickers in Jharkhand pick approximately 20 kg of mica per day, while those in Bihar pick only 11 kg per day, as mines are more remote from their villages. Given that these values are themselves averages, we averaged the two values to obtain the daily mica picking value: **we assume mica pickers pick approximately 15.5 kg/day.** • In the model, both **mica pickers and factory workers work 26 days a month**, as per the Jharkhand State's own definition of work time per month in its minimum wage calculations. • India has a rainy season that lasts four months (from June through September). During this period, mica pickers conduct almost no work at the *dhibra* dumps; however, they may choose to undertake other activities, such as agriculture or running a small shop. **We chose to index income calculations on the eight-month dry season when *dhibra* pickers are at work.** No adjustment was made to cover the "lean period" of four months during the rainy season; income figures calculated below are for an ordinary month/week/day in the dry season. • Were mica to be sold in India, it would be subject to a 5% Goods and Services Tax (GST). However, GST is not owed on items destined for export, so the state would actually reimburse the exporter for any GST that was paid on the mica purchased upstream. However, GST is owed upstream of the chain. We have simplified the simulation by placing **GST as a cost to the processor,** because it is the last in the chain to pay GST before export. • We assume that once the mica value chain enters the fold of legality, this is accompanied by **the appearance of new taxes.**[77] We have identified to date three taxes that the State might levy, but not all of them are likely to be applied. The first tax – a 4% royalty on mining proceeds – is not expected to be paid because it has historically applied only to mica mining permits, not picking permits: the equivalent of royalty in a picking permit is the auction price of mica.[78] Theoretically, companies meeting the net-income threshold would be liable for corporate income tax; however, it is estimated that only one-third of aggregator-processor-exporter firms are liable for this tax, while others are under the threshold: therefore it is not taken into account in the model, which needs to be representative of the majority scenario. The third tax is a transit tax (estimated at 3,000 Rs per ton) that would be paid by the leaseholder.[79] This is included in the three prospective scenarios. The JSMDC also levies a special auction tax on mica at auctio in Scenario 3.

[76] Responsible Mica Initiative, FairWage Network, Sentio Advisory Initiative, "Report on wages, working and living conditions of Mica workers in India," February 2022; BASIC Interview with mica sector expert, November 2022.
[77] Responsible Mica Initiative and FTI consulting, "Jharkhand Sustainable Mica Policy Framework and Vision," July 2020; International Seabed Authority, and RMG Consulting. "Analysis of Tax Regimes: Comparative Analysis in 15 Countries," 12 October 2020; Better World Foundation, "Designing Innovative and Holistic Community Based Business Models for Mica Pickers in Coherence and Adherence with the Policy," n.d. (after 2020).
[78] BASIC interviews and correspondence with mica sector experts, discussing the 4% royalty rate for mica mining, 2022
[79] Better World Foundation, "Designing Innovative and Holistic Community Based Business Models for Mica Pickers in Coherence and Adherence with the Policy," n.d. (after 2020)

DISCLAIMER: The current-state value chain is constituted as: mica picker → dealer → aggregator → processor. It should be underlined this model approximates reality to the best of our ability, but the reality in the field may be more complex. In particular, some actors may be in a state of quasi-vertical integration while others have much looser ties with their suppliers and clients.

This should be borne in mind when examining the adjustments made to the value chain in the scenarios below. The adjustments reconfigure certain relationships: in scenarios 1 and 2, the role of aggregators becomes ambiguous (they potentially disappear), and in scenario 3, both dealers and aggregators potentially disappear entirely. Our model incorporates these changes, but it should be underlined that it is a simplification of reality and a prospective exercise, not a prediction for the future. In particular, the boundaries between dealer-aggregator-processor-exporter are not necessarily hard and fast, and existing actors will likely seek – and perhaps succeed – in securing a role for themselves even in a scenario where their current position hypothetically disappears.

3.2. Scenario 1: Legalisation

3.2.1. Description

The legalisation scenario is based on the notion that State authorities – in India, the Jharkhand State Mineral Development Corporation (JSMDC) – issues licenses to pick from geographically demarcated *dhibra* dumps. This brings mica picking into the fold of legality, with several benefits. For the State, mica picking becomes a source of revenue that is also under loose government supervision. For mica pickers and for factory workers, state supervision leads to higher incomes/wages – the minimum wage is paid – and greater control of their working conditions.

This scenario tracks closely with what the JSMDC has done in the past. Namely, in this scenario the Department of Mining and Geology catalogues the existing *dhibra* dumps and appraises their value (size, mica quality, etc.). Then, the JSMDC organises auctions to the highest bidder to exploit *dhibra* dumps legally, at a starting price that is based on an appraisal of the mica content and value in the dump.

Scenario 1 assumes that the JSMDC will renew such auctions in the future, but that there will be stricter control over payment to mica pickers. The modelling tool assumes that it is typically processors who will bid on *dhibra* dumps. Processors will also take on the secondary sorting and aggregating function that was previously the remit of aggregators, potentially by staffing this task themselves instead of relying on existing aggregators.

In addition, it is implicit in this scenario that there is greater government oversight on these stakeholders. Specifically, the model assumes that by being brought into the fold of legality, pickers will begin to receive the equivalent of Jharkhand state-level minimum wage for unskilled labour, with an additional bonus for higher quality of mica.

The legalisation scenario has several advantages. First, mica pickers would be guaranteed a minimum income equivalent to the minimum wage for unskilled workers. Factory workers would also benefit from a legal minimum wage. In addition, mica picking becomes legalised. This offers a better,

more stable business environment for processors and exporters. For the State, legalisation offers a source of taxes that are to be paid to the government (see inset below).

3.2.2. Assumptions and key numbers

The below table explains the values inputted into the default configuration of the model for Scenario 1.

The numbers: Scenario 1
• Picker incomes/Mica price: Minimum wage for unskilled labour in Jharkhand is, as of April 2022, 326.86 Rs per day. On the assumption that daily mica collection is around 15.5kg/day, this means that mica pickers would be paid approximately 21 Rs/kg, i.e. around two and a half times what they currently make. This is the minimum price that would be guaranteed for pickers, but as in all scenarios, mica of greater quality would receive a premium. In addition, is it estimated that mica pickers require Personal Protective Equipment (shoes, masks, and gloves): a little more than 3 Rs/kg is allocated to PPE as a cost of doing business for miners, bringing the total price of mica to 24.17 Rs/kg. • Mica factory workers: the salary of mica factory workers rises slightly (approximately 11%, from 8 032 Rs/month paid today to 8 903 Rs/month minimum wage).[80] We assume that mica sorters working for processors will also earn minimum wage; this increases costs at the aggregation stage. • Costs: The increase in mica price (picker incomes) and factory workers' wages entails an increase in costs for downstream stakeholders. In addition, the license holder must pay a set price for each kg of raw matter at the dump at the time of auction. This price is assessed by the Department of Mining and Geology in coordination with the JSMDC; it has previously stood at around 2 Rs/kg for the dump material (entire dump including mica scrap but also sand, stones, dust, biotite…). If the contents of a *dhibra* dump is assessed at 2 Rs/kg at the time of auction and is paid as such by the license holder, then the license holder will need to factor at least 2 Rs/kg to his costs to recoup the value of the picking license. In reality, because the mica dump contains the aforementioned impurities, the effective price of mica is potentially greater than the auction price. • Taxes: As noted above, GST of 5% is charged to the processor, as well as a 3 Rs/kg transit tax.

[80] Currently minimum wage has increased. In the Living Wage study, minimum wage was reported as 8770 Rs/month However, in Oct 2021 semi-skilled MW was 8579.02 Rs/month and in April 2022 semi-skilled MW was 8903.13 Rs/month. We have retained the latter number, as it is more recent.

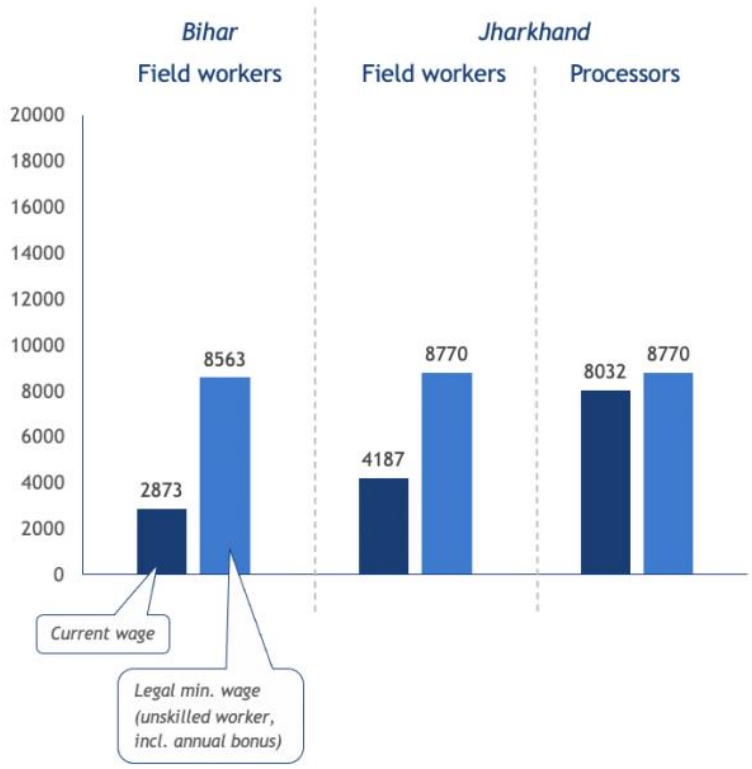


Figure 28. Comparison between current average income and legal minimum income for mica field workers and processors in Bihar and Jharkhand (gross, INR/month, 2021 estimates). Source: RMI/Fair Wage Network Living Wage study

3.2.3. Impact

With mica input at around 24 Rs/kg, the price of mica going into primary processing increases to 0.46 USD/kg. This raises prices between 0.010 to 0.43 USD/kg extra at the primary processing stage. High-quality powder and flakes thus sell for around 1 USD/kg, as against around 0.55 USD/kg in the status quo. Going into pigments, mica ground by pigments manufacturers increases in price; this increases pigments price by approximately 0.18 to 0.33 USD/kg. The price of intermediate products such as OEM grade paint, vehicle droning insulation, mica board (multilayer laminate), and EV batteries also increases mildly.

In terms of finished products, strictly speaking in absolute terms the most impacted product is electric cars (2.21 USD increase per car); however, in relative terms (price increase divided by price) all increases are less than 1% of the finished price and most are less than 0.10%. For this reason, the costs-margins-taxes diagram for finished products is almost identical in the status quo and in Scenario 1, as can be seen in Figure 29 below – taking the example of anti-corrosion paint. The relative value contribution of the upstream part of the chain, other than final manufacturing and retail, is negligible.

NOTE: Value distribution graphs given in Section 3 are screenshots to illustrate results. For better resolution, we recommend using the online platform: when you click on an item in a rectangle, the two bar charts appear – the current scenario's chart on top, and the status quo chart below.

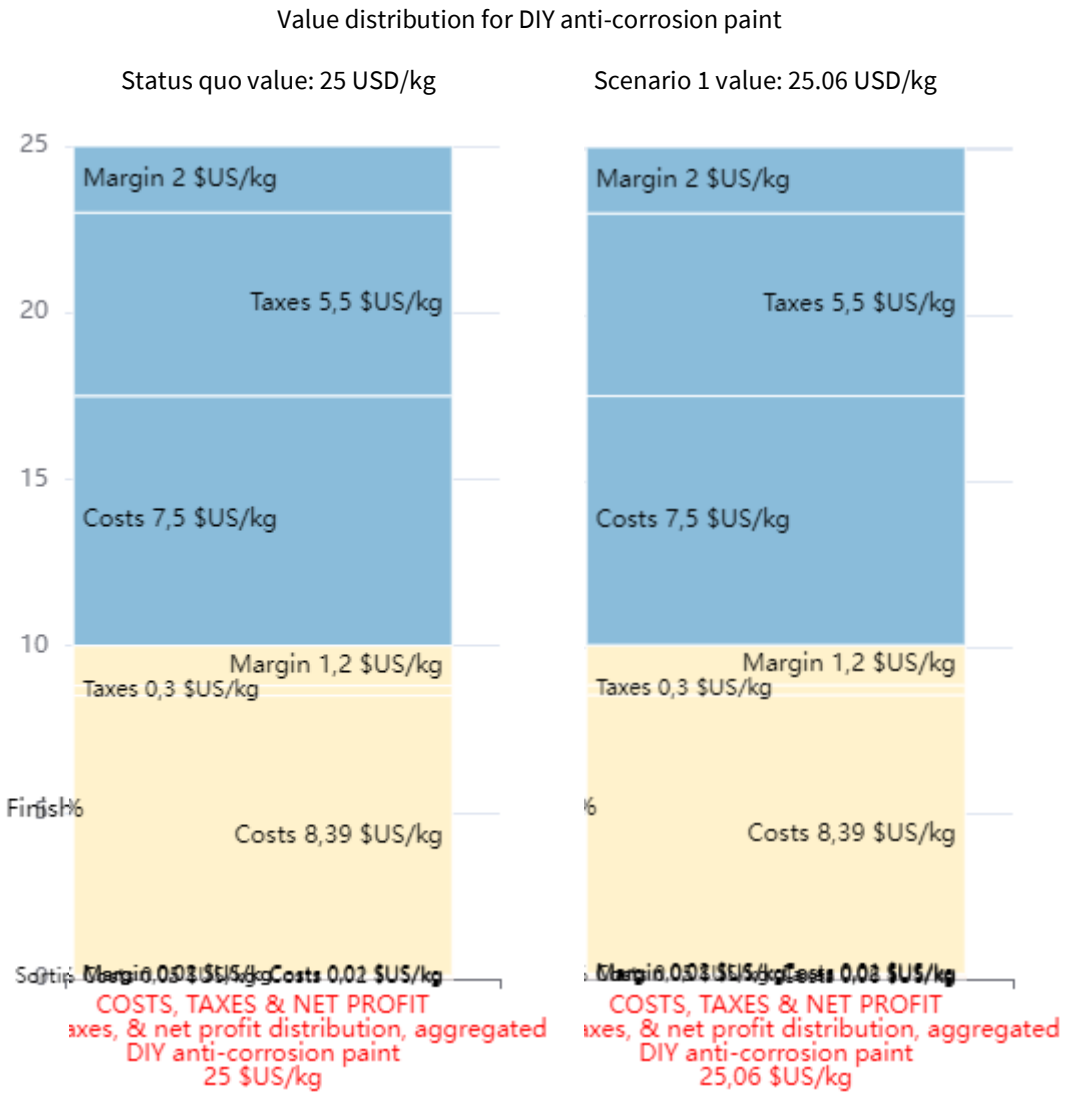


Figure 29. Value distribution for DIY anti-corrosion paint, status quo vs. Scenario 1. Source: BASIC, 2022

