ICICI Lombard

CORPORATE INDIA RISK INDEX

2024

Intelligence partner FROST & SULLIVAN

Navigating Risks, Powering India's Growth

SECTOR REPORT 2024

Metal & Mining

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Preface

Corporate India Risk Index is primarily an academic exercise to understand the level of risk that companies are facing and also assist in developing a successful risk aversion plan, CIRI is a first-of-its-kind risk measurement tool to gauge the level of a company's risk exposure and preparedness. This Corporate risk comprises of various aspects of the business–spanning customer, competition, regulatory environment, business operations, technology finances, environmental factors etc. The impact of unprecedented events is significantly higher now.

This Index is a comprehensive framework that draws upon global risk management best practices and comprises of 32 risk elements across 6 broad dimensions. The Risk Index is based on the principles of Lean and Six Sigma that qualify business processes by measuring effectiveness and efficiency.

ICICI Lombard's Corporate India Risk Index provides a crucial tool for assessing and addressing risks, fostering resilience and adaptability in the ever-evolving global landscape. In the current climate of increasing macroeconomic uncertainties, it is essential for corporates to prioritize robust risk management. We believe that a proactive approach to risk management not only fortifies individual businesses but also contributes significantly to India's overall economic growth and stability.

Executive Summary

In 2024, India's metals and mining sector continued to play a vital role in the nation's economic growth, supporting industries like construction, automotive, energy, and electronics. The sector benefitted from rising domestic demand for metals such as steel, aluminum, and zinc, driven by infrastructure development and industrial expansion. Government initiatives under the "Atmanirbhar Bharat" campaign promoted self-reliance, encouraging mineral exploration and private sector involvement. However, challenges like resource scarcity, regulatory complexities, and supply chain disruptions remained prominent.

Sustainability became a central focus, with companies adopting decarbonization strategies and embracing circular economy practices to reduce environmental impact. Technological advancements in automation, AI, and digital technologies enhanced operational efficiency, offering companies a competitive edge. While commodity price volatility and land acquisition issues persisted, efforts to strengthen risk management and rehabilitate mined-out areas were prioritized.

Overall, India's metals and mining sector in 2024 demonstrated resilience by balancing growth with sustainability, leveraging government support and technological innovations. Despite ongoing challenges, the sector is well-positioned to contribute to India's economic ambitions while aligning with global sustainability trends.

Introduction

ICICI Lombard Corporate India Risk Index is a one of its kind, unified, credible, standardized corporate Risk Index that spans over the country level, the industry level, and the company level. The index has a comprehensive sector coverage. Aerospace and Defence, Agriculture and Food Processing, Automotive and Ancillary, BFSI, Biotech & Life sciences, Chemicals and Petrochemicals, Education Skill Development, Energy, FMCG, Healthcare Delivery, Infra and Realty, IT/ITES, Manufacturing, Media and Gaming, Metals and Mining, New Age & Startup, Pharmaceuticals, Telecom and Communication Technology, Tourism and Hospitality, Transportation and Logistics.

The impact is identified across key business risk (internal and external) under the following 'Strategic Risk Areas', The ICICI Lombard Corporate India Risk Index Framework comprises of 32 risk elements across 6 broad dimensions.

Market and Economic Risk

Corporate Risks arising due to market and economy related factors, such as internal or external political uncertainty, global slowdown, taxation-regulatory changes etc. Market and economy related risks are also identified as 'Systematic Risks', we have further classified the risks into below mentioned categories.

- **Inflation**: Inflation is the general increase in prices within the economy. The rising prices for businesses could result in bigger production spending and a fall in profitability. The companies should be attentive, acute, and responsive to changes in inflation to efficiently manage the prices of final products.
- **Taxation**: In a large democracy like India, complexity of multiple taxes (multiple taxes like GST, custom duties, central excise duty, etc.) is a major concern. The changing legislations, increased scrutiny by tax authorities and increasing public attention are together resulting in tax risks for organizations. There is, thus an increasing urgency for firms to manage their tax affairs efficiently to minimize tax risks.

- **Regulatory Risks**: Regulatory risk is the risk of changes in regulations and laws that might affect an industry or businesses. The regulatory changes can pertain to tariffs and trade policies, business laws pertaining to employment, minimum wage laws, financial regulation, Foreign Direct Investment etc.
- **Foreign Exchange Risk**: The exchange rate plays an important role for firms who export goods and import raw materials. The fluctuations in foreign exchange will have great impacts on the prices of traded goods. For example, if the currency depreciates (devaluation), the exporting firms will benefit. However, the firms importing raw materials will face higher costs on imports. The firms need to hedge their exposure to foreign exchange risks to insulate themselves from the impact from forex changes.
- **Geo-political Tension**: Geopolitical risk means the political and economic risks that are a potential threat to the financial and operational stability of companies.
- **Competitive risk**: Competitive risk is the risk associated with the fact that there are multiple companies competing in the market, each seeking to obtain the highest position and consumer ratings, to gain maximum benefits for themselves. The companies devise different strategies to garner a higher market share and acquire customers from competitors. Any failure in managing the competitive stand could lead to losses in business, thereby making marketing and competition a major risk in market.

Technology Risk

Technology risks are also identified as information technology related risks which may arise due to failure of any installed hardware or software system, spam, viruses or any malicious attack. Also delay/over/under adoption of trending disruptive technologies can lead to technology related risks. We have classified the risks in below mentioned categories.

- **Innovation Risk / Obsolete Technology**: Innovation is the key to success in all the industries. Risk of redundancy and losing out to competition on account of poor R&D is a major concern.
- **Intellectual Property risk:** Dependence on trade secrets and unpatented proprietary know-how.
- **Disruptive Technologies:** These will fundamentally alter the financial prospects of the industry.
- **Data Compromise:** Hardware failure refers to malfunctions within the electronic circuits or electromechanical components (disks, tapes) of a computer system; Software failure refers to an operating system crash. Such failures lead to stoppage of entire computer or operating systems creating substantial losses to business.

Operational and Physical Risk

Risk of losses caused due to faulty or failed processes, systems or human resource related inefficiencies are classified as operational and physical risks. We have classified Operational & Physical risks in below mentioned categories.

- **Critical Infrastructure Failure / Machine Breakdown:** Industries with a heavy dependence on machinery consider any rise in machinery breakdowns a hindrance to their businesses operations. An untimely equipment breakdown can bring businesses to a standstill or be the root cause for fires and explosions. Mostly, human errors and deferred maintenances are the major reasons for such breakdowns. The companies should actively invest in timely maintenance of all machineries.
- **Business Continuity / Sustainability:** Non adoption of Business Continuity/ Sustainability Plans and Lack of Internal Control tools would result in: Failure of businesses, Brand Equity / Loss of reputation, Financial Loss, Business model Failure, Ineffective engagement/communication with stakeholders, Losses in productivity, Lack of opportunity monitoring.
- **Supply chain risk:** Raw Material unavailability and Heavy Dependence on Global Supply Chains / Supplier concentration risk. Unavailability of raw materials owing to disruption in the supply chain or heavy dependency on one source (company/country) which is unable to supply owing to some geo- political tensions, fires, or any other incidents. Transportation is one of the key activities for companies making it an important risk to mitigate. The loss of goods in transit and spillage is one of the major concerns as it accounts for a sizeable loss of revenue to companies.
- **Commodity Price Risk - Volatility in prices of raw materials:** The fluctuations in raw material prices creating a margin pressure / top-line pressure in the scenario of rising input costs.
- **Portfolio Risk:** Loss of key customers, Customer concentration - Key customers accounting for a larger share of revenue, Over-dependence on suppliers, Business Model Risk: Transformative changes in business model, Tail Risks: Ability to overcome or manage extreme worst-case scenarios.
- **Environmental Hazard Risk:** Any environmental hazard having the potential to affect the surrounding environment.
- **Workplace Accident:** Fire and Explosion Hazards, Containment Incidents, Workplace Injuries
- **Human Resource:** Key person risk: This risk occurs when a business or business unit becomes heavily reliant on a key individual. Talent acquisition and retention - The companies require a highly skilled labor force for R&D as well as continuous production. Accessing skilled resources and expertise on an on-going basis is one of the major challenges; moreover, retention of trained staff is imperative. Labor shortages, Union Strikes & Industrial Actions, Employee

health, safety, and security (SHE/Sustainability risk).

- **Financial Risk:** Financial Reporting Risk: Material misstatement of Financial Statements, whether due to fraud or error. Interest rates and equity prices: Interest rate risk arising out of working capital borrowings at variable rates. Equity price fluctuations affect the Company's income or the value of its holdings of financial instruments. Liquidity Risk (Credit Risk / Receivables).
- **Breaches of law (local/ international):** Voluntary/ involuntary breaches of law can lead to costly lawsuits.

Crime & Security Risk

Cybersecurity risks relate to the loss of confidentiality, integrity, or availability of information, data, or information (or control) systems and reflect the potential adverse impacts to organizational operations. These attacks can cause major financial losses, reputational harm, and a loss of client trust. Regarding cybersecurity, the BFSI industry in India has several difficulties, including difficult-to-secure legacy systems, a shortage of qualified cybersecurity personnel, and the requirement for ongoing system and network monitoring. There is a significant investment in cybersecurity tools like network monitoring, endpoint security, access control, and threat intelligence. Many organizations are also implementing cutting-edge technology like artificial intelligence and machine learning to strengthen their security posture.

We have classified Crime & Security risks in below mentioned categories.

- **Cyber Crimes:** Data Theft, Spam, scams and phishing, Hacking, Malwares and Viruses, Piracy, Fraud, Corruption, Malicious attacks
- **Counterfeiting:** Counterfeiting of goods/services leads to loss of revenues, profits and ultimately affects the brand equity
- Threat to Women Security
- **Terrorism:** Un-lawful use of violence and intimidation, especially against civilians, in the pursuit of political aims.

Natural Hazard Risk

A natural hazard is the threat of an event that will likely have a negative impact. A natural disaster is the negative impact following an actual occurrence of natural hazard if it significantly harms a community. Due to India's geographical structure, it is one of the most disaster-prone countries in the world. Natural hazards like floods, earthquakes, landslides, and cyclones are common risks faced by India. The situation has worsened due to rise in GHG emissions, loss of biodiversity, deforestation, and degradation of environment. Natural disasters hamper the day-to-day

operations of corporates, and it is important for them to understand that such risks cannot go unheeded. Over the years, Indian corporates have learnt to mitigate such risks by diversifying their supply chains, having multiple logistics partners, diversified geographical presence and multiple vendors.

- **Pandemic and other global epidemic diseases:** Risk to business owing to disruptions caused by global pandemic scale events like the COVID-19 pandemic

Strategic Risk

Strategic risk is the risk of undesirable outcomes of business decisions which may impact a company. Strategic risk is often a major factor in determining a company's worth, particularly observable if the company experiences a sharp decline in a short period of time. Several factors, such as unethical or unlawful activities, poor customer service, product recalls, data breaches, or unfavorable media coverage, can lead to strategic risk. An organization's reputation can be severely harmed by a single negative incident, such as a high- profile data breach or fraud scandal, resulting in a loss of clients, income, and market share.

