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# **INDIA - OMAN STRATEGIC COLLABORATION IN MINING & MINERALS**

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NOVEMBER 22, 2025

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Future-ready bilateral mining partnership and shared growth vision.

# **INDIA - OMAN STRATEGIC COLLABORATION IN MINING & MINERALS**

## **1. INTRODUCTION**

India and Oman share a long standing strategic partnership anchored in centuries old maritime ties, mutual trust, and steadily expanding economic engagement. As both nations shift towards resilient and future ready growth models, mining and minerals have emerged as a natural area of convergence with transformative potential. Oman is endowed with a diverse and commercially viable mineral base - chromite, gypsum, limestone, copper, dolomite, silica, gabbro, marble and possesses vast arid land suitable for industrial scale extraction, mineral beneficiation, and downstream manufacturing. Under Oman Vision 2040, the country is accelerating its transition away from hydrocarbons by building globally competitive mining clusters supported by advanced infrastructure in zones such as the Sohar Free Zone (metals and minerals value chains), Duqm SEZ (renewables, petrochemicals, heavy industries), and Khazain Economic City (logistics driven cluster development).

India, on the other hand, is one of the fastest growing global markets for metals, construction materials, and mineral based industries, supported by its robust manufacturing base under Make in India, strong demand from infrastructure and renewable energy sectors, and leadership in mining technology, geological surveying, mineral processing, and low - carbon metal production. India also has emerging strengths in green hydrogen, AI enabled mining automation, workforce upskilling, and circular economy practices that align with Oman's sustainability priorities.

Given these converging interests and complementary capabilities, India and Oman are strategically positioned to build an integrated, high value mining and minerals ecosystem that spans exploration, extraction, processing, metallurgy, logistics, renewable energy integration, and export oriented manufacturing. Collaborative ventures in this sector can not only enhance supply chain resilience for both countries but also position Oman as a regional minerals hub for Asia - Africa - Europe, while enabling India to secure stable access to critical minerals and expand its global footprint in metals and mining services.

## **2. TRADE STATISTICS & CURRENT MINING PROFILE**

### **2.1 Oman's Mining & Minerals Sector**

Oman's mining and minerals industry is emerging as one of the strongest pillars of diversification under Oman Vision 2040. The sector currently contributes **approximately 2 - 3% to the national GDP**, with a clear roadmap to scale up to **6% by 2030**, driven by expanded exploration, advanced processing, and investment friendly industrial zones.

Oman hosts a diverse portfolio of high - value minerals including:

- **Gypsum** (Oman is the world's largest exporter)
- **Chromite**
- **Limestone**
- **Gabbro & aggregates**
- **Dolomite**
- **Silica**
- **Copper**
- **Marble**

Omani mineral exports are directed largely toward **India, Bangladesh, the UAE, Qatar, Sri Lanka, and East African markets**, leveraging the country's strategic location at the crossroads of the Arabian Sea and the Indian Ocean. The **Sohar Port and Duqm Port** have rapidly evolved into major export gateways for bulk minerals, enabling Oman to service South Asia and Africa with competitive freight and reliable supply.

### **2.2 India's Mining Landscape**

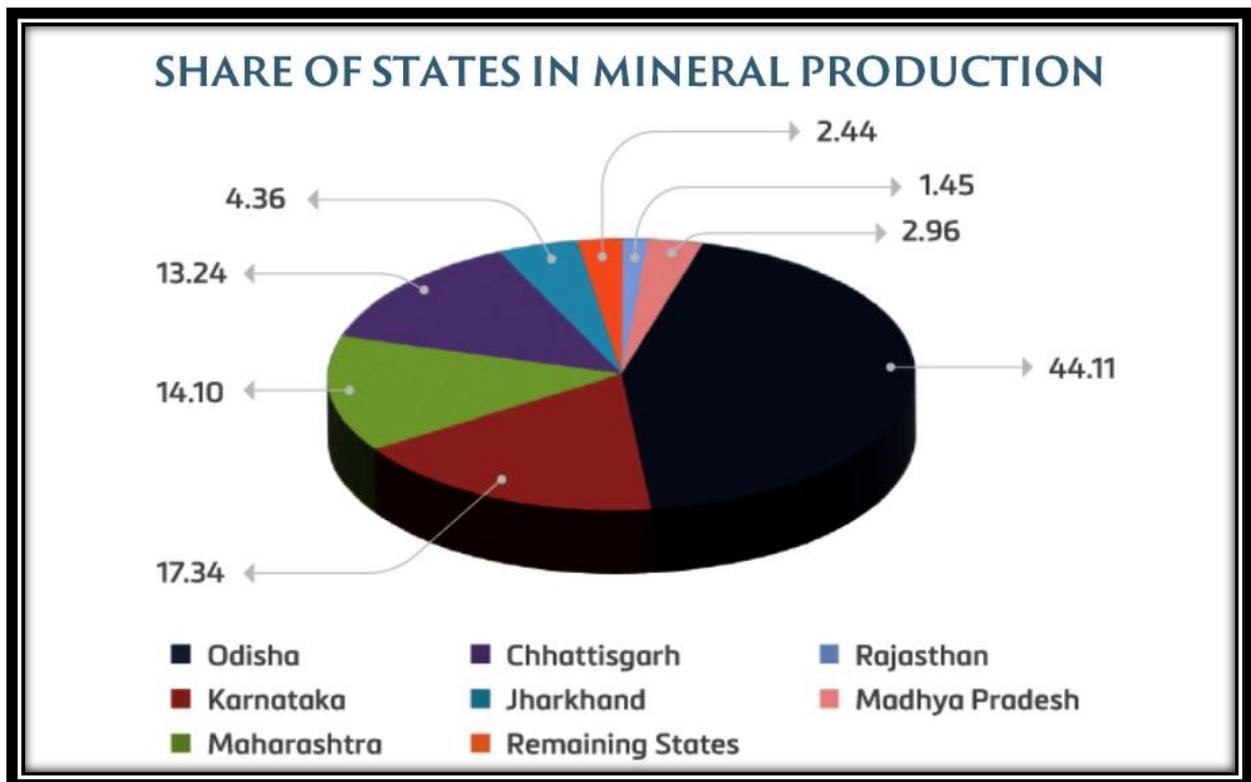
India is one of the world's fastest growing consumers of minerals, driven by massive national investments in infrastructure, steelmaking, cement, renewable energy installations, electric mobility, and electronics manufacturing.