Only when semi-finished products are examined does the value distribution change appear more clearly. This can be seen, for instance, in the case of low grade silverwhite pigment. Although the cost of secondary processing does not change significantly, the part of the value captured by mica pickers and workers, in red and orange, is greater in the Scenario 1 diagram than the status quo – see Figure 30 below.

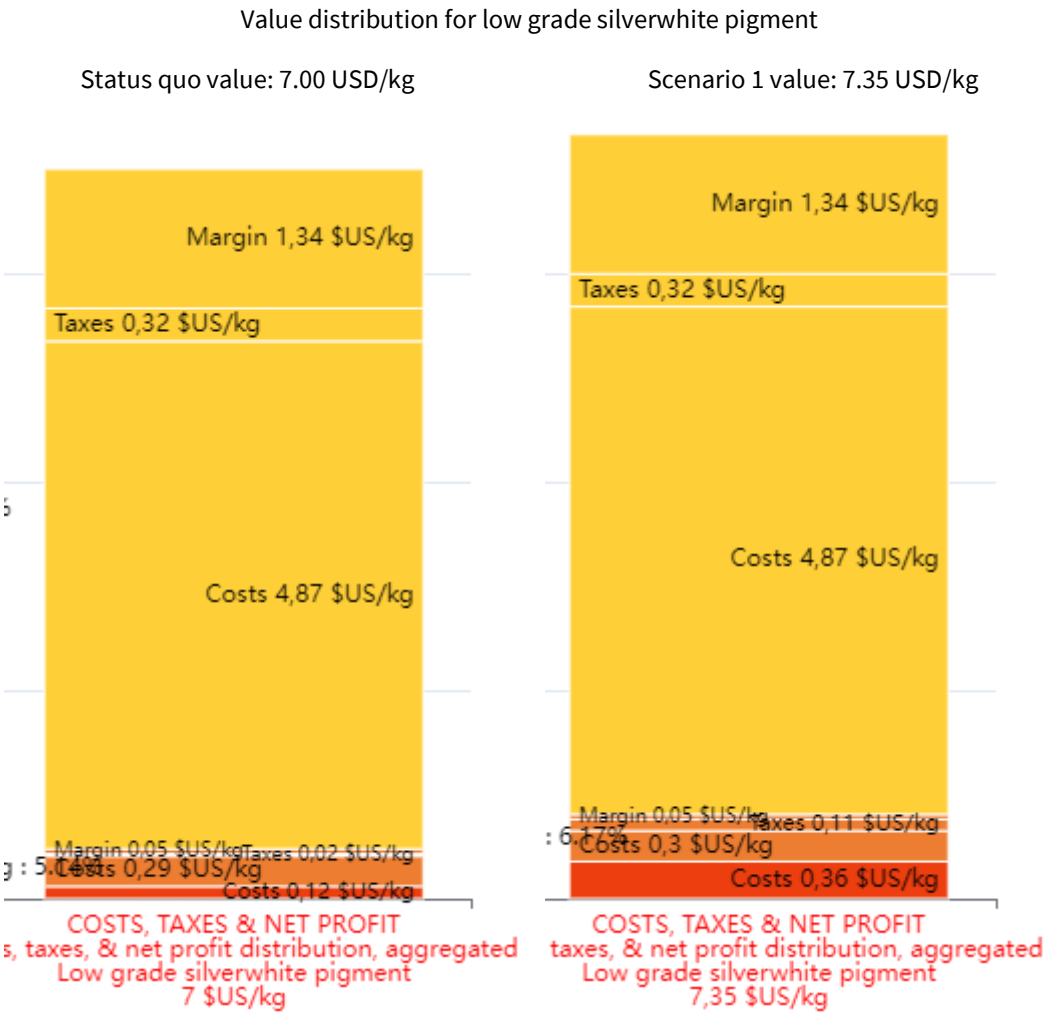


Figure 30. Value distribution for low grade silverwhite pigments, status quo and Scenario 1.

3.3. Scenario 2: Living income

3.3.1. Description

In scenario 2, the basic configuration is the same as Scenario 1. However, pickers and factory workers receive a living income/wage. This is a more ambitious scenario that very likely requires a coordinated approach between upstream and mid-stream stakeholders to reach an agreement in terms of the redistribution of extra cost down the chain, for major players. Without such an agreement, buyers may try to identify alternate sources of mica that are cheaper than that delivered by living-wage consortium stakeholders. However, Scenario 2, like Scenario 3 below, is believed to be more impactful on child labour, as wages reach the point when it is no longer necessary to supplement family income with income from child labour.

3.3.2. Assumptions and key numbers

The below table explains the values inputted into the default configuration of the model for Scenario 2.

The numbers: Scenario 2
• Pickers incomes/Mica price: For mica pickers, a living income is approximately 15,000 Rs/month, or 577 Rs/day for 26 days of work a month. However, they continue to receive payment based on mica quantity and quality. Brough back to the average of 15.5 kg collected per day, with a living income workers receive 37 Rs/kg for their mica, i.e. approximately 4.5 times what they are currently paid (8 Rs/kg). In addition, is it estimated that mica pickers require Personal Protective Equipment (shoes, masks, and gloves): a little more than 3 Rs/kg is allocated to PPE as a cost of doing business for miners, bringing the total price paid to pickers to 40.17 Rs/kg. • Mica factory workers: For a mica factory worker, the part of family income that is salary from the mica factory increases by about 80%, from 8,032 Rs/month to 14,652 Rs/month. • Costs: The increase in mica price (picker incomes) and factory worker wages entails an increase in costs for downstream stakeholders, such as dealers and processors, in the form of wages as detailed above in scenario 1. Also, as in the above, the picking license holder must also pay the price of the license at around 2 Rs/kg. • Taxes: As noted above, GST of 5% is charged to the processor, as well as a 3 Rs/kg transit tax.

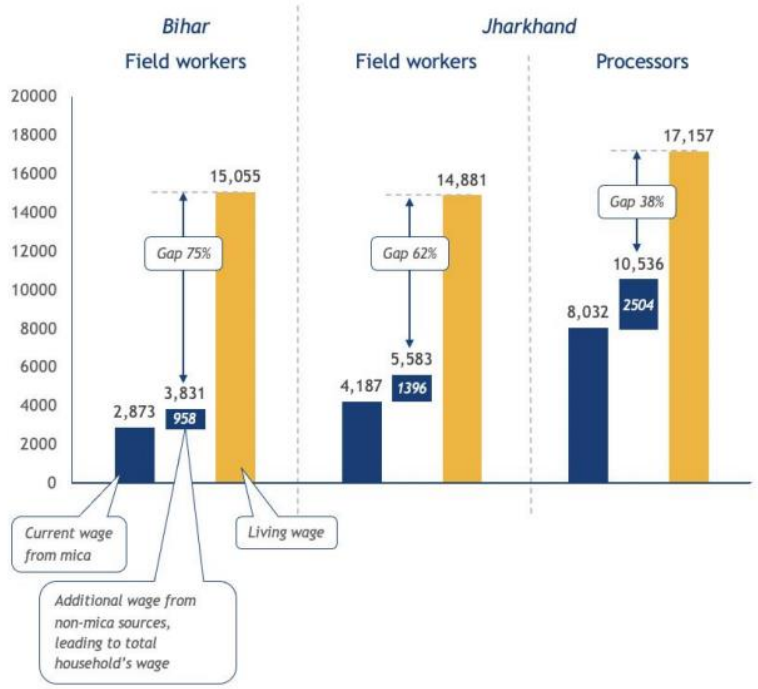


Figure 31. Total income from mica and non-mica activities earned by the whole household, compared to the household living income, for mica field workers and processors in Bihar and Jharkhand (gross, INR/month, 2021 estimates). Source: RMI/Fair Wage Network Living Wage study

3.3.3. Impact

With mica input at just over 40 Rs/kg, the price of mica going into primary processing increases to 0.70 USD/kg. This raises the price by around between 0.19 to 0.86 USD/kg extra at the primary processing stage. High-quality powder and flakes thus sell for around 1.50 USD/kg, as against around 0.55 USD/kg in the status quo. Going into pigments, mica ground by pigments manufacturers increases in price; this increases pigments price by 0.36 to 0.66 USD/kg. The price of intermediate products such as OEM grade paint, vehicle droning insulation, mica board (multilayer laminate), and EV batteries also increases.

In terms of finished products, strictly speaking in absolute terms the most impacted product is once again electric cars (4.42 USD price increase per car); however, in relative terms (price increase divided by price) all increases are less than 1% of the finished price and most are less than 0.1%. For this reason, the costs-margins-taxes diagram for finished products is almost identical in the status quo and in Scenario 2, as can be seen in Figure 32 below – taking once again the example of DIY anti-corrosion paint. The relative value contribution of the upstream part of the chain, other than final manufacturing and retail, is negligible.

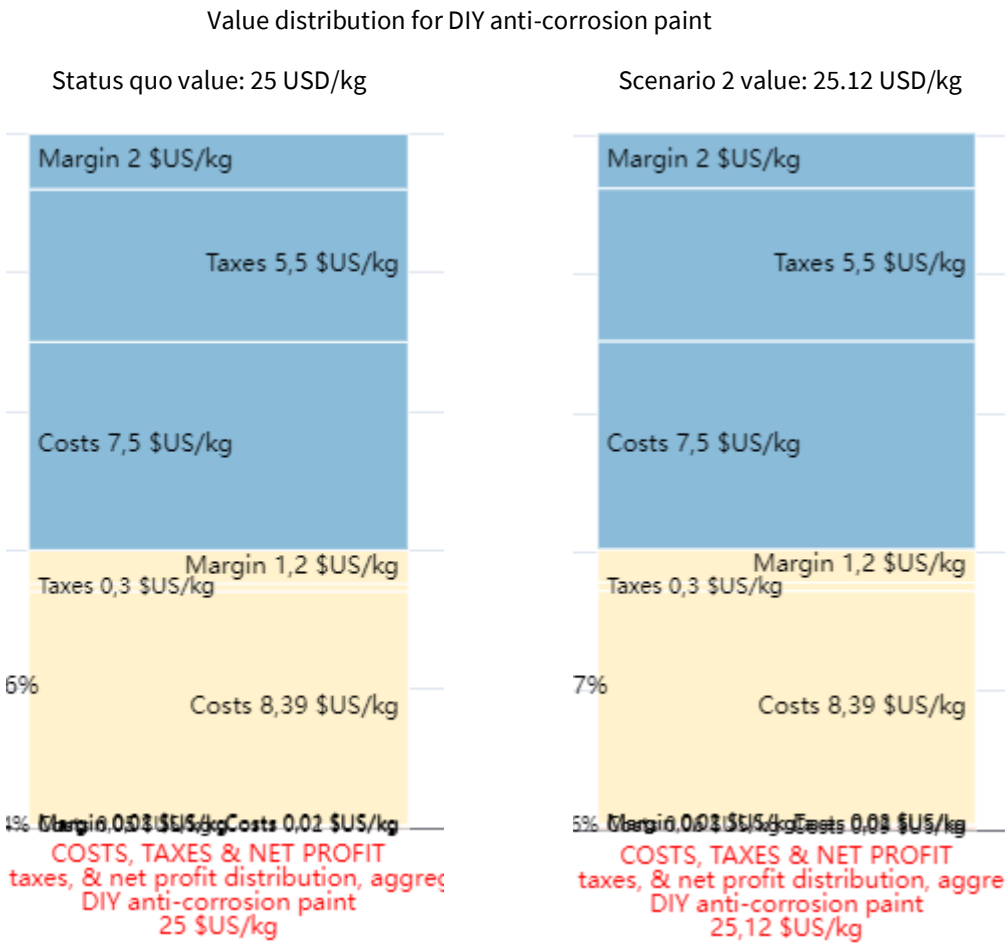


Figure 32. Value distribution for DIY anti-corrosion paint, status quo vs. Scenario 2. Source: BASIC, 2022

As in Scenario 1, only when semi-finished products are examined does the value distribution change appear more clearly. This can be seen, for instance, in the case of low grade silverwhite pigments.