- **Resource scarcity / Misutilization / Overall Utilization:** Difficulties in acquisition of land, water, fuel, or other resources for operations of business.
- **Public Sentiment:** Current events playing out in the public scene can change the public sentiment.
- **Delay in execution of projects:** Delays in execution of projects can surge in the capex.
- **Increased number of recalls and quality audits:** Impacts both the brand equity and increased operational expenses.
- **Failed / Hostile Mergers & Acquisitions:** High dependence on inorganic growth.

Bottom-Up Risk Assessment Approach

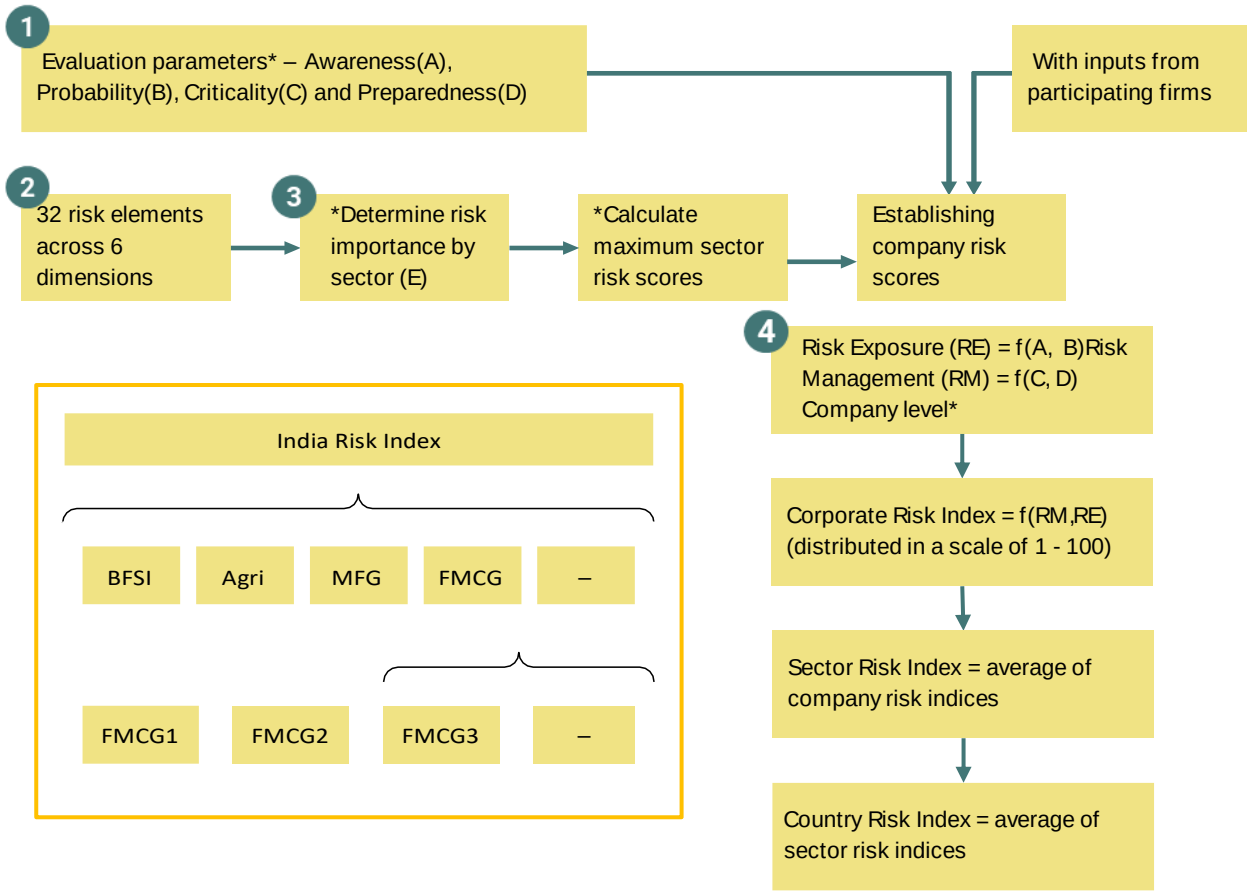


Figure 1: Risk Assessment Approach

1. **Evaluation Parameters*:** The index maps the risks faced by any enterprise basis of Awareness, Probability, Criticality and Preparedness against the defined Risk elements. The evaluation Parameters are defined as:

- Awareness - Level of awareness of potential risk affecting the firm.
- Probability - Likelihood of risk to affect the business goals of the firm adversely.
- Criticality - Level of impact of the identified risk on the success of business goals.
- Preparedness - Risk handling practices/ mechanisms already in place to handle the risk.

2. **Determining Risk Importance*:** Importance/Impact of individual risk element is established against individual sector based on the published corporate risk reports, in depth sector

understanding by F&S team and SMEs.

3. **Calculating Maximum Sector Risk Score**: Weighted Sum of all risk elements based on their importance to the respective sector.

4. **Company Level*:** All the Risk Index scores for companies in a sector are averaged to represent the sector; and sectors average to India. Risk Exposure is defined as the function of corporate's Risk Awareness and Probability of risk occurrence. Risk Management is defined as the function of an enterprise risk preparedness and criticality risk impact assessment.

Defining the Risk Scale

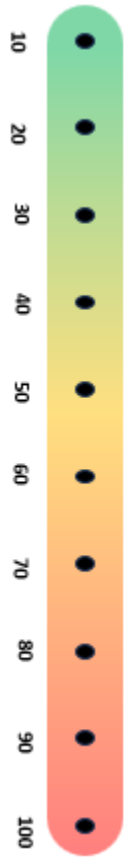
We have selected 20 sectors to understand the current stand of our country today in terms of risk. Risk for various sectors is measured on the risk exposure scale and risk management scale.

A. ICICI Lombard Corporate Risk Exposure – Scale

Risk Exposure: The impact of any internal, external or strategic occurrence on the financial performance of an organization is defined as the corporate risk exposure.

Risk has traditionally been seen as something to be avoided – with the belief that if behavior is risky, it's not something a business should pursue. But the very nature of business is to take risks to attain growth. Risk can be a creator of value and can play a unique role in driving business performance.

Let's look at the risk exposure scale.



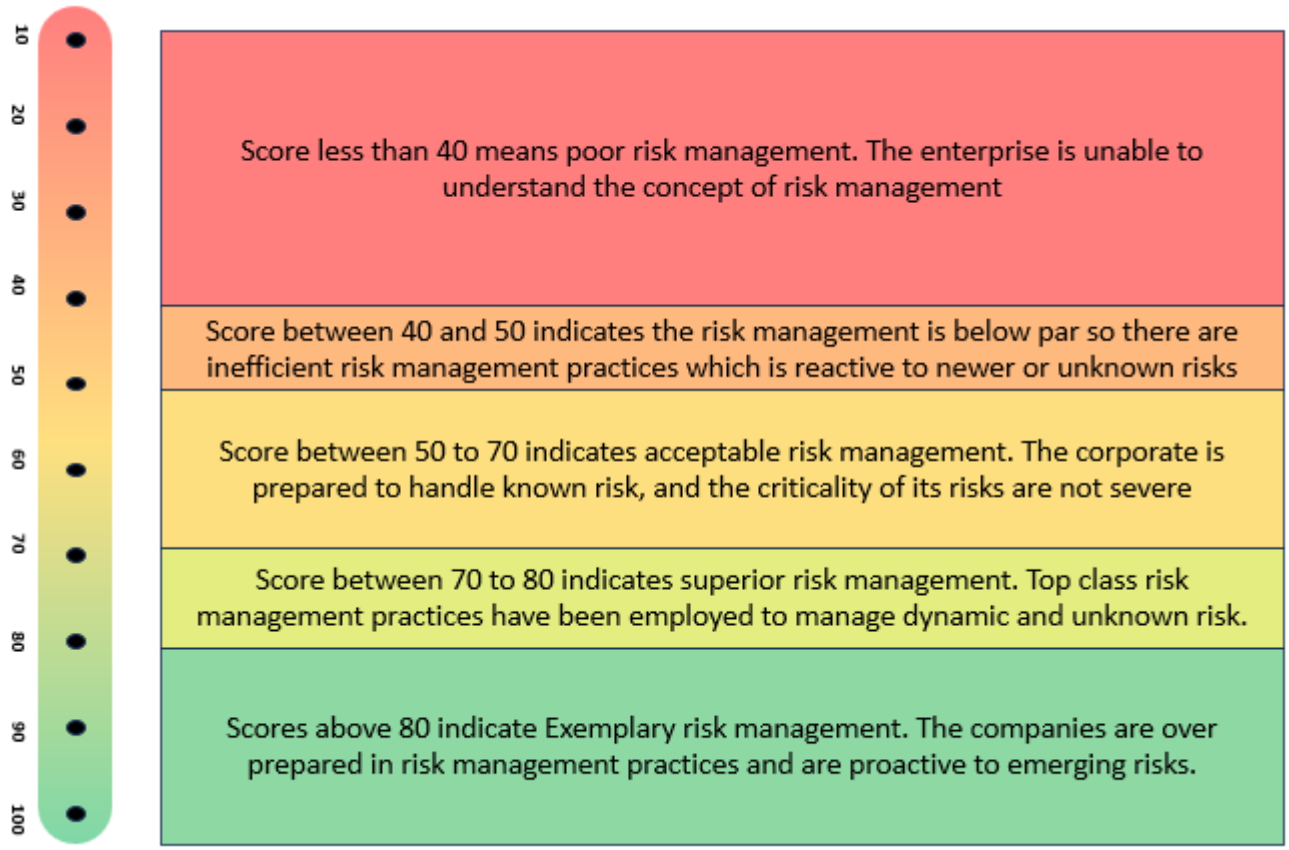
Score: If less than 30 means there is very low risk exposure, and the sector has minimal exposure to overall risk
Score between 30 to 50 indicates low risk exposure and its risk exposure is within acceptable or tolerable limits
Score between 50 to 60 indicates moderate exposure indicating corporate can balance the impact of overall risks up to a certain extent
Score between 60 to 80 indicates high risk exposure and its impact is very high in the industry in which the corporate operates
Score greater than 80 indicates very high-risk exposure. The corporate is unable to foresee risk incidents and probability of occurrence of these incidents may be extremely high

B. ICICI Lombard Corporate Risk Management – Scale

Risk Management: Identification, Evaluation and Prioritization of corporate risks followed by well- coordinated steps to minimize the occurrence of uncertainties in the foreseeable future is defined as the Corporate Risk Management.

The risk management scale works in the opposite to that of the risk exposure scale.