Although the cost of secondary processing does not change, the part of the value captured by mica pickers and workers, in red and orange, is greater in the Scenario 2 diagram than the status quo – see Figure 33 below.

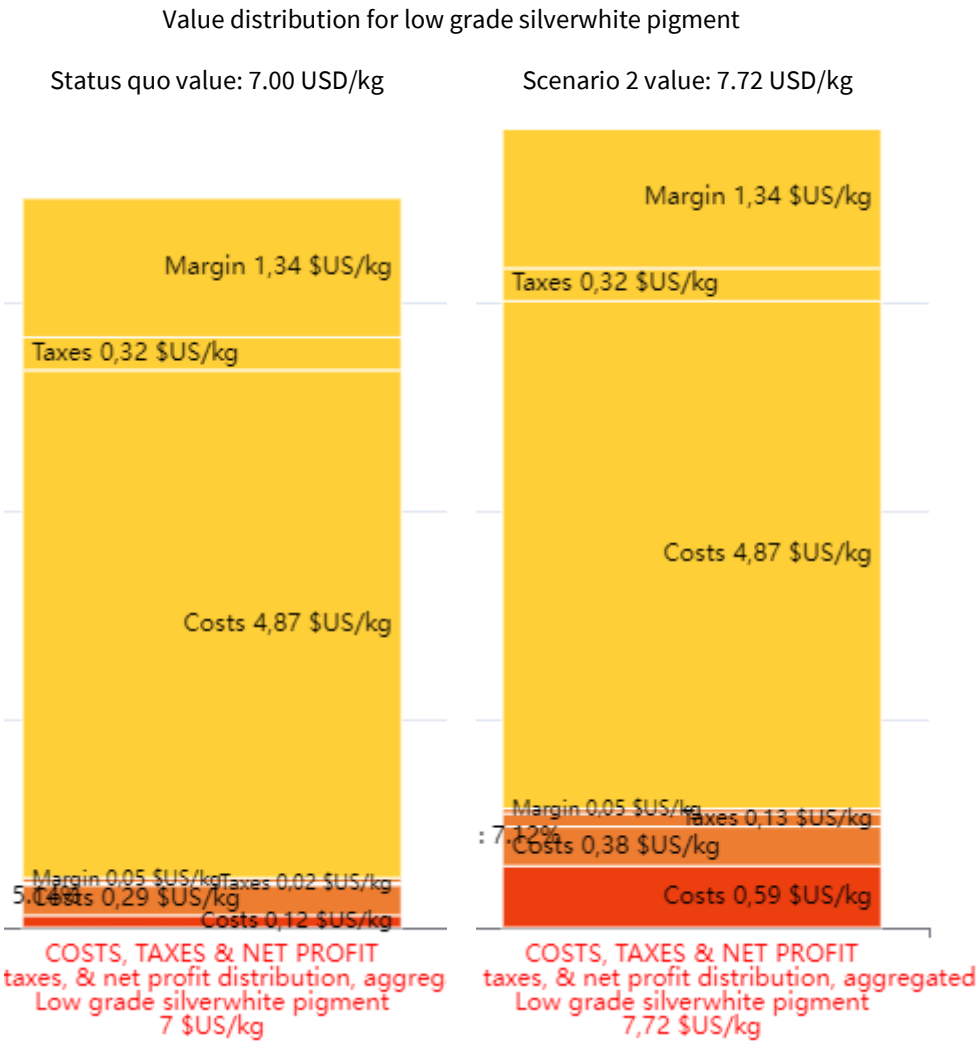


Figure 33. Value distribution for low grade silverwhite pigment, status quo and Scenario 2.

3.4. Scenario 3: Cooperatives

3.4.1. Description

Scenario 3 is the most advanced and ambitious of the three scenarios, both in terms of its political complexity and in terms of the gains in social justice attained. In Scenario 3, villages form Community Based Organisations (CBOs), i.e. cooperatives. The cooperatives are quite large: they bring together 10 to 15 villages of approximately 40 mica pickers each, for a total of 5,000 members. While the cooperative has representatives at the village level, the core of activity focuses around the Village

Collection Centre (VCC), which aggregates output from these 10 to 15 villages. Output is considerable; approximately 7,750 kg mica per day, i.e. 201,500 kg/month and 1,612,000 kg per 8-month year.[81]

In the cooperative scenario, all mica pickers are registered members. The cooperative coordinates the work of mica pickers, ensures that good working conditions are in place, distributes PPE, spot-checks for child labour, and pays mica pickers a fixed price per kg with a quality bonus. Employees at the VCC – about 15 of them per cooperative – do a preliminary sorting of the mica. Cooperatives sell the mica to the JSMDC, which collects the mica and then conducts additional sorting and screening with the help of about 20 workers at the District Collection Center (DCC). The JSMDC then puts the mica up for sale, in an auction format. Ideally, mica pickers are paid a living income by the cooperative, which sets prices for mica; factory workers also continue to receive a living wage as under Scenario 2.

From an administrative standpoint, Scenario 3 is more ambitious than the other two. Mica pickers are issued registration cards and are invited to open banking accounts; wages are paid by the cooperative into this account.[82] The cooperative, in turn, is paid by JSMDC, which pays for the mica based on the account of wages disbursed by the cooperative. Movement of mica from picking site to village to VCC can be done only with a valid authorization issued by JSMDC. At the next stage, trucks carrying mica from village to district level storage places would be outfitted with GPS trackers to increase accountability. The setup is such that in theory, additional efforts can be made towards traceability, such as linking every bag of mica that enters the processing stream to one mica picking village of origin.

Like Scenario 2, Scenario 3 is interesting from the standpoint of child labour, as living incomes/wages are paid and the mica can be traceable. The scenario also includes more ambitious provisions for the social wellbeing of mica picker families. For instance, the JSMDC envisages collecting tax of approximately 5% on the price obtained for the mica dump at auction. A little under half of this tax (1% or 2%) would be given back to the cooperative. The cooperative is then free to use this money in the most relevant ways so as to improve the general welfare, for urgent priorities such as mine safety, education, healthcare, water, and sanitation.[83] As concerns child labour, the cooperative could use its funds for projects that increase school attendance, such as by covering fees for school and school meals, or by giving children in remote villages the means to go to school (bicycles, for instance). Money could also be allocated to childcare, to ease the burden on school-age children for watching over their younger siblings.

3.4.2. Assumptions and key numbers

[81] BASIC Interviews with RMI staff, September – October 2022; Better World Foundation, "Designing innovative and holistic community-based business models for mica pickers in coherence and adherence with the policy," n.d. (after 2020)

[82] In the model described by Better World Foundation, workers can also receive their wages directly from the cooperative, which seems to suggest some of these transactions are in cash. (see Better World Foundation report "Designing innovative and holistic community based business models for mica pickers in coherence and adherence with the policy," n.d. (after 2020), page 9).

[83] Centre for Responsible Business, "Road-Map for Sustainable and Inclusive Mica Industry in Jharkhand: Balancing Interest of the State, Business and People," 2018. https://c4rb.org/insights/report/MICA-Roadmap.pdf

The below table explains the values inputted into the default configuration of the model for scenario 3.

The numbers: Scenario 3
Pickers income/Mica price: pickers are paid a living income by the cooperative – see scenario 2 for how this is calculated, and scenario 1 for general-order questions about the cost of holding a picking license for *dhibra*. In Scenario 3, however, we assume that mica pickers are better organised and that more concerted efforts are made to train them and to monitor workplace standards. As a result, the cost of PPE is transferred to the cooperative, and it increases to approximately 6 Rs/kg. Mica factory workers: factory workers are paid a living wage – see scenario 2 for how this is calculated. Costs to cooperative: in this scenario, we introduce for the first time a cooperative, which takes the place of the dealer, and therefore have to account for its costs. They include the costs of: o Hiring a cooperative coordinator (skilled labour, estimated 1 person per cooperative) o Hiring part-time local liaisons in each of the 10-15 villages that are members of the cooperative o Building and maintenance of a storage facility for mica at the VCC and potentially also in villages o Hiring mica sorters: 15 for every cooperative's VCC o Annual training on workplace safety standards, purchasing Personal Protective Equipment, and financing inspections/monitoring o Purchasing, refuelling, and staffing several vehicles to transport mica from picking site to village and from village to the VCC o The mica picking lease/permit Costs to JSMDC: in this scenario, we introduce for the first time the JSMDC, which takes the place of the aggregator, and therefore have to account for its costs o JSMDC pays for transport of mica from VCCs to DCCs o JSMDC also finances the initial costs for putting in place the administrative system of the cooperative, including ▪ individual mica picker registration cards ▪ an accounting system to keep track of how much each mica picker is owed ▪ a traceability system including GPS tracking of trucks o JSMDC also pays for all the costs related to holding the auction of mica bought from the cooperatives o JSMDC must employ people with skills similar to those of people working for aggregators, namely mica sorters, at the District-level Collection Centre

Taxes: There is an effective tax of 5% levied by the JSDMC off the auction price (of which just under half is given back to the cooperatives for a mica picker welfare fund). Bidders would also pay General Sales Tax and the 3 Rs/kg Transit tax.[84]

3.4.3. Impact

The structure of Scenario 3 is different in terms of stakeholders and internal organization, and its downstream impact is slightly more significant than that of Scenario 2. For instance, in terms of prices the impact on mica going into primary processing mica stands at 0.83 USD/kg, versus 0.70 USD/kg in Scenario 2. High-quality powder and flakes then sell for around 1.25 to 1.60 USD/kg, as against around 0.55 USD/kg in the status quo. Going into pigments, mica ground by pigments manufacturers increases in price; this increases pigments price by 0.43 to 0.78 USD/kg. The price of intermediate products such as OEM grade paint, vehicle droning insulation, mica board (multilayer laminate), and EV batteries also increases mildly.

In terms of finished products, strictly speaking in absolute terms the most impacted product is once again electric cars (5.17 USD price increase per car); however, in relative terms (price increase divided by price) all increases are less than 1% of the finished price and most are less than 0.1%. For this reason, the costs-margins-taxes diagram for finished products is almost identical in the status quo and in Scenario 3, as can be seen in Figure 34 below – taking the example of anti-corrosion paint. The relative value contribution of the upstream part of the chain, other than final manufacturing and retail, is negligible.

[84] It is unclear whether bidders must pay any additional tax. According to the report on the cooperatives scenario, bidders should purchase a minimum of 1 metric ton and pay "Royalty, Transit tax @ Rs.3000 per ton" along with "any other taxes." Better World Foundation, "Designing innovative and holistic community-based business models for mica pickers in coherence and adherence with the policy," n.d. (after 2020)

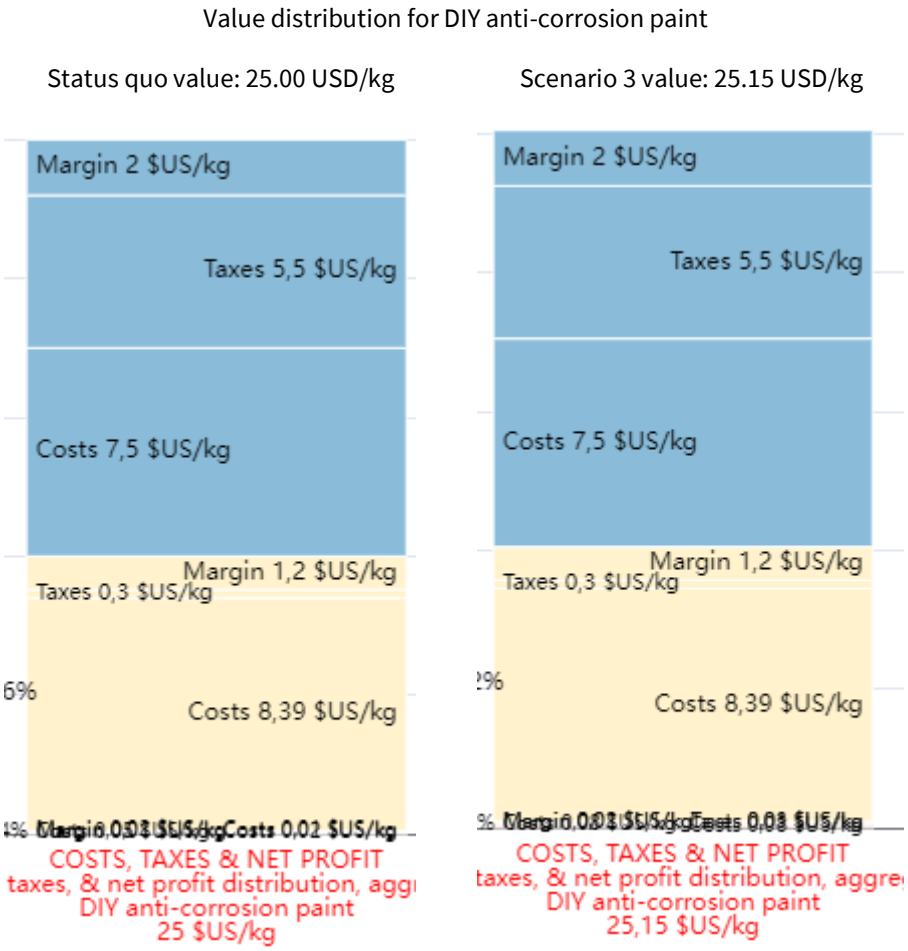


Figure 34. Value distribution for DIY anti-corrosion paint – status quo vs. Scenario 3. Source: BASIC, 2022

Only when semi-finished products are examined does the value distribution change appear more clearly. This can be seen, for instance, in the case of low grade silverwhite pigments. Although the cost of secondary processing does not change, the part of the value captured by mica pickers and factory workers, in red an orange, is much greater in the Scenario 3 diagram than the status quo – see Figure 35 below.

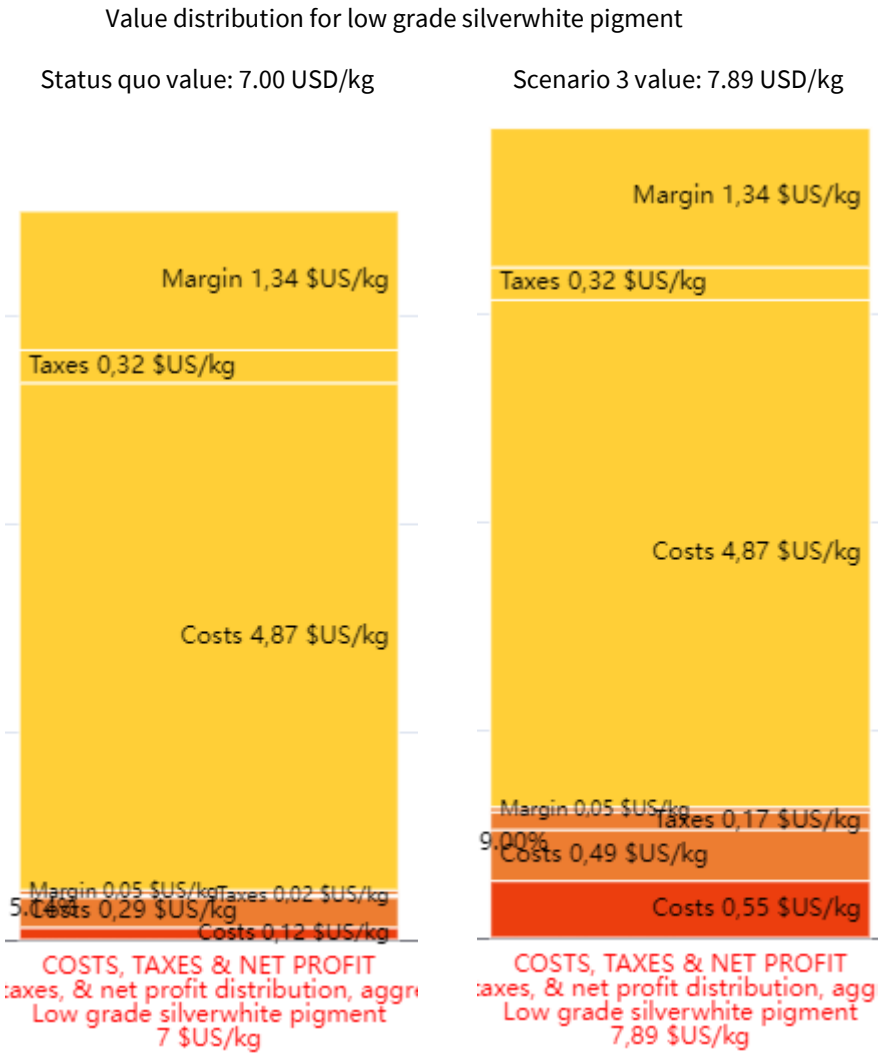


Figure 35. Value distribution for low grade silverwhite pigment – status quo vs. Scenario 3. Source: BASIC, 2022

3.5. Impacts on price, per product

The table below details the change in price for individual finished products in the status quo and under each of the three scenarios.

Finished product	Paints and coatings price (per KG)			Cosmetics price (per KG)			Vehicles price (per vehicle)	
	DIY anti-corrosion paint	DIY architectural paint (interior/ exterior)	OEM refinish paint	Nail enamel	Eyeshadow	Lipstick	Thermal car	Electric car
Status quo price	$ 25.00	$ 18.50	$ 105.00	$ 840.00	$ 1,750.50	$ 3,750.00	$ 28,128.45	$ 36,750.00
Scenario 1 price	$ 25.05	$ 18.52	$ 105.01	$ 840.00	$ 1,750.66	$ 3,750.03	$ 28,128.51	$ 36,752.21
Scenario 2 price	$ 25.10	$ 18.53	$ 105.01	$ 840.01	$ 1,750.83	$ 3,750.05	$ 28,128.58	$ 36,754.42
Scenario 3 price	$ 25.12	$ 18.54	$ 105.01	$ 840.01	$ 1,750.88	$ 3,750.06	$ 28,128.60	$ 36,755.17

Table 2. Price of finished goods studied in the survey, status quo and all three scenarios: legalisation, living income, and cooperatives.

Of the three cosmetics products, only one – lipstick –could be modelled as a finished product because it is the only one with a virtually identical, standard weight per item (3.5 grams). Eyeshadow and nail enamel are too variable in terms of packaging size (1 colour, 4 colour, 12 colour palette for eyeshadow; 5 mL, 10 mL, 15 mL for nail polish…); they are therefore only reported in KG above. If we apply a 3.5 grams per lipstick, the finished product price is as below. Note that this is just an indicative figure: the packaging (tube) is not taken into account.

Finished product	Lipstick price (per lipstick)	
Status quo price	$ 13.1250	*NOTE: The reference price per lipstick utilised was the average of Sephora-brand lipsticks, at 12.5 euros. We chose this figure because it is the least expensive and thus represents the "worst-case" scenario in terms of the impact of an increase in the price of mica. The median price for lipstick, when 30 brands were considered, was 30.89 USD.*
Scenario 1 price	$ 13.1251	
Scenario 2 price	$ 13.1252	
Scenario 3 price	$ 13.1252	

Table 3. Estimated price per lipstick in the status quo and all three scenarios, using 3.5g as the estimated weight per lipstick.

4. Conclusion

This study has examined the value chain for Indian mica, from the mine down to final consumer goods for three key sectors: paints and coatings, cosmetics, and automobiles (excluding electronics). As an output of the study, the mica value chain was modelled dynamically, in an online tool[85] that makes it possible to see both the current state of the value chain and what the chain would look like if mica pickers and factory workers were to be paid a minimum wage-level income or a living income.

The online platform traces value addition along every step of the chain. Starting from the mine, it identified five relevant outputs of primary mica processing at the export stage; around twenty intermediate products in the middle of the chain; and eight finished products at the retail stage. Each item in the model was assigned a price value, based on extensive interviews and bibliographical research. Where taxes and net profit margin were known, they were included in the costs/value-add in-between individual items. Given the focus on distribution of value in the upstream, Indian part of the chain, an effort was also made to obtain the detailed cost breakdown for the different Indian actors – dealers, aggregators, processors, and exporters, as well as cooperatives and the JSMDC in scenario 3.

Three scenarios were explored as variations from the current state of the value chain: (1) Legalisation, (2) Living income, and (3) Cooperatives. In the first scenario, the JSMDC organises auctions for dumps of *dhibra*; processors bid on these dumps and acquire a permit, and they employ mica pickers and workers at minimum wage – around 330 Rs/day, or 8,690 Rs/month. In scenario 2, the configuration is the same, but mica pickers and factory workers are paid a living income – 15,000 Rs/month for rural mica pickers, and 17,000 Rs/month for urban aggregators and factory workers. Scenario 3 departs more markedly from the status quo. It posits the existence of large mica picker cooperatives (500 members) who hold the mica mining permit and sell their mica to the JSMDC, which then puts it up for auction. In Scenario 3 as well, everyone earns a living income, including JSMDC employees.

Exploring the minimum income and living income scenarios in the value chain model makes it clear that in the current state, the greatest value-add is in the middle and end of the chain, after primary processing. The semi-finished mica products coming out of primary processing cost less than 1 USD/kg in the current state, but the products derived from them range from around 3 USD/kg for mica paper and board to 90 USD/kg for cosmetic-grade multilayer pigments. Further down the chain, value continues to accrue: the price per kg of OEM paints, for instance, is estimated as reaching 350 USD/kg. Retail also adds considerable value, such that finished cosmetics cost approximately between 900 and 4,000 USD per kg.

The consequence of this large value-add down the chain is that when prices are modelled to reflect a minimum wage equivalent or a living income for mica pickers and workers long with supply chain formalization under cooperatives, the impact on the price of intermediate products and finished retail products is negligible. In absolute terms, the extra cost at the retail stage is ordinarily less than

[85] http://micavaluechain.lebasic.com/

0.30 USD/kg,[86] or less than 0.1% of the per-kg price in most cases. This suggests that with a concerted, coordinated effort from actors down the chain, it should be possible to legalise and formalise the sector as well as pay a living income to mica pickers and workers with a minimal impact on both costs and net profit margins.

Legalising mica picking, whether through auctions to the highest bidder or through the creation of cooperatives selling straight to the JSMDC, also offers the potential for new revenue streams for the State. Goods and Services Tax is already in place for much of the chain but could hypothetically be better enforced in a legalisation scenario. In all prospective scenarios, the government earns money through the payment of mica picking licenses. In a cooperatives-with-auction scenario, the government may also choose to levy a tax on the auction price of mica. With more operators leaving the realm of illegality, it may be possible to tax corporate profits. A transit tax and royalty have also been mentioned as possibilities. Taking all of these taxes into account, in a situation where mica pickers organise into cooperatives and the JSMDC purchases and then auctions this mica at a living-income equivalent, total proceeds to the State from taxes on the scrap mica sector are estimated at 1,105,076,068.66 INR per annum, i.e., approximately 13.350 million USD.

Although ending child labour in the mica value chain is a complex problem, providing a living income for mica pickers and factory workers is a first and necessary condition for achieving this goal. The scenarios explored in this study are improvements on the current situation because they ameliorate incomes and working conditions for mica pickers and factory workers. The model that is a companion to this report suggests that if they are accompanied with sufficient political will, these scenarios could see the light of day, endowing the mica value chain with the sustainability and respect for human rights that its stakeholders wish to attain.

[86] Except for electric vehicles: in absolute terms, as detailed above, the price of electric vehicles can increase up to nearly 4.50 USD extra per vehicle (Scenario 2: Living Income). This is the highest absolute value increase of any finished product. However, in relative terms, and just like the other finished products, the increase is infinitesimal next to the price of the product itself (set at 35,000 € for one electric vehicle).

Bibliography – General

This is the general bibliography for the report. The subset of the bibliography used to review profit margins for different industries is given in a separate bibliography.

Adhikari, A., and V. Chhotray, "The Political Construction of Extractive Regimes in Two Newly Created Indian States: A Comparative Analysis of Jharkhand and Chhattisgarh," Development and Change 51, no. 3 (2020): 843–73. https://doi.org/10.1111/dech.12583.

Al-Jazeera, "Behind the Glitter: Mica and Child Mining in India | 101 East," 2020, https://www.youtube.com/watch?v=YxW4bJ9xYyE.