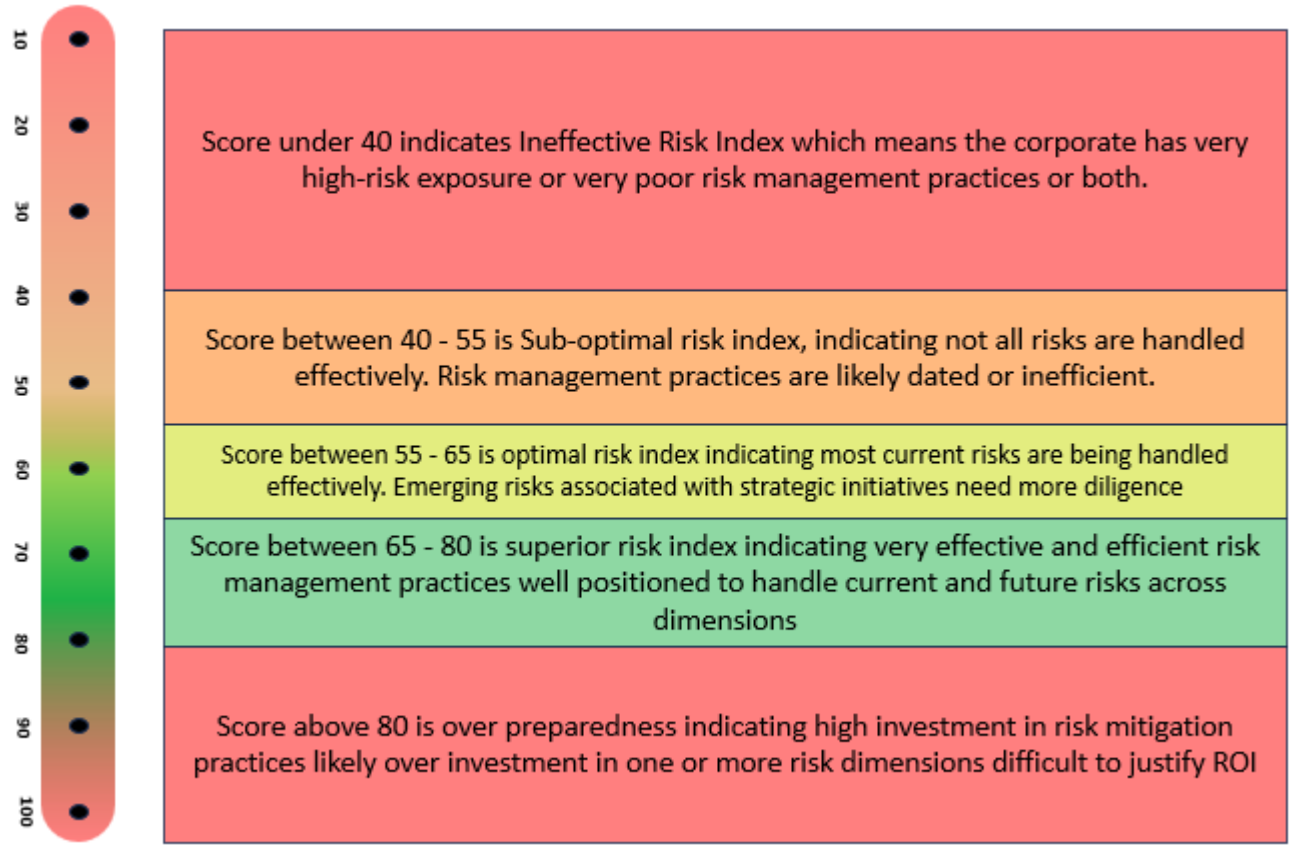
Let's look at the risk management scale.



c. ICICI Lombard Corporate Risk Index – Scale

Risk Index: Risk Index is a measurement tool to gauge the level of Risk Exposure against Risk Preparedness. The score intends to give companies/Sector/Country access to an extensive and quantifiable metrics of risk management.

Let's look at the risk Index scale.



India - Resilient Growth and Superior Risk Management

In 2024, India's diverse sectors demonstrated significant growth and resilience, leveraging technological advancements, strategic reforms, and proactive risk management to navigate an evolving economic landscape. Despite global challenges, industries embraced innovation, digital transformation, and sustainable practices, positioning themselves for long-term success.

In this year, the integration of Artificial Intelligence (AI) across various sectors presented both significant opportunities and risks. While AI-driven innovations enhanced productivity, decision-making, and customer engagement, the adoption also raised concerns around data privacy, cybersecurity, and workforce displacement. India navigated these risks by implementing robust data protection regulations and promoting AI ethics in the development and deployment of technology. Additionally, the government and private sector invested in reskilling programs, ensuring the workforce was equipped to adapt to the evolving digital landscape. AI's strategic implementation across sectors like BFSI, healthcare, and manufacturing helped India enhance operational efficiency while balancing the challenges posed by rapid technological transformation.

The Aerospace & Defence sector saw substantial advancements as India attracted global aerospace companies seeking to strengthen supply chains. Local firms expanded their capabilities, particularly in the growing private space sector, driving both revenue growth and global competitiveness. The Agri & Food Processing sector turned to precision farming and AI-driven analytics to enhance productivity, while renewable energy solutions like solar-powered cold storage reduced post-harvest losses, improving sustainability and efficiency.

In the Automotive sector, the shift toward electric vehicles (EVs) gained momentum, supported by government schemes aimed at promoting EV adoption. Major manufacturers expanded their EV portfolios, addressing both sustainability goals and evolving consumer demands. The BFSI sector continued its digital transformation, with AI integration enhancing fraud detection and compliance, further improving security and efficiency.

The Biotech & Lifesciences sector experienced accelerated growth, particularly in genomics and vaccine development, with India solidifying its role as a global leader in pharmaceutical manufacturing. The sector's innovation, supported by public and private investments, enhanced healthcare technology and medical devices. In Chemicals & Petrochemicals, India attracted significant investments to meet rising demand, driven by growing consumption from its expanding middle class, while the Education sector embraced AI and digital learning platforms, expanding access to quality education and equipping the workforce for future demands in emerging technologies.

The Energy sector made substantial progress towards sustainability, with a focus on renewable

energy, including ultra-mega solar parks and offshore wind projects. These initiatives were supported by favorable government policies and decreasing costs of clean energy technologies. The FMCG sector adapted to inflationary pressures by shifting focus towards premium products and e-commerce platforms, which were increasingly driving sales, particularly in rural markets.

In Healthcare, there was significant growth fueled by digital innovations such as telemedicine and AI-driven diagnostics, which helped improve access and efficiency in healthcare delivery. India also continued to strengthen its position as a global hub for medical tourism, offering competitive treatment options. The Real Estate sector benefitted from increased demand in affordable housing and infrastructure development, with commercial real estate seeing steady growth and an emphasis on sustainable building practices.

The IT sector continued to thrive despite global challenges, driven by demand for cloud services, cybersecurity solutions, and AI technologies. Tier 2 and 3 cities emerged as new tech hubs, with government support enhancing regional tech expansion. The Pharmaceutical sector saw an uptick in exports and domestic manufacturing, with reduced dependence on imports and new product launches in global markets bolstering its growth. In Manufacturing, India focused on boosting production through initiatives like the Production-Linked Incentive schemes, especially in electronics and EV manufacturing, which also contributed to job creation and supply chain resilience. The "China + 1" strategy adopted by global firms has played a pivotal role in shaping India's manufacturing sector. While it has increased risk exposure, it has also driven companies to invest in more sophisticated, globally relevant risk management practices, strengthening the sector's resilience and positioning India as a key player in global supply chains.

Media & Entertainment saw continued growth, with OTT platforms gaining popularity, especially in regional content. The Gaming industry also flourished, becoming a key revenue generator as mobile gaming gained dominance. In Steel and Mining, investments in decarbonization and digitalization allowed the sectors to reduce environmental impact and enhance operational efficiency. Startups saw substantial funding despite global slowdowns, with SaaS, fintech, and D2C brands leading the charge in innovation and market expansion.

The Telecom sector expanded 5G coverage and rural internet penetration, narrowing the digital divide and improving connectivity across the country. The Tourism & Hospitality sector rebounded strongly, attracting both domestic and international visitors, with eco-conscious travelers opting for sustainable tourism options and luxury experiences. Finally, the Logistics sector benefited from advancements in automation and multimodal connectivity, reducing costs and improving efficiency, while the government's National Logistics Policy streamlined operations, cutting transit times and enhancing cross-sector integration.

In summary, 2024 saw India's sectors display resilience and adaptability, addressing emerging risks through innovation, digital adoption, and sustainability initiatives. The country's ongoing focus on risk management, technological advancement, and strategic reforms has positioned its economy for continued growth and transformation, paving the way for India to solidify its place as a global economic leader.

India Showcasing an Optimized Risk Handling

Figure 2: Corporate India Risk Index 2024

A score of 65 on the Corporate Risk Index indicates optimal handling of risk by the Indian companies. In 2024, India faced significant market, economy, and operational risks across various sectors, highlighting areas for improvement in the coming years. The year was further complicated by global events such as the ongoing Israel-Palestine conflict, which led to geopolitical instability and fluctuations in global oil prices. The rise of recession fears in major economies like the United States and Europe disrupted supply chains and created demand uncertainties, impacting Indian exports and manufacturing. Investor sentiment in India remains flat in 2024, reflecting the cautious behavior of Angel and VC investors globally. This persistent challenge, which has carried over from 2023, highlights ongoing risks in the market and underscores the uncertainty that continues to affect investment decisions in the country.

Additionally, India's national elections increased risk exposure, with political uncertainty and policy shifts potentially affecting business operations, investor confidence, and sectoral reforms. These global and domestic challenges underscored the need for stronger risk management

frameworks and adaptive strategies across India's industries to navigate future uncertainties effectively.

In response to the heightened risks in 2024, companies across India have increasingly focused on strengthening their risk management frameworks. With the backdrop of global uncertainties, such as geopolitical conflicts and economic slowdowns, alongside domestic challenges like the national elections, businesses have prioritized proactive risk identification, mitigation strategies, and resilience-building measures. This shift reflects a broader trend of embedding risk management into corporate strategy, with an emphasis on agility, digital transformation, and sustainability.

As a result, sectoral risk indices have remained within the superior and optimal risk index range, demonstrating that most industries in India have effectively managed the challenges they faced. Through a combination of technological innovations, regulatory compliance, and strategic planning, sectors have been able to maintain stability and navigate both internal and external risks. This disciplined approach to risk management has ensured that, despite various pressures, India's sectors remained well-positioned for sustainable growth and continued progress in 2024.

Below is a broader categorization of sectors in terms of risk index:

Figure 3: Corporate India Risk Index 2024 Sector Score

Superior Risk Index

Superior risk handling was found in nine industrial sectors:, Pharmaceuticals, Healthcare Delivery, Automotive & Ancillary, Manufacturing, Metals & Mining, Telecom & Communication, BFSI, Tourism & Hospitality, and Transportation & Logistics.

Optimal Risk Index

Optimal risk handling was found in 11 industrial sectors: Media & Gaming, FMCG, Infra & Realty, Agriculture & Food processing, Biotech & Lifesciences, IT ITES, Energy, New Age & Startup, Aerospace & Defence, Chemicals & Petrochemicals and Education & Skill Development.

Metals & Mining Sector Insights 2024

Minerals and metals remain the foundation of industrial and economic activities, with demand rising due to infrastructure growth, clean energy transitions, and advancements in manufacturing. As India accelerates its efforts toward self-reliance in critical minerals, the mining sector is undergoing a transformative shift that will have far-reaching implications across industries such as construction, automobile, electronics, and power generation. The emphasis on sustainability, efficient resource utilization, and policy-driven reforms is reshaping the operational and regulatory landscape for mining companies.