Bengtsen, Peter, and Annie Kelly, "Vauxhall and BMW among Car Firms Linked to Child Labour over Glittery Mica Paint," The Guardian, July 28, 2016, sec. Global development. https://www.theguardian.com/global-development/2016/jul/28/vauxhall-bmw-car-firms-linked-child-labour-mica

Bengtsen, Peter, and Laura Paddison, "Beauty Companies and the Struggle to Source Child Labour-Free Mica," The Guardian, July 28, 2016, sec. Guardian Sustainable Business. https://www.theguardian.com/sustainable-business/2016/jul/28/cosmetics-companies-mica-child-labour-beauty-industry-india-

Better World Foundation, "Designing innovative and holistic community-based business models for mica pickers in coherence and adherence with the policy," n.d. (after 2020)

Bliss, Susan, "Child Labour in India's Mica Mines: The Global Beauty Industry," Geography Bulletin Vol 49, No 3, 2017

British Geological Survey, "World Mineral Production 2016-2020," 2022, https://www2.bgs.ac.uk/mineralsuk/statistics/worldStatistics.html

Center For Responsible Business (CRB), "Road-map for sustainable and inclusive Mica industry in Jharkhand: Balancing interest of the State, business and people," September 2018, https://c4rb.org/insights/report/MICA-Roadmap.pdf

Chattopadhyay, Molly, "Sub-Contracting System and Women Workers: A Study of Mica-Manufacturing Industry of Jharkhand," Sociological Bulletin 56, no, 2 (May 2007): 33–51, https://doi.org/10.1177/0038022920070206

Child In Need Institute, "Child Labour in Mica Mines of Koderma & Giridih District of Jharkhand," 2018, http://www.cini-india.org/wp-content/uploads/2018/01/Jharkhand-Report.pdf

Continental Trade, "Paints," n.d., https://www.continentaltrade.com.pl/paints-612

Cosmetics Technology, “Top ten cosmetics companies in the world,” 26 February 2021, https://www.cosmetics-technology.com/features/top-ten-cosmetics-companies-in-the-world/

F&I Tools, “Worldwide Car Sales by Manufacturer,” 2022, https://www.factorywarrantylist.com/car-sales-by-manufacturer.html

Fortune Business Insights, “Paints and Coatings Market Size, Share & COVID-19 Impact Analysis,” April 2022, https://www.fortunebusinessinsights.com/industry-reports/paints-and-coatings-market-101947

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

France TV, « Les Enfants Des Mines de Mica, » 2016. https://www.youtube.com/watch?v=CrJtXTaOe6A.

Hi Rise Mica Company. “Home Page: Hi Rise Mica Company.” Accessed October 26, 2022. https://hirise.tradeindia.com/.

Hodal, Kate, “Children as Young as Five Make up Most of Madagascar’s Mica Mining Workforce,” The Guardian, 2019, sec. Global development. http://www.theguardian.com/global-development/2019/nov/21/children-as-young-as-five-make-up-most-of-madagascars-mica-mining-workforce

Imerys, “Mica,” 2022. https://www.imerys.com/fr/mineraux/mica

Indian Bureau of Mines, “Minerals Yearbook 2020 59th ed.: Minor Minerals, 30.16: Mica,” July 2021

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

Investopedia. “Free on Board (FOB) Explained: Who’s Liable for What in Shipping?,” September 14, 2022. https://www.investopedia.com/terms/f/fob.asp.

ITV News, “India’s Shameful Child Labour Mining for Beauty Industry Sparkle,” 2017. https://www.youtube.com/watch?v=PxjZXdwscpA.

JSMDC. “Mineral Reserves & Production,” 1995. https://www.jsmdc.in/web/MineralReservesProduction.php.

Kogel, Jessica, “Industrial minerals & rocks: commodities, markets, and uses, 7th ed.,” Littleton, Colorado: Society for Mining, Metallurgy, and Exploration (U.S.), 2006

Kumar, Sanjay, “Problems and Prospects of Mineral Industry in India: A Study of Mica Industry,” New Delhi: Mittal Publications, 1993

Lebsack, Lexy, "The Makeup Industry's Darkest Secret Is Hiding In Your Makeup Bag," 2019. https://www.refinery29.com/en-us/2019/05/229746/mica-in-makeup-mining-child-labor-india-controversy

MICAMAFCO, "Fabricated Mica," 2011. http://www.micaworld.in/fabricatedmica.html

MICAMAFCO, "Micanite," 2011, http://www.micaworld.in/micanite.html

Münstermann, Marius, and Christian Werner, "The Mica Children: Fighting for Survival in India's Deadly Mines," Der Spiegel, June 22, 2017, sec. International. https://www.spiegel.de/international/tomorrow/a-1152334.html

O'Driscoll, Dylan. "Overview of Child Labour in the Artisanal and Small-Scale Mining Sector in Asia and Africa." Helpdesk Report, October 4, 2017

Paints & Coatings Magazine, "2022 Global Top 10: Top Paint and Coatings Companies," 14 July 2022, https://www.pcimag.com/articles/110327-2022-global-top-10-top-paint-and-coatings-companies

Responsible Mica Initiative, FairWage Network, Sentio Advisory Initiative, "Report on wages, working and living conditions of Mica workers in India," February 2022

Responsible Mica Initiative and FTI consulting, "Jharkhand Sustainable Mica Policy Framework and Vision," July 2020, https://responsible-mica-initiative.com/wp-content/uploads/2020/07/Jharkhand-Sustainable-Mica-Policy-Framework-and-Vision-July-15-2020-FINAL.pdf

PriceWaterhouseCoopers PWC. "India - Corporate - Taxes on Corporate Income," May 24, 2022. https://taxsummaries.pwc.com/india/corporate/taxes-on-corporate-income.

RT France, « Mica: La Face Cachée de La Beauté, » 2018. https://www.youtube.com/watch?v=QnzhCknbK50.

Simpliance, "Latest Minimum Wages for Shops & Establishment in Jharkhand," October 2022

Sitaram Group, "Mica Scrap," 2020. https://www.sitaramgroup.co.in/mica-flakes-powder.html.

Sitaram Group. "Processed Mica," 2020. https://www.sitaramgroup.co.in/processed-mica.html.

SOMO and Terre des Hommes, "Beauty and a Beast: Child Labour in India for Sparkling Cars and Cosmetics," 2016

SOMO and Terre des Hommes, "Child labour in Madagascar's mica sector: Impact of the mica supply chain on children's rights from the Malagasy mines to the international product line," November 2019

SOMO and Terre des Hommes, “Global mica mining and the impact on children's rights,” 2018

Tapecon, “Understanding Thermal Runaway, and solutions for designing safer batteries,” n.d., https://www.tapecon.com/blog/understanding-thermal-runaway-and-solutions-for-designing-safer-batteries

Terre des Hommes, “Behind the Glittering Facade – Exploitation of Children in Mica Mining in India,” 2022. https://www.tdh.de/fileadmin/user_upload/inhalte/04_Was_wir_tun/Themen/Kinderarbeit/Mica/2022-06_Exploitation-of-Children-in-Mica-Mining.pdf

The Print, “India’s extreme poverty down by 12.3% in last decade, says World Bank,” 18 April 2022

The Times of India, “The Lost Childhood of India’s Mica Minors,” The Times of India, April 18, 2016, https://timesofindia.indiatimes.com/india/the-lost-childhood-of-indias-mica-minors/articleshow/51871390.cms

The New Indian Express, “The Mica Ghost Mines of Jharkhand,” November 12, 2016, https://www.newindianexpress.com/thesundaystandard/2016/nov/12/the-mica-ghost-mines-of-jharkhand-1537870.html

Thompson-Reuters, “Blood Mica: Deaths of Child Workers in India’s Mica ‘ghost’ Mines Covered up to Keep Industry Alive,” August 2, 2016, https://www.reuters.com/article/us-india-mica-children-idUSKCN10D2NA

Thompson Reuters, “India Begins Legalising Mica Mining after Child Worker Deaths Expose,” Reuters, May 4, 2017, sec. Thomson Reuters Foundation. https://www.reuters.com/article/india-child-labour-idINKBN1802AD

Thompson-Reuters, “Where is mica found?”, undated infographic from 2016 or 2017, https://news.trust.org/application/assets/shorthand/mica/media/mica_investigation_map1-mr.jpg

TV5 Monde, « Madagascar : Calvaire Dans Les Mines de Mica, » 2020. https://www.youtube.com/watch?v=iujwHrar9Y8.

United States Geological Survey, “Minerals Yearbook 2018: Mica,” 2018, https://pubs.usgs.gov/myb/vol1/2018/myb1-2018-mica.pdf

Bibliography – Company profits

This is the subset of the bibliography used to review profit margins for different industries. The general bibliography for the report is given in the previous section.

AkzoNobel. "Annual Report 2021," 2022. https://report.akzonobel.com/2021/ar/servicepages/downloads/files/entire-akzonobel-ar21.pdf.

Avon. "Annual Report to the Securities and Exchange Commission," 2021. https://www.annualreports.com/HostedData/AnnualReports/PDF/NYSE_AVP_2020.pdf.

———. "The Beauty of Doing Good: Responsible Business Report 2020," 2020, 42.

Axalta. "Annual Shareholder Report 2020," 2021. http://s22.q4cdn.com/144987753/files/doc_financials/2020/ar/AxaltaAnnualShareholderReport2020.pdf.

BASIC Interviews with mica industry experts, spring 2022.

BASF. "Annual Report 2021," 2022. https://report.basf.com/2021/en/_assets/downloads/entire-basf-ar21.pdf.

———. "Ten-Year Financials Summary." BASF Report 2021, 2022. https://report.basf.com/2021/en/overviews/ten-year-summary.html.

Bloomberg, and Kuncai. "Fujian Kuncai Material Technology Co. Ltd. A Financial Statements - WSJ." Accessed April 20, 2022. https://www.wsj.com/market-data/quotes/CN/603826/financials.

BMW Group. "Group Report 2021," 2022. https://www.bmwgroup.com/content/dam/grpw/websites/bmwgroup_com/ir/downloads/en/2022/bericht/BMW-Group-Report-2021-en.pdf.

Chanel. "Résultats Financiers de Chanel Limited, Exercice Clos Au 21 Décembre 2020," June 15, 2021. https://services.chanel.com/media/files/Press-Release-Resultats-2020-FR-FINAL.pdf.

L'Oréal. "Annual Report 2021: The Essentials," March 2022. https://www.loreal-finance.com/system/files/2022-03/LOREAL_2021_Annual_Report_0.pdf.

Mercedes-Benz Group. "Annual Report 2021." *Annual Report*, 2022, 348.

Merck. "Annual Report 2020," 2021. https://www.merckgroup.com/investors/reports-and-financials/earnings-materials/2021-q4/en/2021-Q4-Report-EN.pdf.

Natura. "What Can We Do for the World? Annual Report 2020," 2020. https://api.mziq.com/mzfilemanager/v2/d/9e61d5ff-4641-4ec3-97a5-3595f938bb75/b1577ae3-a5a6-9ac6-74e1-c1b1dce2eaf7?origin=1.

Natura & Co. "Annual Report 2020," 2020. https://api.mziq.com/mzfilemanager/v2/d/9e61d5ff-4641-4ec3-97a5-3595f938bb75/18ac3a48-dbb8-87fc-fe4a-dc8ac9132e6a?origin=2.

———. “Annual Report 2021,” 2021. https://api.mziq.com/mzfilemanager/v2/d/67c3b7d4-64ea-4c2f-b380-6596a2ac2fbf/a68aa190-1b5d-7378-3b39-544602912bce?origin=2.

Porsche. “Annual and Sustainability Report 2021.” 2022, 2022.

PPG. “Annual Report 2021,” 2022. https://s25.q4cdn.com/953898558/files/doc_financials/2021/ar/2021-ppg-annual-report-and-10k.pdf.

Schwan Stabilo. “Press Briefing on Annual Results 2019,” 2019. https://www.schwan-stabilo.com/gfx/media/p45/_pd_pdf1423ef7de11e792c7759c00e2a395e2d7968126ab.pdf.

———. “Press Briefing on Annual Results 2020,” November 26, 2020. https://www.schwan-stabilo.com/gfx/media/p50/_pd_pdf1a912e7d0bad09be6cc7b7871b8a30cb3f0ead93d.pdf.

Sherwin Williams. “Annual Report 2021,” 2022. https://s2.q4cdn.com/918177852/files/doc_financials/2021/ar/Sherwin-Williams-2021-Annual-Report.pdf.

Shiseido. “Consolidated Settlement of Accounts for the Fiscal Year Ended December 31, 2021,” 2022. https://corp.shiseido.com/en/ir/pdf/ir20220209_858.pdf.

Sudarshan. “Annual Report 2020-2021.” *ANNUAL REPORT*, 2021, 264.

Sun Chemical. “Sustainability Report 2020,” November 2021.

The Body Shop. “Sustainability Report 2020,” May 2021. https://api.mziq.com/mzfilemanager/v2/d/67c3b7d4-64ea-4c2f-b380-6596a2ac2fbf/18bc79ff-a9c7-448d-7b59-6bada31bdabd?origin=1.

Yves Rocher. “Annexe Au Rapport de Gestion Du Conseil d’administration à l’assemblée Générale,” 2019. https://groupe-rocher.com/sites/default/files/fichier/DPEF%202019%20GROUPE%20ROCHER_0.pdf.

Annex 1: Modelling methodology

The purpose of this section is to lay out the main methodology utilised to build the mica value chain model. The overview section explains the difference between the mica value chain structure on the one hand, and prices and costs on the other. Then, more detailed information is provided on the sources of information that were used to determine the value chain structure as well as price/cost information, as well as how data points from these sources were amalgamated to arrive at a single average value for the purpose of modelling.