The sector continues to be a key contributor to India's GDP, providing employment opportunities and driving economic activity in resource-rich states. However, mining operations are exposed to an array of risks, ranging from environmental challenges and regulatory changes to financial uncertainties and market volatility. These risks affect not only the profitability of companies but also have a broader impact on local communities and ecosystems. This report highlights the critical risks facing the mining and mineral sector in India, including regulatory compliance, resource security, operational hazards, and economic fluctuations.

Industries dependent on mining, including steel, cement, and power, have seen a surge in demand, reinforcing the sector's significance in India's economic framework. In FY 2024, India's mining output witnessed steady expansion, with coal production continuing its upward trajectory to support the country's energy security. The production of iron ore, bauxite, and emerging minerals such as lithium gained momentum, aligning with India's push toward strategic mineral exploration. The government's mineral block auctions progressed further, with key states such as Odisha and Chhattisgarh driving new allocations.

Commodity price fluctuations, global supply chain disruptions, and geopolitical uncertainties continue to impact the profitability of mining operations. Regulatory updates, including environmental norms and land acquisition policies, influence business strategies, necessitating proactive risk management to ensure operational resilience. While improvements in safety protocols have reduced workplace incidents, challenges such as mine collapses, equipment failures, and climate-induced disruptions still pose significant risks to business continuity.
Environmental concerns, particularly in terms of emissions, deforestation, and water resource depletion, have heightened regulatory scrutiny, prompting companies to adopt sustainable mining practices. Compliance with evolving ESG norms has become a priority, driving investments in green

technologies and rehabilitation measures.

Technological integration is playing a crucial role in improving productivity, with automation, AI-based exploration, and remote monitoring becoming more prevalent. However, the adoption of these technologies requires significant capital investment and workforce adaptation.
The sector remains vulnerable to climate risks, including heavy rainfall, landslides, and cyclones, which can disrupt operations and infrastructure. As a result, companies are increasingly focusing on disaster preparedness and resilience strategies to mitigate operational disruptions.

Mergers and acquisitions continue to shape the industry, enabling companies to expand resource access and integrate advanced mining technologies. However, these transactions come with risks related to financial due diligence, regulatory approvals, and post-merger integration.
In recent years, government reforms, such as amendments to the Mines and Minerals (Development and Regulation) Act, have facilitated ease of doing business and encouraged private sector participation. Looking ahead, India's mineral demand is projected to rise further, driven by infrastructure projects, industrial expansion, and the transition to renewable energy. The government's policy initiatives, including incentives for domestic exploration and increased foreign direct investment, will be critical in shaping the sector's future growth.

Metals & Mining Sector Risk Index 2024 Vs 2023

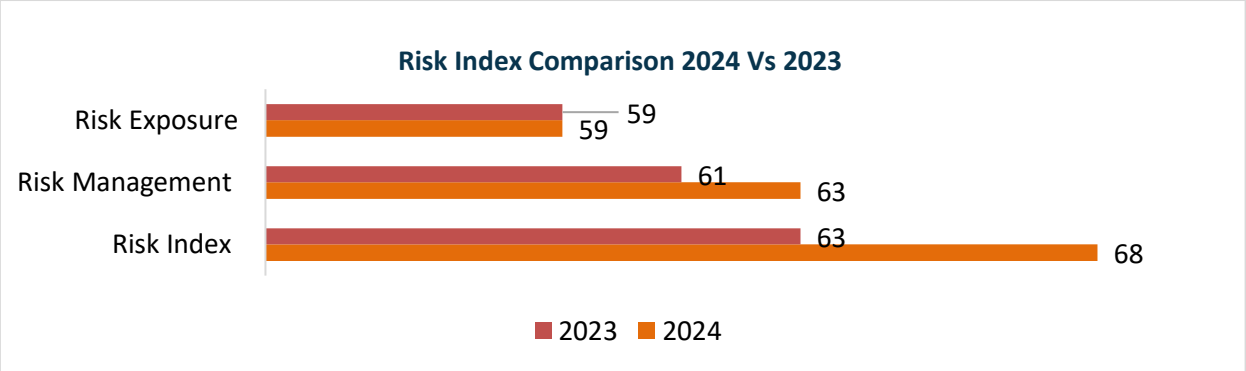


Figure 4: Detailed Comparative Analysis 2024 Vs. 2023

Metals & Mining Sector Risk Index 2024 Vs 2023

The overall Risk Index for the sector increased from 63 to 68 in 2024, owing to an increase in the risk management from 61 to 63 in 2024.

Metals & Mining Sector Risk Exposure 2024 Vs 2023

The risk exposure for India's metals and mining sector in 2024 remained consistent at 59 due to persistent external risks, such as geopolitical tensions and global supply chain disruptions. While there were efforts to mitigate some of these risks, challenges such as the ongoing volatility in commodity prices, resource scarcity, and regulatory complexities continued to put pressure on the sector. The need for critical minerals, including zinc, steel, and aluminum, remained high, and despite some diversification efforts, global market fluctuations and geopolitical tensions continued to expose the sector to risks. Additionally, environmental and land acquisition issues persisted, maintaining the overall exposure at similar levels.

Metals & Mining Sector Risk Management 2024 Vs 2023

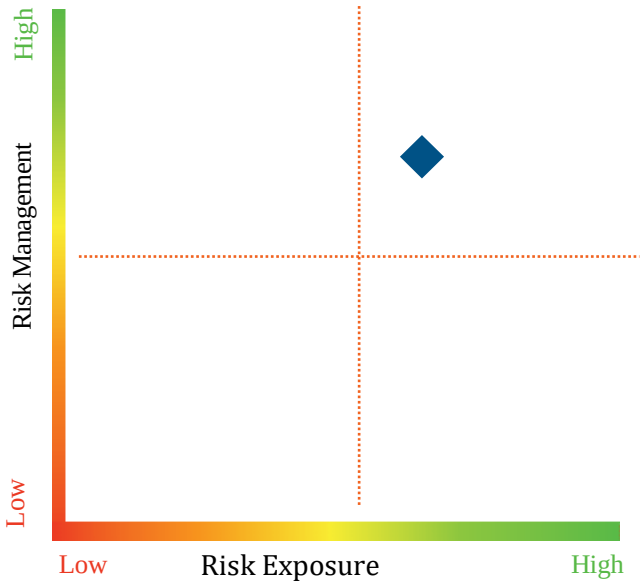
Risk management in the sector improved from 61 to 63, reflecting the proactive measures taken by companies to address the evolving risks. The sector made significant strides in adopting advanced technologies, such as AI, automation, and digital solutions, to enhance operational efficiency and risk forecasting. Companies also embraced sustainability strategies, including decarbonization efforts and circular economy practices, to reduce environmental and regulatory risks. Furthermore, with government support through initiatives like the "Atmanirbhar Bharat" campaign, which incentivized self-reliance and private sector participation, businesses strengthened their supply chain resilience.

Key Highlights

Risk Dimension Analysis: Market and Economy

Risk Exposure Score: 69

Risk Management Score: 69



Inflation

- Rising fuel and transportation costs significantly impacted mining operations, as diesel prices surged by nearly 10% in FY 2023-24. This led to higher excavation and material transport expenses, directly affecting the profitability of coal and iron ore mines, which rely heavily on large-scale fuel consumption.
- Equipment and spare parts procurement costs escalated due to global supply chain disruptions, with prices for heavy machinery components increasing by 8-12% compared to the previous year. Delays in importing key machinery parts from China and Germany further slowed down maintenance schedules, reducing operational efficiency.
- Wage inflation in the mining sector intensified due to skilled labor shortages, particularly in underground mining and mineral processing units. Salaries for specialized roles like geologists, mining engineers, and heavy equipment operators rose by 7-9%, increasing overall labor expenses for mining firms.
- Higher input costs for explosives and blasting materials added financial strain to miners, as ammonium nitrate prices fluctuated due to regulatory changes and supply shortages. With explosives accounting for a significant portion of operational costs, mining companies faced tighter profit margins and increased cost pressures.

Taxation Risk

- The increase in royalty rates for major minerals under the MMDR Act amendments in 2023-24 significantly raised operational costs, particularly for coal, iron ore, and bauxite miners. This put additional financial pressure on mining companies, leading to higher end-product prices and

impacting downstream industries.

- The coal cess under GST remained unchanged at ₹400 per ton, continuing to keep production costs elevated, particularly for private coal miners supplying to captive power plants. This directly affected electricity generation costs and profitability in coal-dependent thermal power sectors.
- Retrospective taxation disputes remained a major concern for international mining firms operating in India, with legal battles over tax claims delaying foreign investments. These ongoing disputes discouraged global mining corporations from expanding their operations in India.
- New compliance measures for transfer pricing in mineral exports increased scrutiny and regulatory compliance costs, particularly for firms engaged in cross-border sales of iron ore and rare earth minerals. Mining companies had to adjust their financial strategies to navigate the evolving taxation landscape.

Geopolitical Risks

- Supply chain disruptions from ongoing geopolitical conflicts, particularly in Russia-Ukraine, impacted coal imports, forcing Indian power plants and industrial consumers to seek alternative suppliers. This resulted in increased procurement costs and logistical challenges.
- Tensions between India and China led to prolonged delays in procuring advanced mining equipment and rare earth processing technologies, affecting production timelines and efficiency in mineral extraction projects. The mining industry struggled with technological stagnation due to limited access to critical machinery.
- Global sanctions on key mining markets disrupted trade routes for essential minerals, particularly in nickel and lithium supply chains critical for India's battery manufacturing sector. This created raw material shortages, impacting domestic electric vehicle (EV) and renewable energy industries.
- Increased global focus on critical mineral security led to new government policies favoring domestic extraction, but execution challenges slowed down the mining of rare minerals such as lithium, cobalt, and graphite. Despite policy support, infrastructure and processing capabilities remained inadequate.

Foreign Exchange Risk

- Volatility in the rupee-dollar exchange rate directly impacted the cost of imported mining equipment, as the depreciation of the rupee increased capital expenditure for large mining firms. This led to higher costs for acquiring essential machinery and maintenance parts, affecting production efficiency.
- Iron ore exports suffered due to fluctuating global demand and forex instability, as international buyers renegotiated contracts based on currency fluctuations in 2023-24. This uncertainty affected revenue streams for Indian exporters reliant on stable foreign exchange conditions.
- Import dependency on specialized mining machinery from China and Germany exposed Indian miners to currency exchange risks, making procurement costs unpredictable. Delays in payment

settlements due to forex fluctuations further complicated cash flow management for mining firms.

- Royalties and profit repatriation by foreign mining investors faced additional forex risks, with currency devaluation affecting revenue repatriation strategies. Companies had to adjust financial hedging mechanisms to mitigate potential losses.

Regulatory Risk

- Delays in obtaining environmental clearances for new mining projects disrupted expansion plans, as multiple coal and iron ore blocks awaited approvals in FY 2023-24. Lengthy approval processes led to project delays, impacting production targets and investor confidence.
- Amendments to the MMDR Act introduced stricter norms on mineral auctions, causing slower allocation of new mining leases and creating uncertainty for industry players. The new provisions emphasized transparency but also led to delays in project execution and lease renewals.
- Increased enforcement of sustainable mining practices resulted in higher compliance costs, with firms mandated to invest in green mining technologies, afforestation programs, and mine rehabilitation efforts. These regulatory measures, while necessary for environmental sustainability, added to operational costs.
- State governments imposed tighter restrictions on sand and minor mineral mining, affecting supply chains for the construction sector. Shortages in legally sourced raw materials led to price volatility, project delays, and increased reliance on illegal mining activities.