It is relevant here to underline that making choices for a model is difficult business, as it entails a making a drastic simplification of reality. Individual data points collected in interviews were sometimes incomplete; often, they were not as systematic or exhaustive as one might have liked, or the data points were difficult to "plug in" to the model. In these cases, an educated guess was made to exploit the data in a manner most fitting with the exigencies of the model. Likewise, a concerted effort was made to triangulate data from multiple data sources. In the model, all but a few values for product prices are based on at least 2 independent sources. This is discussed in greater detail below.

Overview

The mica value chain model is articulated around a succession of prices and costs, beginning with the upmost section of the value chain (mica picking) and going all the way to retailed finished product (finished product for the consumer, such as car, lipstick, nail enamel, DIY paint, etc.). There are two fundamental inputs that structure the model and enable it to work. These are:

1. The mica value chain structure, i.e. the architecture of the value chain. Figure 36 below illustrates this value chain structure, which is like a complex flowchart. The value chain structure retraces each individual step in the value chain from upstream to downstream, including convergences (several products used to produce the next one) and divergences (one product used to produce several different products), and providing a picture of mica's different transformations and uses. In the model, the value chain structure is visible and embodied in the model's flowchart-like structure, and in how different elements relate to one another. In the diagram below (Figure 36) as well as the one farther down (Figure 37), objects with prices are represented as rectangles along with their price, while operations (i.e. value-adding transformations) are represented as ellipses, along with their value added. An example of a decision concerning the mica value chain structure is the decision to retain 5 semi-finished mica products as an output of primary processing. This decision is independent of information about prices.

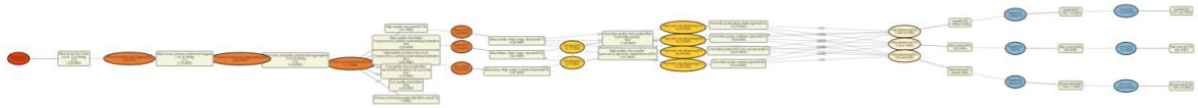


Figure 36. Simplified value chain structure for mica, from mining in India to cosmetic retail in Europe, i.e. the 'skeleton' of the value chain. Source: BASIC

2. Prices and added value for mica-based products, from mine-gate to processors and exporters all the way down to retailed finished products. The model distinguishes between *prices*, which represent the price at which an item is sold, from *added value*, which represent the value added by an operation between two products in the chain. For instance, the price of "Mica scrap, primary sorted and bagged" (mica collected by dealers) is around 13 Rs/kg, and the cost of the next operation applied to this mica is "Secondary sorting and bagging," an operation conducted by aggregators, which costs 7.72 Rs/kg. For the Indian part of the value chain, it was possible to arrive at a detailed cost breakdown for dealers, aggregators, primary processors, and exporters.

Figure 37. Example of a series of prices and costs in the value chain model. Source: BASIC

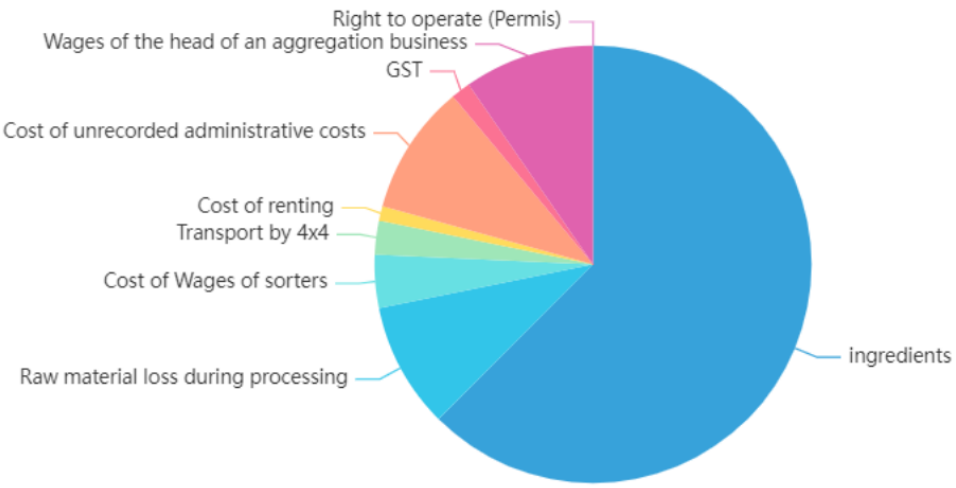


Figure 38. Example of a cost structure breakdown: Secondary processing value-add diagram

Mica value chain structure

The mica chain value structure was initially developed based on a bibliographical review encompassing how mica is mined, how it is collected and transformed, in what semi-finished and finished products it ends up, and (when this information was available) where in the world each of the links in the chain takes place. This led to an initial flowchart illustrating the scrap mica value chain from mine to finished product (see below Figure 39). Being a draft document from early in the study, there are some inaccuracies in this diagram: for instance, the role of calcined mica was unclear as of May 2022. Interviews subsequently helped to clarify what calcined mica is, and why and for what it is

used. The updated and corrected scrap mica transformation flowchart is given in

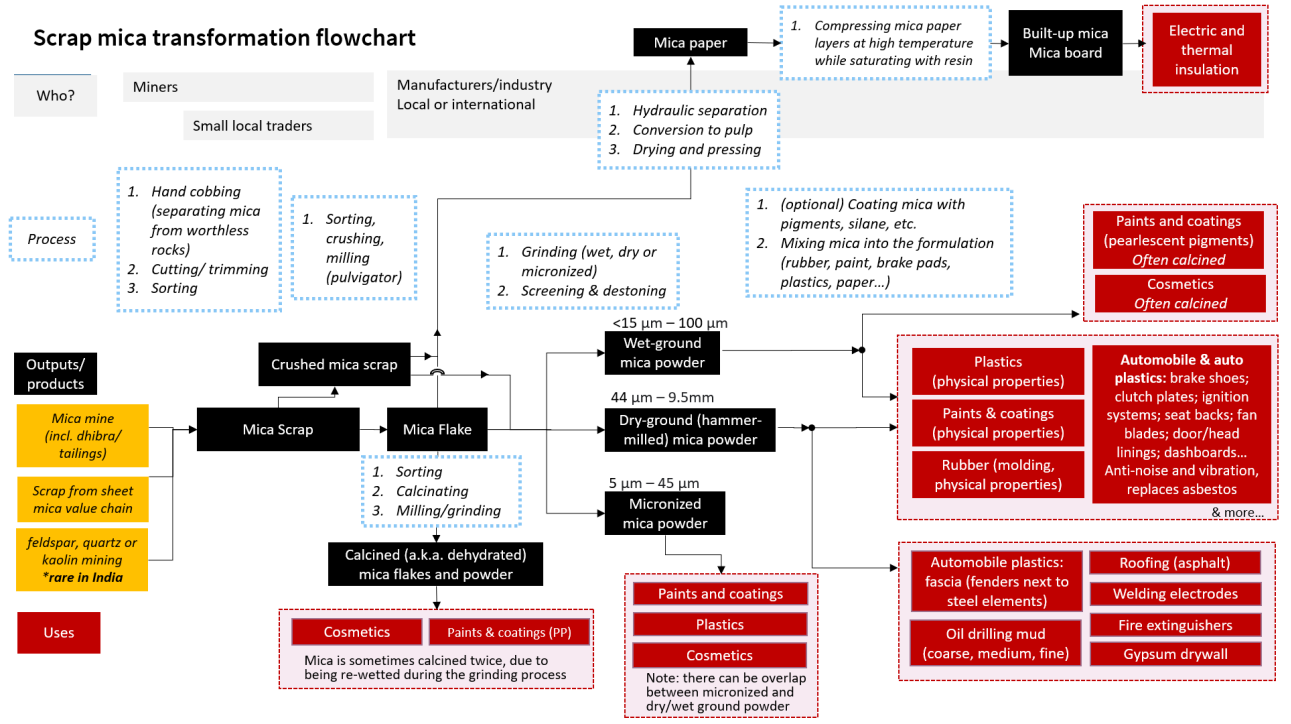


Figure 40 and in the main text of the report (Error! Reference source not found.).

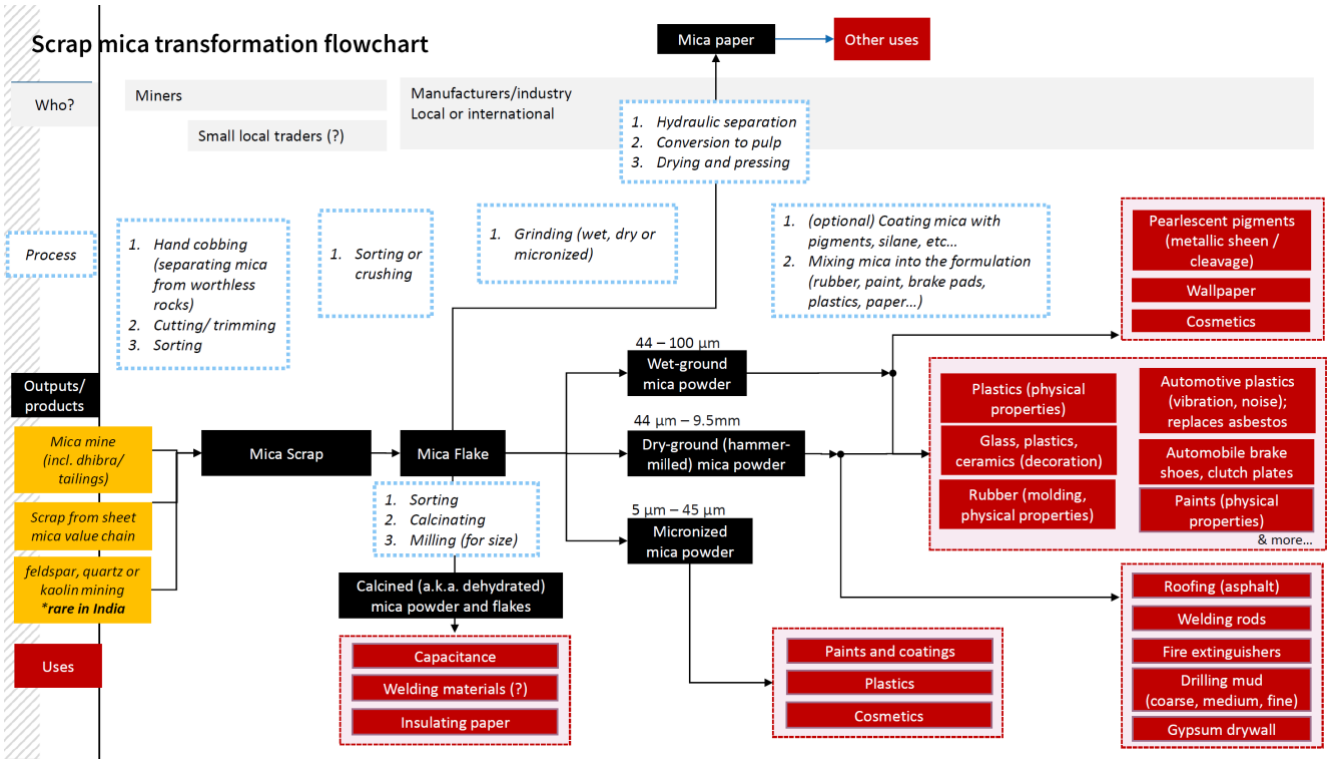


Figure 39. Simplified scrap mica value chart from the initial bibliographical review. Source: BASIC, May 2022

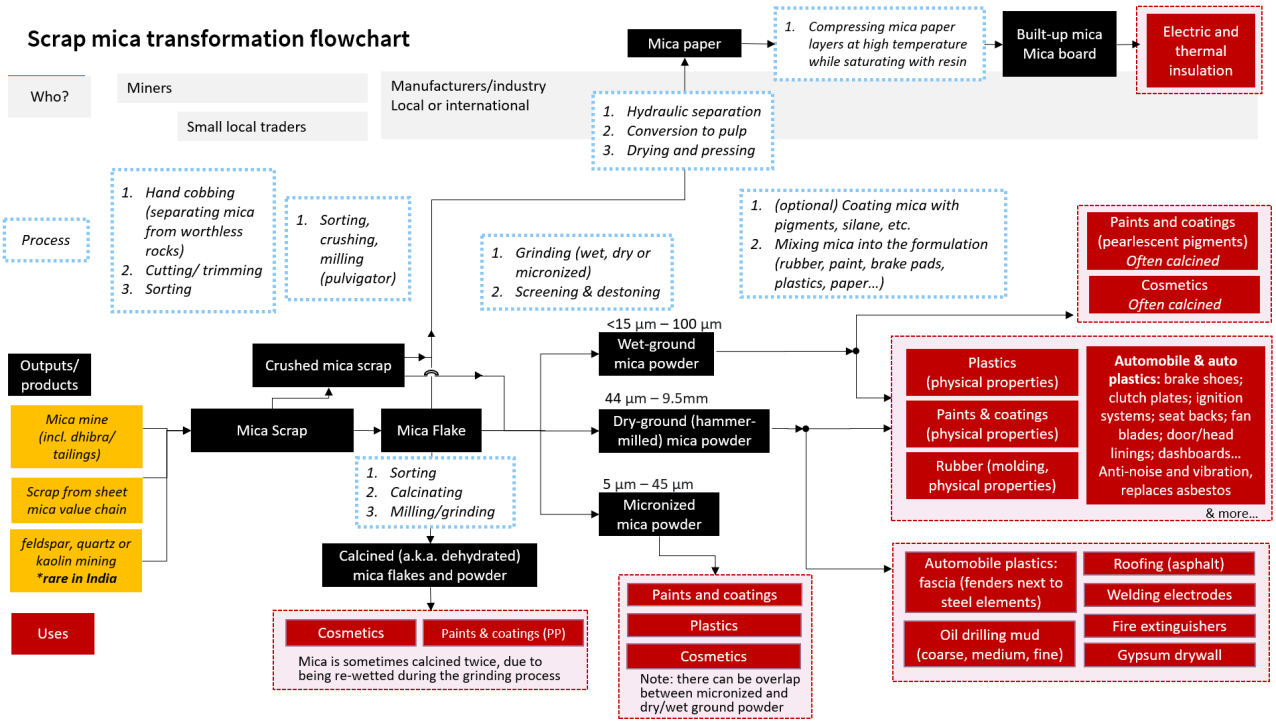


Figure 40. Simplified scrap mica value chart corrected at end of survey. Source: BASIC, November 2022

Subsequently, our interviews with RMI members and other stakeholders as well as more research made it possible to settle on a more detailed and more accurate vision of the value chain. Among the improvements were:

(1) breaking down the India value chain into picker → dealer → aggregator → processor → exporter
(2) designating key products that summarise the complexity of the products on offer, such as the choice of 5 outputs from primary processing
(3) refining our understanding of the pigments business as a 3x4 matrix of three grades of quality and four types of pigments (see next section for more detail)
(4) settling on a five-part breakdown of the value chain, from mica pickers all the way down to final consumer, as indicated in Figure 41 below:

1. Mica picking
2. Sorting, Primary processing, and Export
3. Grinding, Pressing, and Pigment manufacturing
4. Finished product manufacturing
5. Retail

Figure 41. Five-part scrap mica value chain, from mine to final consumer. Source: BASIC, November 2022

Altogether, this phase of the research made it possible to build the "skeleton" of the model – the first dimension of the model, i.e. the value chain structure. Simultaneously, interviews at this time were also indispensable to obtaining information on the second dimension of the model, i.e. prices and value added, as explained in the following section.

Value chain prices and costs

This section describes how prices and costs were attained for input into the value chain model. The model was inspired by the work that led to Figure 39, and it broadly reflected its structure. However, a key difference is that the model was to contain information on prices and costs, margins, and taxes. Further, the downstream – and to a lesser extent, the upstream – sections of the value chain were entirely revamped to account for the physical flow and transformation of matter as described by our interviewees. This section on values and costs is organised into five sub-sections – one for each of the five subparts of the value chain (see Figure 41 above).

In terms of sources, there were three main sources of information for obtaining data on prices and value added. They are:

1) General bibliographical research, on mining and mica picking in India and on the price of semi-finished and finished products derived from mica
2) Interviews conducted with BASIC, mostly with RMI members
3) Fieldwork conducted by RMI members in India

We also counter-verified our figures against the Descartes Datamynes database, which contains detailed customs data on every shipment of mica (HS code 2525) and worked mica (HS code 6814) out of India from the mid-2010s to today.

Value chain prices and costs: Mica picking

The mica picking stage of the value chain refers to the stage where dealers purchase raw material mica from mica pickers. It is possibly the single most important stage in the value chain, as this first price represents the income that mica pickers receive for their work. It is also the basis upon which

all subsequent actors build their prices, and it is the value that would move in the event that any of the scenarios described in the study were to occur. To obtain this figure, we used especially all of our information sources: bibliography, interviews, and RMI fieldwork.

In the real world and at present, the actual value of this parameter varies greatly, from place to place, and most importantly based on the quality of the product. For scrap mica, estimates range from a low of as little as 5.5 Rs/kg to a high of as much as 45 Rs/kg. Several interviewees used 10 Rs/kg as a simplified reference value. One important source for information on this data point was the work conducted by RMI's field workers, who were able to conduct multiple interviews with dealers to ascertain the price of mica but also their cost structure and how it is passed on downstream to aggregators. Taking all this information into account, we set the reference value of scrap mica at 8 Rs/kg.

Value chain prices and costs: Mica sorting, processing, and export

The next section of the value chain encompasses everything that takes place in the field, from the initial purchase of mica from the mica picker by dealers, through to secondary sorting by aggregators, though to primary processing into 5 major semi-finished products (plus one waste product with value of zero), through to export of these products to stakeholders downstream. To obtain the values in this section, we relied equally on all three main sources of information: bibliography, interviews, and RMI fieldwork, plus counter-verification with customs data.

Both price and costs data for this section of the chain was heavily supported by interviews and fieldwork by RMI staff, who conducted structured interviews with dealers, processors and aggregators. For prices (rectangles in the model), raw data was often in the form of price brackets reflecting lowest to highest quality mica. We chose intermediate values within those brackets – starting with a simple average, and then adjusting based on the costs of the step preceding the rectangle if need be. Prices and costs were counter-checked with existing bibliographical information, other interviews conducted by BASIC, and customs data to make sure the figures made sense.[87]

At these stages, there begin to be losses along the chain. For instance, as mica is progressively cleaned and sorted by dealers and aggregators, there is a loss in the volume of mica on the order of 5 to 10% at each step.

Some additional assumptions at these stages:

1) We consider primary processing to be a single operation of transformation, which produces five semi-finished products and a sixth item – waste by-product not suitable for sale. The reason there is waste is that while virtually all powdered mica by-products can be sold (in particular to the petroleum industry as an add-on to the slurry used in drilling), not all mica processing factories go to the trouble of selling their leftover powder on this market.

[87] The counter-verification against customs data did not uncover significant differences with the values of the 5 semi-finished mica products, with the exception of high-quality mica powder, which priced at about 50% higher than our value from interviews and RMI fieldwork. This discrepancy is likely because our interviewees in India had lower standards for "high quality powder" than the standards we used to filter the customs data. As is often the case with mica, quality has a high impact on price.

2) Further, in our model we took care to take into account that the outputs of any added-value calculation be coherent with the data, according to the following formula SUM(Quantity or ratio x Price of each output) = Scrap mica content + Costs + Margins.

Value chain prices and costs: Secondary processing

The secondary processing section of the value chain covers the activities of pigments manufacturers, mica board manufacturers, and manufacturers of bituminous sheets for vehicle droning insulation. For secondary processed mica, we based our prices on extensive interviews with RMI members on their production costs and sales prices for various products, complemented with bibliographical research.

In the case of pigments, our research quickly identified that pigments were both of four different types (i.e., chemical composition and industrial process) and three different grades (from lowest quality, for DIY paint to highest quality, cosmetics grade pigment, with automotive pigments somewhere in between). This meant that we needed to fill a three-by-four price matrix. This was done by cross-checking every data point given by interviewees, particularly RMI members, and assigning it and any others like it to the correct section of the matrix. The values rendered into the model were the result of averaging all the values collected in the research, with minor adjustments to give greater weight to sources that appeared more credible, precise, or otherwise well-informed.

As in the previous section, there are losses at the secondary processing stage. We estimate them to be on average around 10%, but with considerable variation from stakeholder to stakeholder.

Value chain prices and costs: Finished product manufacturing

As for secondary processing, for finished products, we based our prices on extensive interviews with RMI members on their production costs and sales prices for various products. This was complemented with bibliographical research on the same. Wherever information was available, we factored in average margins per company sector.

At this stage of the value chain, we did not give a detailed breakdown of costs for all the value-add operations. This is because collecting such information was prohibitively time-consuming, given the variety of stakeholders and the complexity and worldwide nature of such information. Only for the upper end of the chain in India were we able to obtain detailed cost breakdowns, thanks to the presence of additional manpower for research, as well as a relatively straightforward and narrow research mandate (dealers, aggregators, processors). We did, however, obtain information through interviews and bibliographical research on average margins for the largest classes of industrial/final product manufacturer in the value chain, i.e. pigments manufacturers, OEMs, cosmetics manufacturers, and paint manufacturers (for bibliographical sources see Bibliography – Company profits).

Value chain prices and costs: Retailing

Our model assumes that retailers add 100% to the value of the finished product, i.e., they sell a product for double the price at which they buy. This is based on two sources: first, an interview with an expert in the retail sector, who explained that before-tax price to consumers is typically about double the out-of-factory price. Second, this value squares with BASIC's own research into the food sector, where practices are similar: out-of-factory price doubles to make the before-tax customer price in retail. In our model, out-of-factory prices for finished products are based on this backwards calculation: from the tax-free retail price, the price is halved to obtain the out-of-factory price.

We set the VAT rate at 20% percent, taking as our basis European countries – France, Germany, and the UK with 20%, 19% and 20% respectively. For reference, in the USA the median value added tax rate (combined state and local taxes) is 6.98%.[88]

Scenario building

Prices and costs for the purpose of scenario building relied heavily on interview data collected by RMI staff in India, alongside bibliographical research both online and in reports on the mica sector (see "Bibliography – General" section). Some figures were calculated based on a combination of raw data and back-of-the-envelope estimates, such as amortisement costs for vehicles or the cost of wages for mica sorters at the secondary sorting and aggregating stage.

Scenario building entailed identifying new costs that would have to be borne by stakeholders along the chain in each of three conditions: legalisation, living income and cooperatives. For Scenarios 1 and 2, we make the strong hypothesis that dealers, and aggregators/processors are able to transmit the cost increase down the chain rather than paying it themselves. In other words, none of these upstream actors need to lower their margins. In Scenario 3, we recreated an entirely new value chain and filled in its values from scratch (new hypotheses and new stakeholders along the chain).

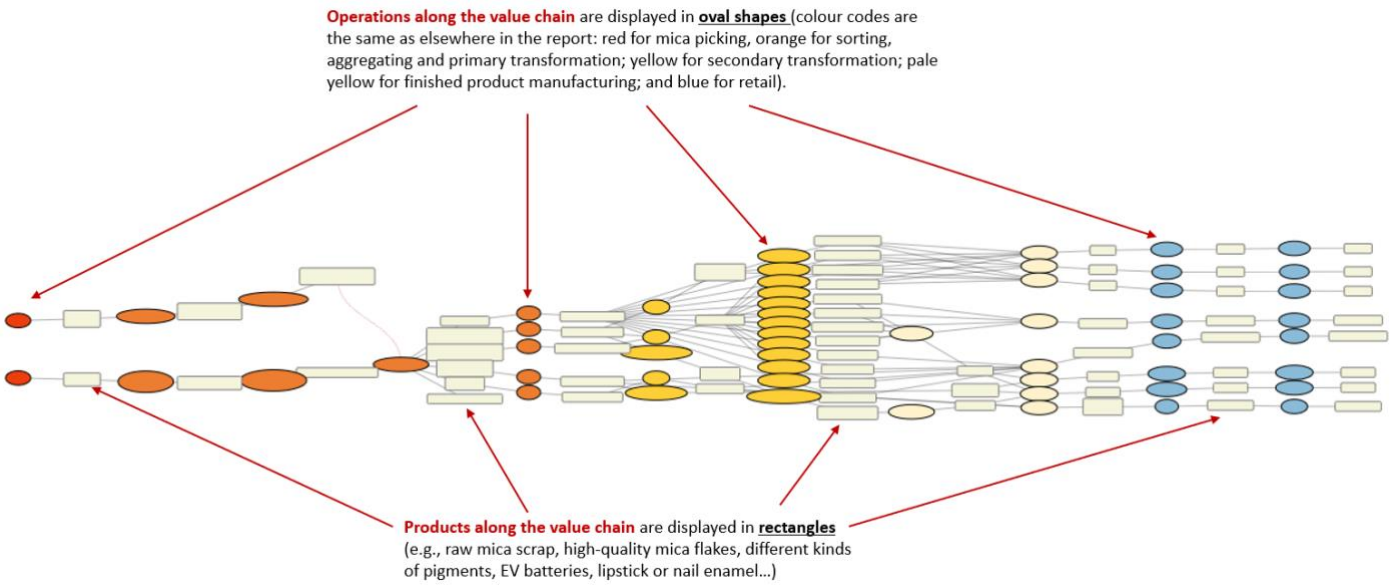
Price increases were transmitted along the chain in absolute terms, proportional to the contribution of mica to the products along the chain. In other words, once the model leaves India (after export), we hypothesise that absolute value increases are transmitted down the chain, prorated for the content of mica in any given product. This is why in some cases, the absolute increase in price for mica is lower downstream of semi-finished products (for instance, pigments), i.e. the mica price increase may be higher at the primary processing stage than it is at the pigments stage because mica content in the downstream product is less.