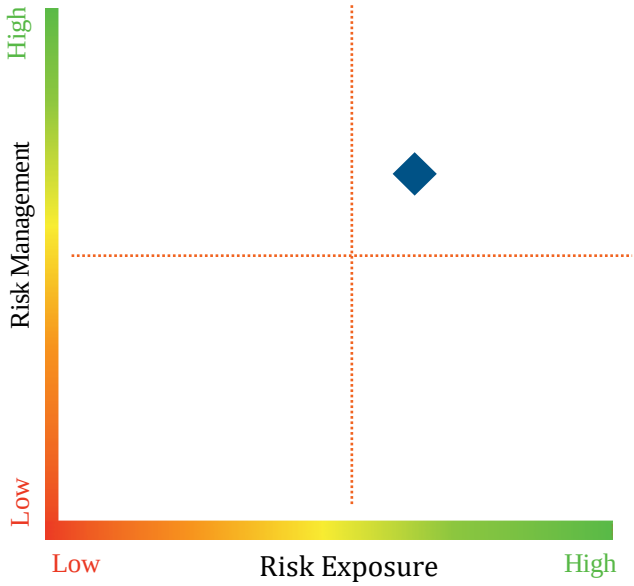
Competitive Risk

- The Indian mining sector saw increased competition from private players after the MMDR Act amendments allowed greater participation in mineral auctions. This led to aggressive bidding for coal, iron ore, and bauxite blocks, driving up acquisition costs and making profitability more challenging.
- State-run companies faced pressure from international mining firms entering the Indian market through joint ventures and strategic investments. Global firms leveraged advanced mining technology, automation, and superior cost efficiencies, posing a threat to domestic producers.
- The rise of sustainable mining practices increased competition among companies adopting eco-friendly extraction methods. Firms investing in low-emission technologies and green mining certifications gained preferential treatment in regulatory approvals, creating a competitive divide.
- Illegal and unregulated mining continued to threaten the organized sector by undercutting prices and bypassing compliance costs. Despite stricter enforcement, illegal extraction of minerals such as sand, iron ore, and limestone persisted, disrupting market dynamics.

Risk Dimension Analysis: Technology

Risk Exposure Score: 56

Risk Management Score: 62



Innovation Risk / Obsolete Technology

- Slow adoption of automation and digital mining technologies limited operational efficiency. Indian mining firms lagged in deploying AI-based exploration, automated drilling, and real-time monitoring, reducing productivity compared to global peers.
- Obsolete machinery led to higher maintenance costs and frequent breakdowns. Many underground mines continued using outdated equipment, increasing downtime and lowering overall output efficiency in 2023-24.
- Inadequate investment in research and development (R&D) reduced technological advancements. Unlike international competitors, Indian mining companies allocated minimal funds to developing innovative extraction and processing technologies, impacting long-term growth.
- Global push for green mining increased the risk of obsolescence for traditional extraction methods. Pressure to shift towards sustainable mining techniques meant companies relying on conventional high-emission processes risked losing competitiveness

Intellectual Property Risk

- Weak patent protection laws in India exposed mining firms to risks of intellectual property theft. Companies developing proprietary mineral processing techniques faced challenges in safeguarding their innovations from unauthorized replication.
- Dependence on foreign technology providers increased exposure to licensing disputes. Indian mining firms using imported drilling and extraction equipment had to navigate complex IP agreements, sometimes leading to legal conflicts over patent usage.
- Lack of domestic innovation in mineral processing made firms reliant on external R&D. Mining companies struggled to develop indigenous technology for refining rare earth elements, making them vulnerable to supply chain risks.
- Unauthorized data sharing of geological surveys raised concerns over resource security. Leaks of confidential exploration data posed risks of illegal exploitation of high-value mineral deposits by unauthorized entities.

Disruptive Technology

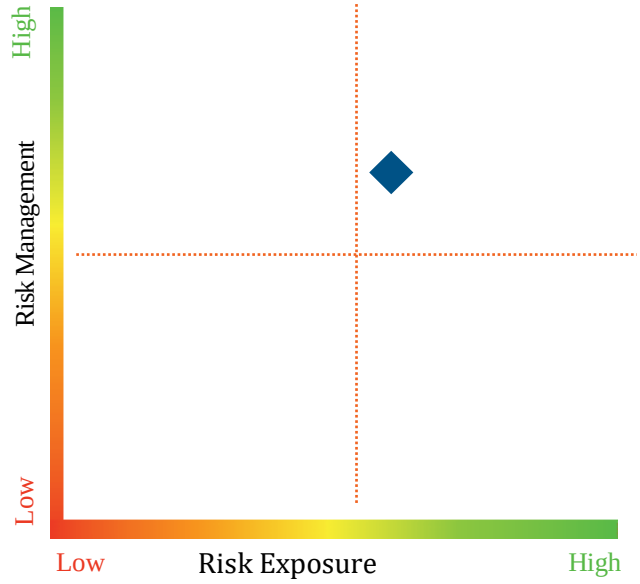
- Emerging green mining technologies threatened the viability of traditional operations. The rise of low-impact mineral extraction methods, such as bio-mining and deep-sea mining, created competition for firms relying on conventional open-pit and underground mining.
- The shift towards electric vehicles (EVs) reduced coal demand, impacting long-term planning. As major economies pushed for EV adoption, coal-based industries saw reduced demand forecasts, challenging mining companies to diversify into alternative minerals.
- Use of blockchain in mineral trading disrupted traditional supply chain models. Blockchain-based tracking of mineral origin gained traction, forcing mining companies to ensure greater transparency and compliance in mineral sourcing.
- AI-driven exploration reduced reliance on traditional geological surveys. Advanced AI models enabled faster and more accurate mineral discovery, benefiting tech-savvy firms while making conventional methods increasingly obsolete.

Data Compromises

- Increased cyberattacks on mining firms led to data breaches of sensitive operational information. In FY 2023-24, multiple cyber intrusions targeted Indian mining databases, exposing geological survey data and confidential trade contracts.
- Weak IT infrastructure in older mining firms increased exposure to hacking risks. Many companies continued using outdated security protocols, making them vulnerable to ransomware attacks and unauthorized access.
- Leakage of resource exploration data raised concerns about illegal mining. Unauthorized access to geological reports led to unregulated extraction of high-value minerals in some regions.
- Global mandates on data protection forced firms to upgrade security compliance. Stricter cybersecurity regulations required mining firms to enhance data encryption, access control, and compliance with international data governance laws.

Risk Dimension Analysis: Operational and Physical

Risk Exposure Score: 59
Risk Management Score: 61



Critical Infrastructure Failure / Machine Breakdown

- A shortage of spare parts for imported mining machinery led to extended downtime in large-scale mining operations. Supply chain disruptions from Germany and China delayed the procurement of essential components, affecting productivity and increasing maintenance costs.
- Frequent power outages in key mining states like Jharkhand, Odisha, and Chhattisgarh disrupted mineral extraction and processing activities. Many mines were forced to rely on expensive backup power sources, adding to operational expenses.
- Breakdowns in conveyor systems and ore processing units reduced production efficiency in large mines. Unplanned shutdowns in high-capacity iron ore and coal mines led to significant output losses and delays in fulfilling contractual obligations.
- Aging heavy equipment, including hydraulic shovels and draglines, increased maintenance costs and safety risks. Many mines continued to operate outdated machinery beyond their expected lifespan due to high replacement costs, elevating the risk of failures.

Business Continuity / Sustainability

- Extended delays in environmental clearances affected project viability, with several mining blocks remaining non-operational in FY 2023-24. Stringent compliance requirements for coal, bauxite, and rare earth element mines slowed down production and expansion.
- Climate change risks, including erratic rainfall and extreme temperatures, affected open-cast mining operations. Increased flooding incidents in coal mines during the monsoon season led to temporary shutdowns and financial losses for operators.
- Mining firms were required to spend a higher share of revenue on reclamation and sustainable development projects. Stricter government norms mandated increased investment in afforestation, water conservation, and biodiversity protection, impacting cost structures.
- Growing investor scrutiny over ESG (Environmental, Social, and Governance) compliance

influenced capital availability for mining companies. Firms with poor sustainability records faced challenges in securing funding from domestic and international financial institutions.

Supply Chain Risk

- Global supply chain disruptions led to delays in importing high-value mining equipment, extending project timelines. Indian mines relying on excavators, drilling rigs, and ore processing units from Europe and China faced increased lead times and inflated costs.
- Railway and port congestion caused logistical bottlenecks, delaying mineral transportation to domestic and export markets. Limited rail capacity in mineral-rich states like Odisha and Jharkhand created shipment backlogs, increasing delivery timelines for bulk commodities.
- Domestic coal and iron ore shortages forced dependent industries to seek alternative suppliers, impacting cost efficiency. Unpredictable supply fluctuations led to price instability, affecting downstream sectors like steel, cement, and power.
- Export bans on critical minerals like lithium and bauxite by key global suppliers created raw material scarcity for domestic industries. India's heavy reliance on imports for certain strategic minerals led to increased costs and production constraints.

Commodity Price Risk - Volatility in prices of raw materials

- Global coal price fluctuations affected the cost structures of Indian power and steel producers. International thermal coal prices varied between $120-$180 per metric ton in 2023-24, making procurement planning challenging.
- Iron ore price volatility impacted mining profitability, with NMDC revising ore prices multiple times in FY 2023-24. Domestic rates for high-grade iron ore fluctuated between ₹4,000-₹6,500 per ton, affecting contract stability and margins for mining firms.
- The nickel and lithium market saw high price instability due to supply chain disruptions and rising EV demand. Mining firms struggled with cost management as prices of battery minerals remained unpredictable, impacting the long-term viability of investments.
- Gold and precious metal mining companies faced fluctuating bullion prices, affecting investor sentiment and profitability. Gold prices hovered between ₹55,000-₹62,000 per 10 grams in 2023-24, making revenue forecasting difficult for exploration firms.

Portfolio Risk

- Mining companies with limited diversification faced revenue instability due to fluctuations in key mineral prices. Firms dependent solely on coal or iron ore suffered financial strain when global demand dipped, while those with a mix of base metals, rare earth elements, and industrial minerals saw better resilience.
- Government-imposed mining bans on certain regions affected companies relying on a single geographical location. In FY 2023-24, stricter environmental regulations in Goa and Karnataka led to temporary closures of iron ore and bauxite mines, impacting companies with high exposure

in these areas.

- Companies heavily reliant on exports faced market risks due to geopolitical tensions and shifting trade policies. The tightening of mineral export regulations in China and Indonesia forced Indian mining firms to realign their strategies and seek alternative buyers.
- Limited investment in new mineral exploration led to stagnation in resource expansion. Many companies focused on existing assets rather than high-risk exploration, reducing long-term growth potential and increasing dependence on current reserves.

Environmental Hazard Risk

- Increased scrutiny on air and water pollution in mining regions led to regulatory crackdowns. Coal mining areas in Jharkhand and Chhattisgarh saw stricter monitoring, with several firms facing fines for excessive particulate emissions and groundwater contamination.
- Heavy rainfall in monsoon-affected states caused mine flooding and operational disruptions. In 2023-24, Odisha and Assam witnessed significant flooding incidents that temporarily halted production in open-cast mines, leading to financial losses.
- The transition to green energy and reduced fossil fuel consumption led to higher sustainability requirements. Mining firms extracting coal and bauxite faced mounting pressure to offset carbon emissions through reforestation and sustainable mining practices.
- Public protests against environmentally damaging mining projects increased, causing project delays. In Maharashtra and Madhya Pradesh, opposition to new mining leases over deforestation concerns led to legal battles and deferred project approvals.

Workplace Accident

- Mining accidents due to unsafe working conditions continued to be a significant risk in 2023-24. Fatalities and injuries due to mine collapses, gas explosions, and machinery failures were reported in underground and open-cast mines, prompting government interventions.
- Lack of adequate safety training for contract workers increased the frequency of accidents. Many mines employed temporary labour without proper hazard awareness, leading to higher workplace casualties, particularly in high-risk underground operations.
- Insufficient emergency response systems in remote mining areas led to delayed medical intervention. Mines located in interior regions of Jharkhand and Chhattisgarh faced difficulties in providing immediate aid due to inadequate healthcare infrastructure.
- Stricter enforcement of occupational safety laws resulted in increased compliance costs. The Directorate General of Mines Safety (DGMS) imposed higher penalties on non-compliant firms, compelling companies to invest in advanced safety equipment and training programs.

Human Resource

- Shortage of skilled mining professionals due to low enrollment in mining engineering courses impacted talent availability. Many institutions reported declining interest in mining-related education, leading to a smaller pool of qualified engineers and geologists.

- High employee attrition in private mining firms led to operational inefficiencies. Skilled workers migrated to global mining hubs in Australia and Canada, where better pay and working conditions were offered, causing a talent drain in Indian firms.
- Automation and digitalization in mining operations led to workforce displacement concerns. The adoption of AI-driven exploration, autonomous drilling rigs, and remote monitoring systems reduced demand for manual labor, triggering resistance from labor unions.
- Increased regulatory scrutiny on labor welfare forced companies to enhance employee benefits. Mining firms had to invest in better housing, healthcare, and safety measures to comply with labor laws, adding to operational costs.

Financial Risk

- Volatile commodity prices affected cash flow stability for mining firms in 2023-24. Companies relying on coal, iron ore, and aluminium faced unpredictable revenue cycles due to fluctuating global demand and pricing.
- Rising interest rates increased borrowing costs for capital-intensive mining projects. The RBI's monetary tightening policy led to higher financing expenses for expansion projects, making it difficult for companies to secure affordable loans.
- Mining firms with high debt burdens faced refinancing challenges amid tightened credit conditions. Companies with leveraged balance sheets struggled to restructure loans, increasing financial stress and impacting expansion plans.
- Delay in government payments for coal and mineral supply contracts affected liquidity. State-owned enterprises like CIL experienced cash flow mismatches due to delayed dues from power and steel companies, affecting working capital management.

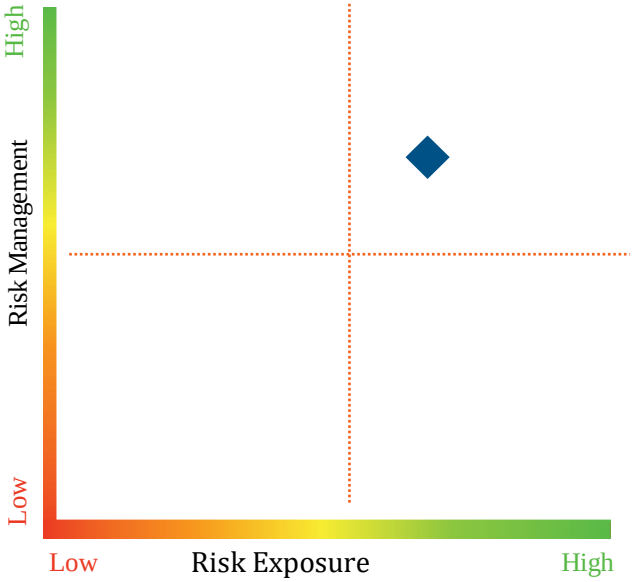
Breaches of law (local/ international)

- Increased enforcement of environmental laws led to legal actions against mining companies. In FY 2023-24, several firms faced penalties for non-compliance with forest clearance and pollution control norms, particularly in coal mining regions of Odisha and Jharkhand.
- Illegal mining activities resulted in regulatory crackdowns and asset seizures. Cases of unauthorized mineral extraction, particularly in Karnataka and Goa, led to stricter government oversight, with multiple licenses suspended due to violations.
- Stronger anti-corruption measures impacted the ease of obtaining mining permits. With stricter vigilance by agencies such as the Central Vigilance Commission, mining firms had to ensure higher transparency in regulatory dealings, slowing down approval processes.
- International trade disputes over critical minerals created legal hurdles for exporters. Indian mining firms exporting iron ore and bauxite to China and the EU faced stricter compliance requirements due to changing global trade laws and sustainability standards.

Risk Dimension Analysis: Crime and Security

Risk Exposure Score: 52

Risk Management Score: 59



Cyber-crimes

- Increased cyberattacks targeted mining firms' operational and financial systems. In 2023-24, several Indian mining companies faced ransomware attacks, disrupting production data and financial transactions, with losses reported in iron ore and coal mining firms.
- Weak cybersecurity measures in legacy systems made firms vulnerable. Many mining companies still relied on outdated IT infrastructure, making them susceptible to phishing and malware attacks targeting confidential contracts and geological data.
- Espionage attempts on rare earth mining firms raised data security concerns. As India expanded its rare earth extraction, foreign cyber threats attempted to infiltrate systems to gain access to strategic mineral exploration data.
- Regulatory push for cybersecurity compliance increased operational costs. The government mandated stricter IT security standards, requiring mining firms to invest in cybersecurity frameworks to prevent data theft and cyber fraud.

Counterfeiting

- Rising counterfeit mining equipment increased safety and operational risks. Substandard and fake spare parts infiltrated the supply chain, leading to machine failures and accidents, especially in underground coal mines.
- Illegal trade in counterfeit minerals impacted pricing and brand reputation. Fake iron ore and low-grade coal were sold under premium labels, affecting export credibility and market stability for genuine mining firms.
- Weak enforcement of anti-counterfeiting laws enabled illicit trade. Despite government efforts, gaps in monitoring and tracking allowed the circulation of counterfeit mineral products in domestic and international markets.
- Technological interventions in mineral authentication remained limited. The adoption of blockchain and AI for tracking mineral authenticity remained slow, allowing fraudulent transactions and unauthorized mineral mixing.

Threat to Women Security

- Limited security measures in mining sites raised concerns over workforce safety. In FY 2023-24, reports of harassment and unsafe working conditions in remote mining sites discouraged female workforce participation.
- Lack of women-friendly policies in mining firms restricted gender diversity. Most large mining companies had minimal provisions for gender-inclusive facilities, limiting employment opportunities for women in technical and operational roles.
- Remote mining locations posed higher risks of gender-based violence. The absence of proper surveillance and grievance mechanisms in distant sites made it challenging to ensure a safe working environment.
- Slow implementation of legal mandates on workplace safety created compliance risks. Despite existing laws on women's safety at workplaces, enforcement in the mining sector remained weak, increasing reputational and legal liabilities for companies.

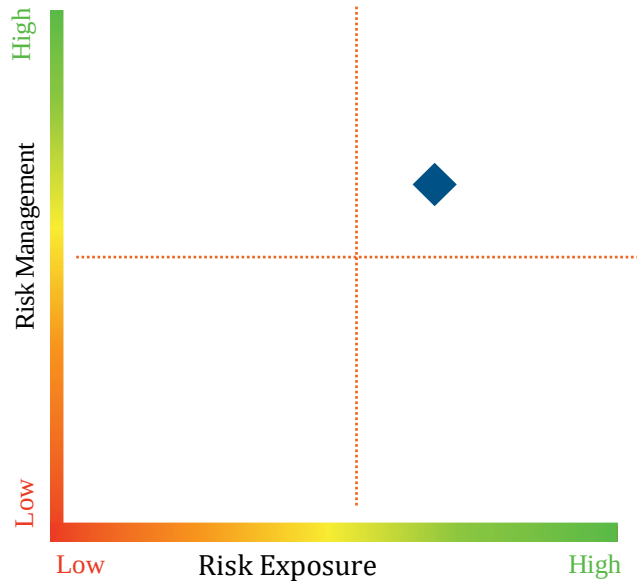
Terrorism

- Bribery in mining license approvals remained a challenge despite regulatory scrutiny. Reports in 2023-24 indicated delays in obtaining mining clearances due to corruption in land acquisition and permit allocation processes.
- Illegal mining networks continued to exploit regulatory loopholes. Despite government crackdowns, unauthorized mineral extraction persisted in iron ore-rich states, leading to revenue losses for legal miners.
- Procurement fraud in mining contracts inflated project costs. Over-invoicing and manipulation of tenders in equipment and logistics contracts resulted in financial losses and project delays.
- Increased digitalization of processes reduced corruption risks but faced resistance. Efforts to introduce e-auctions and digital tracking for mining permits faced opposition from traditional intermediaries benefiting from opaque processes.

Risk Dimension Analysis: Natural Hazard and Event

Risk Exposure Score: 55

Risk Management Score: 59



Natural Hazards like flood, drought, famine, earthquake, landslide etc

- Landslides and flooding disrupted mining operations in key regions. Heavy monsoons in 2023-24 led to mine collapses in coal and limestone sites in Jharkhand and Chhattisgarh, causing production halts and safety concerns.
- Rising temperatures and drought conditions impacted water-intensive mining processes. Extreme heat waves and water shortages affected ore washing and mineral processing units, particularly in central and western India.
- Seismic activities in mining belts increased safety and structural risks. Several states, including Odisha and Meghalaya, recorded minor tremors near mining zones, raising concerns over underground mine stability.

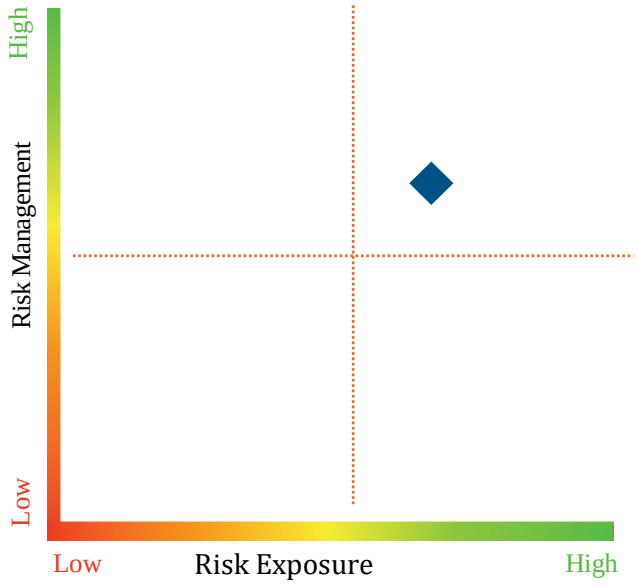
Pandemic and other Global Epidemic Diseases

- Post-pandemic supply chain disruptions continued to impact mining operations. Although COVID-19 restrictions were lifted, logistical bottlenecks and workforce shortages still affected production efficiency, particularly in coal and iron ore mining.
- Health vulnerabilities in mining communities increased operational risks. Mining areas with limited healthcare access remained highly susceptible to disease outbreaks, affecting workforce availability and productivity.
- New regulatory health compliance requirements raised operational costs. The government mandated stricter health and hygiene standards at mining sites, requiring companies to invest in sanitation, vaccinations, and medical infrastructure.
- Global disease outbreaks disrupted raw material imports for mining equipment. Epidemics in key supplier countries, such as China and South Africa, led to delays in the procurement of essential mining machinery and spare parts.