[88] See https://taxfoundation.org/2022-sales-taxes/ for state and local taxes.

Annex 2: Guidance document for the online tool

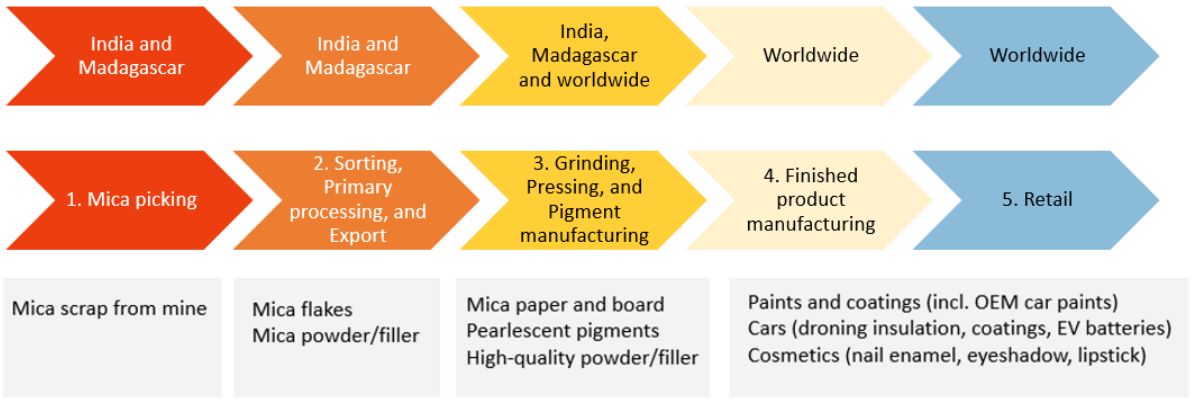
Contact for the website: theodore@lebasic.com

This website works first with a detailed diagram that shows the different modelled products and physical operations along the chain. Operations along the chain are displayed in oval shapes, while products along the value chain are displayed in rectangles:

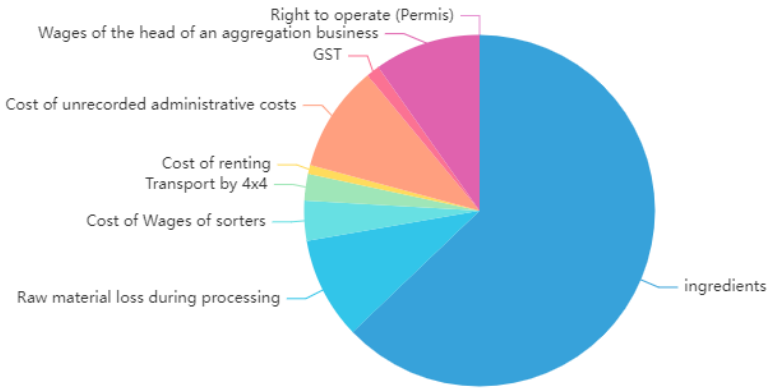


Throughout the model, colour codes correspond to the different stages in the value chain:

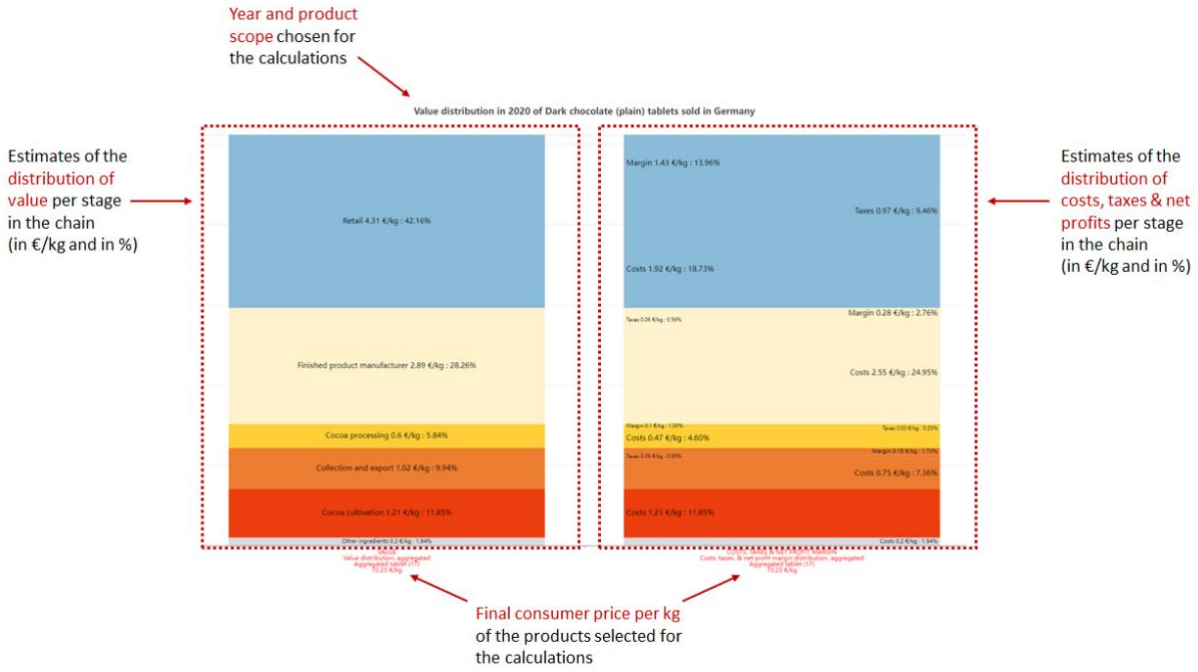
- Red: Mica picking
- Orange: Sorting, Primary processing, and Export
- Yellow: Secondary processing (Grinding, Pressing, and Pigment Manufacturing)
- Pale yellow: Final product manufacturing
- Blue: Retail



When clicking on any of the operations displayed in an oval in the Value Chain diagram, a pie chart appears below showing the breakdown of the costs, taxes and net profit margins associated with this operation. By moving the mouse pointer over this pie chart, it is possible to display the exact amount (in USD/kg) and the proportion of total costs (in %) of each slice of the chart. The below is an example obtained by clicking on "Secondary processing and aggregating" in the Current value chain tab:

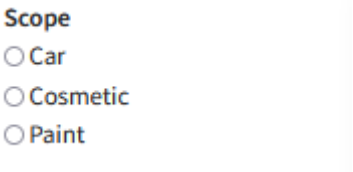


When clicking on any of the modelled products displayed in a rectangle in the Value Chain diagram, the distribution of value, cost, taxes, and net profit margin from the mining up to this specific modelled product appears.

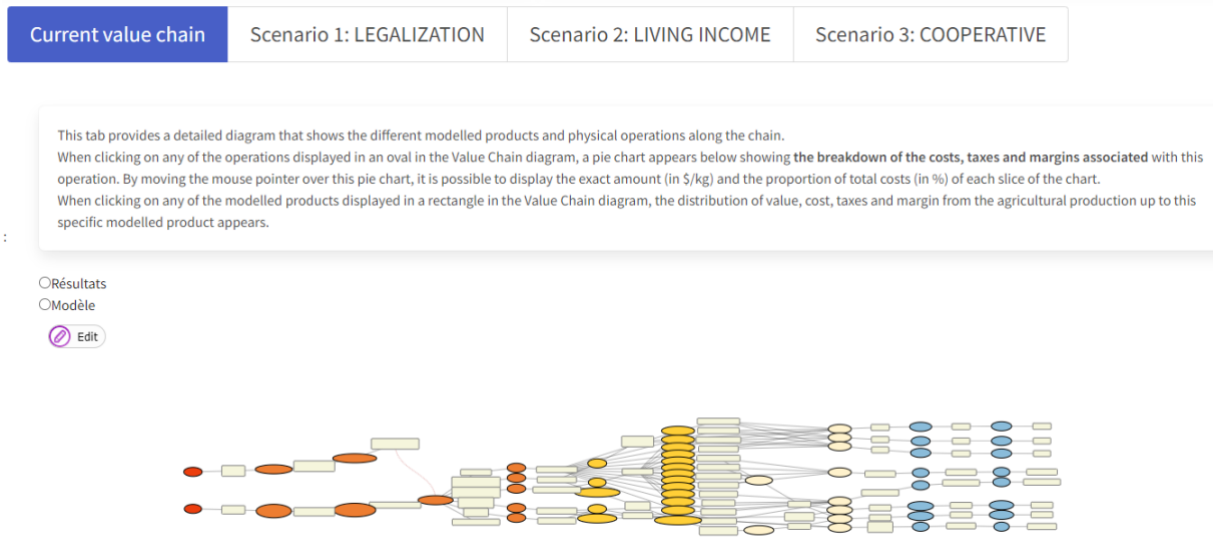


Each colour shows you the average amount of value, costs, taxes and margins modelled for the five main typical group of actors of the value chain, as detailed above.

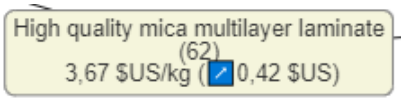
On the left of the webpage, you can select to display only one specific sector:



The model also enables you to choose to visualse the impact of each of the three scenarios, by clicking on the large buttons on top of the screen.

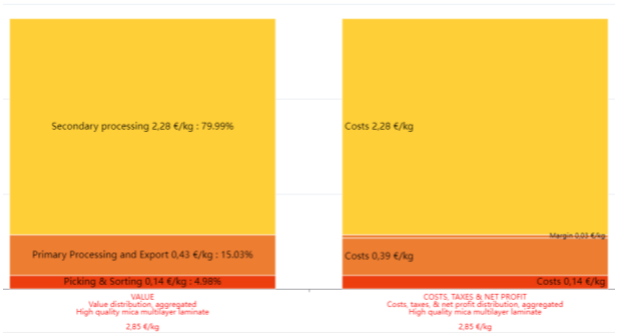


For each product (rectangle) in the value chain, the new price resulting from the scenario is given inside the rectangle, alongside the increase in price marked by parentheses and the ↗ icon. For example, in this example taken from Scenario 1, the new price of high-quality mica multilayer laminate is 3.67 USD/kg, which is 0.42 USD/kg above the price of the status quo:

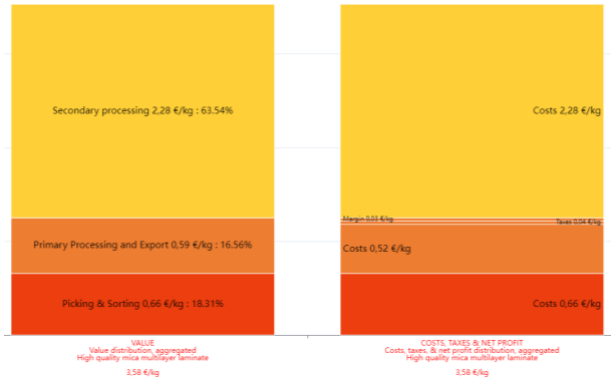


When clicking on any rectangle (product) in the model within an individual scenario, it becomes possible to see the difference between this scenario and the status quo. Specifically, upon clicking on a rectangle (product), two bar charts appear below: the first is the value distribution graph for the current scenario, and the second is the value distribution graph for the status quo.

Here is an example for high quality mica multilayer laminate in Scenario 3: at left is the status quo graph, and at right is the Scenario 3 graph. The greater share of value captured by mica pickers and factory workers, in red and orange, is clearly visible:

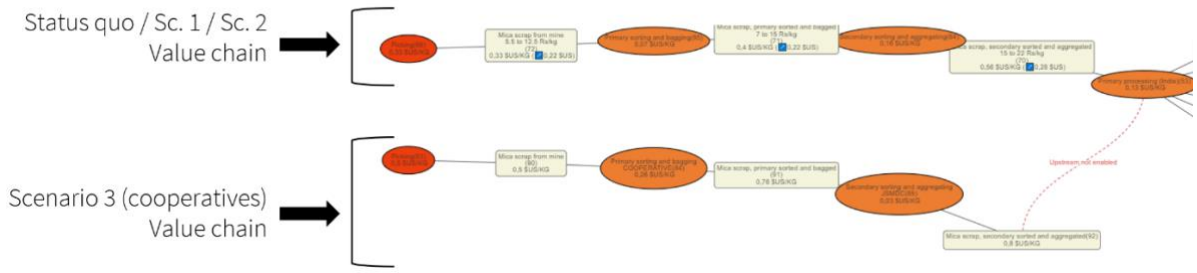


Value distribution for multilayer laminate, status quo
Price: 2.85 USD/kg



Value distribution for multilayer laminate, Scenario 3
Price: 3.58 USD/kg

With Scenario 3 being the most advanced and sought-after of all scenarios, we decided to make it easier for users to benchmark the different scenarios (status quo, 1, and 2) against that Scenario 3. Consequently, the model displays the upstream part of the Scenario 3 value chain on the side of the relevant scenario value chain. The Scenario 3 value chain can be recognsed from its counterpart by its branching off to the side as well as the presence of a dotted red line:



In Scenario 3, the additional value chain displayed is that of the status quo/current value chain.