Risk Dimension Analysis: Strategic Risk

Risk Exposure Score: 56

Risk Management Score: 60



Resource scarcity / Misutilization / Overall Utilization

- Rapid depletion of high-grade mineral reserves increased extraction costs. In 2023-24, many mining firms struggled to maintain profit margins due to the rising cost of extracting lower-grade ores.
- Inefficient resource utilization led to increased waste generation. Poor mineral recovery rates and inadequate recycling practices resulted in higher waste accumulation, particularly in coal and bauxite mining.
- Water shortages in key mining states threatened sustainability. States like Rajasthan and Karnataka faced severe water crises, impacting mineral processing units that rely on large water inputs.
- Government pressure for sustainable mining forced firms to adopt stricter conservation measures. Companies had to invest in energy-efficient technologies and waste reduction initiatives to meet new environmental compliance standards

Public Sentiments

- Rising opposition to mining projects led to delays and legal challenges. In 2023-24, several new mining projects faced protests over environmental and displacement concerns, delaying government approvals.
- Increased media scrutiny on environmental impact damaged industry reputation. Reports on deforestation, pollution, and displacement due to mining projects led to negative public perception, forcing companies to improve ESG compliance.
- Social media campaigns fueled resistance against mining expansion. Activists and local communities used digital platforms to amplify concerns about land acquisition and pollution, pressuring policymakers and investors.
- Companies had to strengthen CSR initiatives to improve public trust. Mining firms increasingly invested in community welfare programs, such as local employment and infrastructure development, to mitigate public opposition.

Delay in Execution of Projects

- Environmental and land acquisition hurdles slowed down mining expansions. In FY 2023-24, several large-scale mining projects faced delays due to prolonged environmental clearances and land disputes.
- Lack of skilled workforce and technology adoption extended project timelines. Mining firms struggled to hire specialized labor and implement digital solutions, leading to inefficiencies in project execution.
- Infrastructure bottlenecks affected timely completion of mining projects. Poor road and rail connectivity in remote mining areas caused logistical challenges, delaying the transportation of extracted minerals.

Increased Number of Recalls and Quality Audits

- Rising scrutiny of mineral exports led to an increase in quality audits. In 2023-24, global buyers, particularly in the EU and China, imposed stricter quality requirements on Indian mineral exports, leading to frequent inspections and compliance checks.
- Stricter environmental and safety regulations intensified domestic quality audits. Indian authorities tightened monitoring on coal and metal mining operations, increasing on-site inspections to ensure adherence to pollution control and worker safety norms.
- Instances of substandard mineral processing resulted in product recalls. Several mining firms faced recalls due to excessive impurity levels in iron ore and bauxite shipments, affecting credibility and financial performance.
- Failure to meet new ESG (Environmental, Social, and Governance) standards led to rejections. Mining companies that did not comply with sustainability criteria faced export restrictions and lost contracts with international buyers.

Failed / Hostile Mergers & Acquisitions

- Regulatory hurdles complicated M&A activities in the mining sector. In 2023-24, government restrictions on foreign direct investment (FDI) in critical mineral mining slowed acquisition deals, reducing sector consolidation opportunities.
- Financial distress among mid-sized mining companies increased M&A failures. Several merger attempts collapsed due to liquidity constraints and high debt burdens in firms struggling to recover from COVID-19-induced slowdowns.
- Geopolitical tensions impacted cross-border mining deals. Strained relations with China, a key player in the global mining supply chain, disrupted planned acquisitions and joint ventures.
- Diverging ESG commitments led to failed negotiations. Investors increasingly prioritized sustainability, leading to M&A rejections where target companies had weak environmental or social responsibility records.

ICICI LOMBARD: Key Solution Offerings

Property

Evaluation of various risks to understand areas for improvement, such as fire preparedness, electrical safety, safety & emergency preparedness, maintenance and house-keeping, etc. By evaluating risks, we can identify potential hazards and advise on mitigating risks.

- **Property Loss Prevention:** We believe users should carry out detail risk visit followed by benchmarking of the industry good practices (Industry Risk Profiling). For instance, industries such as chemicals & petrochemicals impose a major challenge in manufacturing due to inherent risk. We recommend solutions for "Low Focus - High Loss Areas. This can help in minimizing severity losses. All the risk recommendations are grouped into four different segments based on cost-impact matrix and the priority is decided accordingly. Key decision makers at user's end can ensure to get recommendations implemented.
- **Comprehensive Risk Assessment (CRA):** A Comprehensive Risk Assessment is a systematic approach to electrical safety specially designed for industries to evaluate potential hazards and recommend improvements, coupled with savings. It is an important tool for identifying risks, severity of hazards and avoid incidents arising out of electrical faults.
- **Electrical Risk Assessment (ERA):** An Electrical Risk Assessment is a basic solutions focused towards electrical safety designed to evaluate potential hazards and recommend improvements. Majority of fires in India are caused due to electrical installations. Ensuring safety of electrical installations of industrial unit or organization is critical to reduce risk and ensure safety compliance with Safety Standards and Regulation. ERA is an important tool which have 6 inbuilt solutions such as Electrical Audit & Thermography, etc.
- **Fire Hydrant IoT:** Fire Hydrant IoT: Fire hydrant IOT (ILGIC Patented Solution) is an automated device for monitoring key parameters such as Hydrant and Sprinkler line pressure, Main and Jockey pump on-off status, Firewater tank level. These can be interpreted to provide intelligence on unauthorized usage of water and leakage, effectively saving water. This information pertaining to breach of above-mentioned parameters is notified through dashboard & email alerts. Monitoring of such system is essential as these fire fighting systems are lifeline during any emergency.
- **Temperature & Humidity IoT:** Provides end-to-end plug & play ambient temperature and humidity monitoring Solution to manage temperature and humidity-controlled environment more efficiently. It generates - Automated reports (historical trends for different locations etc.). Intelligent Alerts - SMS & emails is sent to the concerned (one or multiple) stakeholders in case

any anomaly.

- **Electrical IoT:** Electrical IoT is a patented solution (ILGIC Patented Solution) to avoid any instances of short circuiting due to abnormal voltage & current conditions. These are mainly built for application in warehouses. This solution has been created as these locations are having huge stocks with lesser manpower during emergencies mainly during non-business hours. The device automatically cuts off power in case of abnormality & restarts back when situation is normal.
- **Ultrasound technology for Gas Leak Detection:** Use of ultrasound technology for leak detection in process lines. The methodology recommends a non-destructive way of avoiding losses with no downtime. The main objective is to identify the leakages in all pressurized systems including pipelines by using ultrasound technology and tag them for rectification. It also includes listing leaks with individual CFM losses and cost savings possible.
- **Fire Mitigation Solutions:** Solutions have been designed based on their specific needs, keeping in mind the level of awareness and complexity of the location. These best-in-class solutions which are installed at correct locations.
- **Renewable Solutions:** In line with our philosophy of recommending business solutions, we recommend efficiency measurements for wind and solar power generating assets. Drones are used to provide high accuracy and quick reach which is not possible through any traditional methodology. User get to know about the low performing module and ways to improve the same within the entire solar plant with latlong identification. We recommend advanced drone-based technology for inspection of wind turbines and solar PV modules.

Marine

In the dynamic realm of marine insurance, cargo faces a myriad of risks, from unpredictable weather conditions to unforeseen accidents, safeguarding against potential challenges at sea and in surface transportation / INLAND movement is paramount.

- **MLCE (Marine loss control engineering):** Frequent occurring losses due to Peril such as accident, wet damage, theft, non-delivery, pilferage, hijack of consignments, mishandling shall be examined with ground inspections, to determine root cause analysis with MIS, claim assessment reports collectively in the form of logistics audit.
- **MWS (Marine warranty surveys):** Our inhouse practices of condition survey prior risk inception & post risk inceptions helps our customers to have an independent risk management of the high value / ODC (over dimensional cargo) movements conducted by the Insured so that reliance over logistics service provider is supervised with Insured's nominated risk assessment team having a worldwide presence with a supervised network. Not only marine cargo, but HULL insurance risk exposures are surveyed for risk assessment and risk management.
- **Technical engagements:** Uncertainty of the risk associated with the transit can be concluded

with marine experts. Assessing vessel's condition for SEA transit as a full chartered load on behalf of the Insured, Risk assessment of cargo from packing, handling, lifting, securing, transit and final delivery methodology shall be discussed with the logistics team. Vessel selection, stowage and securing methods can be jointly discussed with the User's logistics team for a safe transit, dispatch and delivery coverage after assessing the risk on desktop with a virtual or F2F engagement and / or a ground visit.

- **Transit Telematics:** With the government's constant agenda of upgrading to digitalized operations by introducing ULIP and NITI Aayog mode of operations, not having a visibility of transit will hamper your logistics operations. IOT and SAAS (software as a service) based products incorporating the design of a cost efficiency and loss mitigation system can help enhance delivery with safe operation. Additionally, a 24*7 risk control is recommended to effectively monitor and mitigate theft / pilferage prone dispatches to ensure a safe transit delivery. Be it a temperature-controlled cargo, expensive cargo in transit or liquid bulk cargo in lorry tankers, it is essential to mitigate the risk and losses that might occur due to accidents caused by fatigue, unexplained conditions, or theft. We have case studies of successful recovery of stolen goods with our telematics services.

Liability

The growing adoption of technology in organizations has not only led to crucial data being stored and processed on digital platforms but also facilitated the automation of operations, thereby enhancing business efficiency. However, this shift also amplifies cyber risk, exposing sensitive information to potential threats and rendering organizations vulnerable to financial losses, reputational damage, and legal liabilities. As organizations delve deeper into the digital realm, fortifying cybersecurity measures becomes imperative to safeguard operational integrity and protect critical data from unauthorized access or breaches.

- **Phishing Simulation:** Experience cutting-edge phishing simulation tests to fortify your organization's defenses against cyber threats. You can enable phishing attack simulations to educate your employees on identifying and handling potential risks. Through engaging and interactive scenarios, you can raise awareness and equip your team with the necessary skills to detect and thwart phishing attempts.
- **Awareness Campaigns:** With Cyber Awareness Campaigns, you can go beyond just educating organizations about cybersecurity. The campaigns are meticulously designed to empower your team with essential best practices, insights into global incident trends and a comprehensive understanding of potential risks. Interactive designs help you captivate and engage your employees, fostering a cyber-aware culture within your organization. Customized campaigns can perfectly align with your unique needs and requirements and stay informed and vigilant.
- **Incident Response and Readiness:** A bespoke service that fortifies organizations with robust processes and clear communication channels for proficient cyber-incident management. This

recommendation not only trims down the incident response time but also facilitates prompt, accurate action within the crucial initial hours. By meticulously assessing your organization's incident response policies and sculpting response systems in alignment with global industry benchmarks, this ensures you are thoroughly prepared to tackle the evolving digital threat landscape.

- **CXO's Session:** CXO's Session service provides immersive training sessions, personalized coaching & interactive discussions to empower your CXOs with cybersecurity knowledge that aligns with your business objectives. The subject matter experts recommend strategic guidance and in-depth insights into the ever-evolving threat landscape, translating technical jargon into practical language. Regular cybersecurity forums facilitate peer-to-peer learning and benchmarking against industry standards. CXO- focused approach ensures a cyber-aware leadership team that drives your organization's success securely into the future.
- **Weekly Threat Intelligence Bulletin:** Stay ahead of cyber threats with the Weekly Threat Intelligence Bulletin. We meticulously curate this comprehensive bulletin, providing timely insights on emerging threats, vulnerabilities, and attack trends. Delivered directly to your inbox, it recommends proactive advantage by promptly identifying potential risks. With continuous updates and ongoing support, you can confidently adapt your Defence strategies to combat the most sophisticated threats. It enables you to make informed decisions and protect your organization from emerging threats with Weekly Threat Intelligence Bulletin.
- **Email Security:** Safeguard your organization's communication channels with the Email Security solutions. We recommend robust measures to protect against phishing, malware & other email-borne threats. The advanced email filtering and authentication technologies prevent malicious emails from reaching your users inbox. Implementing encryption protocols to ensure the confidentiality of sensitive data in transit is a good idea. With real-time monitoring and threat intelligence, email security measures provide proactive Defence, detecting and blocking suspicious activities promptly. You can protect your organization's reputation and sensitive information with comprehensive Email Security measures, ensuring a secure and reliable email environment.
- **Agent-less Patching:** Agent-less patching platform for companies and MSMEs who want a rapid solution to distribute critical security updates and vulnerability fixes without causing system downtime. The patching platform not only assists with patch deployment, but it also enables your system administrator in understanding the patches, Adjustments & impact of the patches on the system. Before applying the patch, the software generates a warning if the system requires downtime or a reboot. You can experience a hassle-free patching process with the platform recommending enhanced security for your organization.
- **EDR/MDR Services:** Elevate your organization's cybersecurity capabilities with the Endpoint Detection and Response (EDR) and Managed Detection and Response (MDR) services. These advanced solutions provide continuous monitoring, rapid threat detection & effective incident response, safeguarding your digital assets in real-time. With EDR, proactively detect and

respond to threats at the endpoint level, while MDR service offers 24/7 monitoring and expert support. You can strengthen defenses against the most sophisticated cyber-attacks with EDR/MDR services, ensuring a resilient and secure digital environment.

- **All-in-one Operating System:** All-in-One Operating System is a true game-changing platform that provides a fortified desktop environment to foster secure collaboration and centrally managed cybersecurity resilience. Inbuilt endpoint security serves as a vigilant guard, blocking potential dangers. Effortless IT management provides with a user-friendly interface, leading to significant cost savings in IT infrastructure. It provides in-built end-point security, automated updates and patches along with extensive device reports. Organizations can unlock a secure and prosperous future by embracing the All-in-One Operating System in their IT infrastructure.
- **Cyber Risk Management & Compliance Dashboard:** Gain a clear understanding of your organization's cyber risk exposure with Cyber Risk Management & Compliance Dashboard. This powerful tool assesses your risk posture, quantifies potential financial Impact & evaluates compliance with industry standards and regulations. Armed with this information you can make informed decisions to prioritize cybersecurity investments and ensure compliance with relevant laws and regulations. The intuitive dashboard provides a comprehensive view of your cybersecurity performance enabling data-driven decision-making. This solution enables organizations to stay ahead of threats and ensure a resilient cybersecurity posture.
- **Security Score Card:** Track your organization's cybersecurity performance with a dynamic Security Score Card solution. This comprehensive rating provides a clear overview of your security posture, highlighting areas that require attention and improvement. It empowers data-driven decisions, allowing you to focus on strengthening key areas. Identify potential risks and compliance gaps with industry standards and regulations. With actionable insights, you can prioritize cybersecurity investments effectively, ensuring a robust and resilient Defence against cyber threats. This Security Score Card solution can be your strategic tool to proactively elevate your cybersecurity posture.
- **VAPT:** Enhance your organization's cybersecurity defenses with the Vulnerability Assessment and Penetration Testing (VAPT) service. Skilled professionals conduct rigorous assessments, simulating real-world attacks to identify potential vulnerabilities in your digital infrastructure. With detailed insights, you can fortify your defenses and proactively address weak points before malicious actors exploit them. This service goes beyond identifying vulnerabilities, you also get actionable recommendations to mitigate risks effectively. Organizations can be one step ahead of cyber threats, ensuring the security and resilience of your critical assets with the comprehensive VAPT service.

Engineering

In engineering risk management, it's vital to adopt a holistic approach that extends beyond immediate concerns to proactively tackle potential risks and uncertainties. Drawing upon

considerable expertise in claims handling and risk evaluation, a robust and customized protection strategy can be ensured.

Construction endeavors face a myriad of risks such as floods, cyclones, impact damage, fires, theft, and collapse. However, the adverse effects of these risks can be mitigated through the implementation of extensive loss prevention measures specifically tailored for engineering projects.

- **Engineering Loss Prevention Exercise (ELP):** To effectively manage losses in Engineering Risk, fostering a culture of loss prevention is crucial. It's widely acknowledged that each construction project is distinct, presenting specific challenges related to geography, geology, occupancy, and construction methodology, which in turn result in unique associated risks. To cater this challenge a specific risk management framework which deals about the unique requirement of each project could be created for the loss prevention with reference to some parameters of distinctive research and industries best practices.
- **Drone Solutions for Linear Projects:** In recent years, the construction industry has undergone significant changes due to the introduction of drone-based construction solutions. These cutting-edge technologies are transforming the planning, design, and execution of construction projects. A major benefit of drone technology in construction is its capacity to conduct aerial surveys, providing extensive coverage and detail. Drones, equipped with advanced cameras and sensors, can rapidly capture precise images and data, offering project managers valuable insights into site conditions. This data can facilitate project planning, cost estimation and design optimization by providing a comprehensive understanding of the project's parameters.
- **CPM - Fleet & Fuel Management:** An advanced GPS-equipped sensor is available to precisely measure direct fuel consumption, evaluate engine efficiency, and detect potential tampering of diesel engines in both mobile vehicles and stationary machinery. This solution enables real-time alerts for service reminders and critical health issues, facilitating prompt resolutions and enhanced utilization. Additionally, it offers valuable insights into machinery and equipment performance through comprehensive analyses, resulting in optimized inventory usage and increased efficiency.

Health

We highly recommend exploring proactive and preventive healthcare solutions, which can make a significant difference in maintaining good health. Recognizing that majority of in-patient department (IPD) admissions could be prevented with timely interventions and regular healthcare, it is important to focus on health, not just during illness.

- **Pioneering Digital Platform:** We recommend exploring digital health innovations offered by industry leaders, which provide cutting edge health solutions through the IL TakeCare (ILTC) app. Our platform has transformed the way health services are delivered by introducing a fully digital and cashless Outpatient Department (OPD) and Wellness Program.

- **Health Advisory Services:** We recommend a suite of health advisory services on the IL TakeCare app. Users can access health risk assessments, diet and exercise trackers, health parameter tracking and trends and sleep, meditation & hydration reminders. In addition, the platform recommends a feature to upload health records up to 1GB, and provides informative health blogs.
- **IL TakeCare App:** IL TakeCare app is a One-Stop-Solution for users with insurance needs. This robust user engagement is a testament to the high-value features that the app provides. Unique to the app is the innovative self-health assessment feature, which includes Face scan technology that can measure blood pressure, heart rate, cardiac variance, and SpO2 levels. The platform provides seamless teleconsultations with medical practitioners and specialists, and even recommends access to mental wellness experts to the insured. The facility for cashless OPD services and the efficient claim settlement process further enhance user experience. By encapsulating a wide range of state-of-the-art health services and solutions, the IL TakeCare platform revolutionizes corporate health management and serves as a comprehensive digital health solution.

Bibliography

Mines Cover_English_2023_24.cdr

Press Release: Press Information Bureau

Ministry of Coal, Government of India

Indian Bureau of Mines,Nagpur

Production 2024

Mining 2025 - India | Global Practice Guides | Chambers and Partners

Mine 2024: Preparing for impact | PwC

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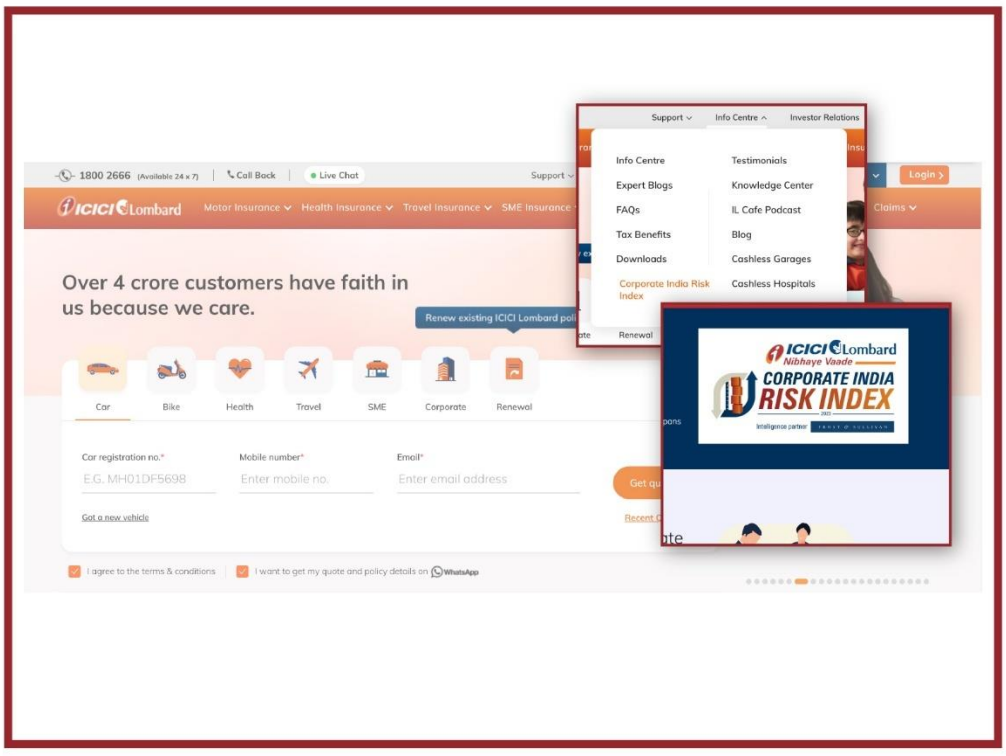

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