India is among the top global consumers of:

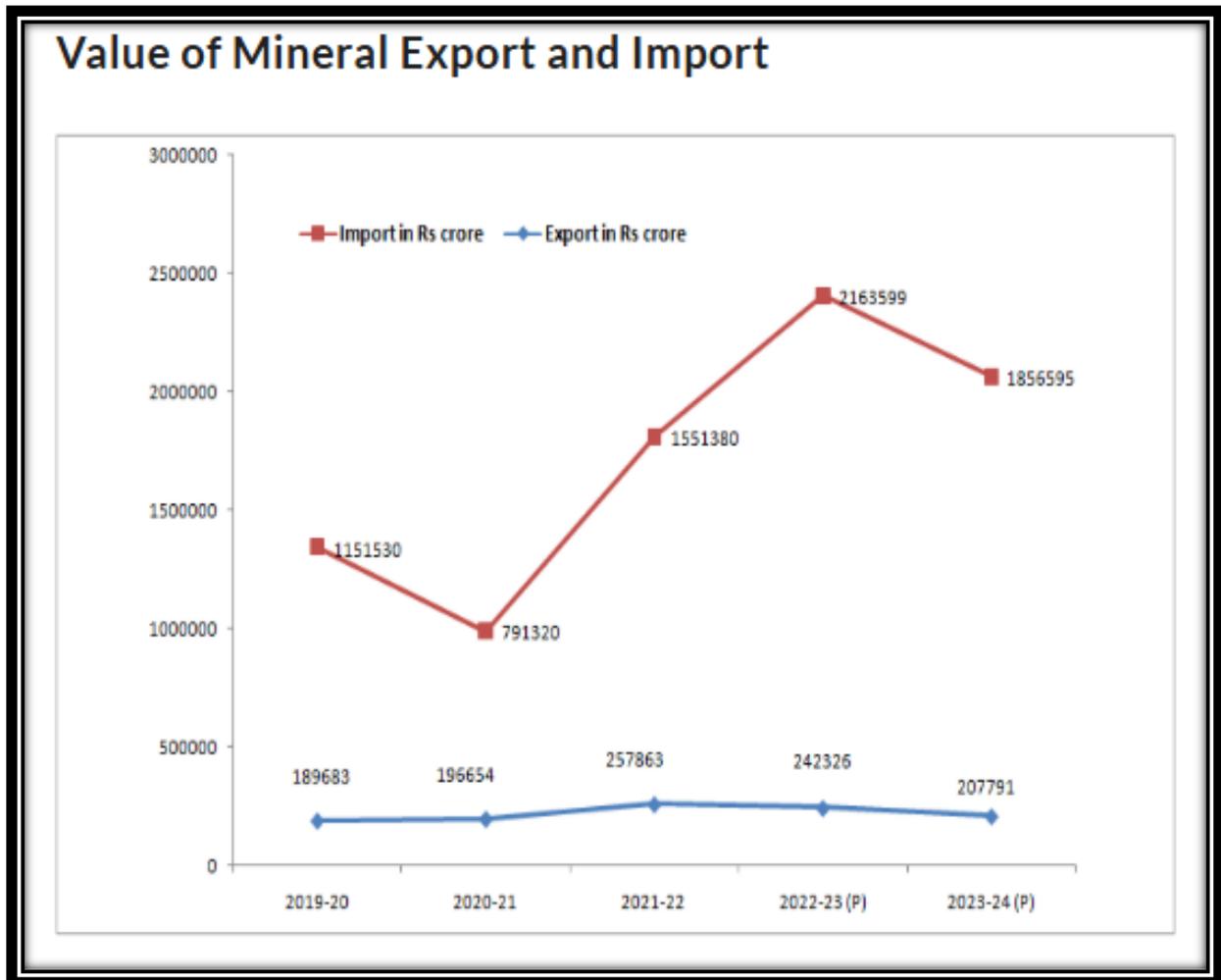
- **Iron ore**

- Copper
- Bauxite
- Limestone
- Gypsum
- Chromite

Despite possessing domestic resources, India faces **rising import dependency** due to accelerating demand from sectors such as construction, green energy, defence manufacturing, and the semiconductor & electronics ecosystem. Securing long term, stable, and high quality mineral supplies has become a key strategic priority within India’s industrial and energy security frameworks.



## INDIA'S EXPORT – IMPORT OF MINERALS



### 2.3 India - Oman Bilateral Mineral Trade

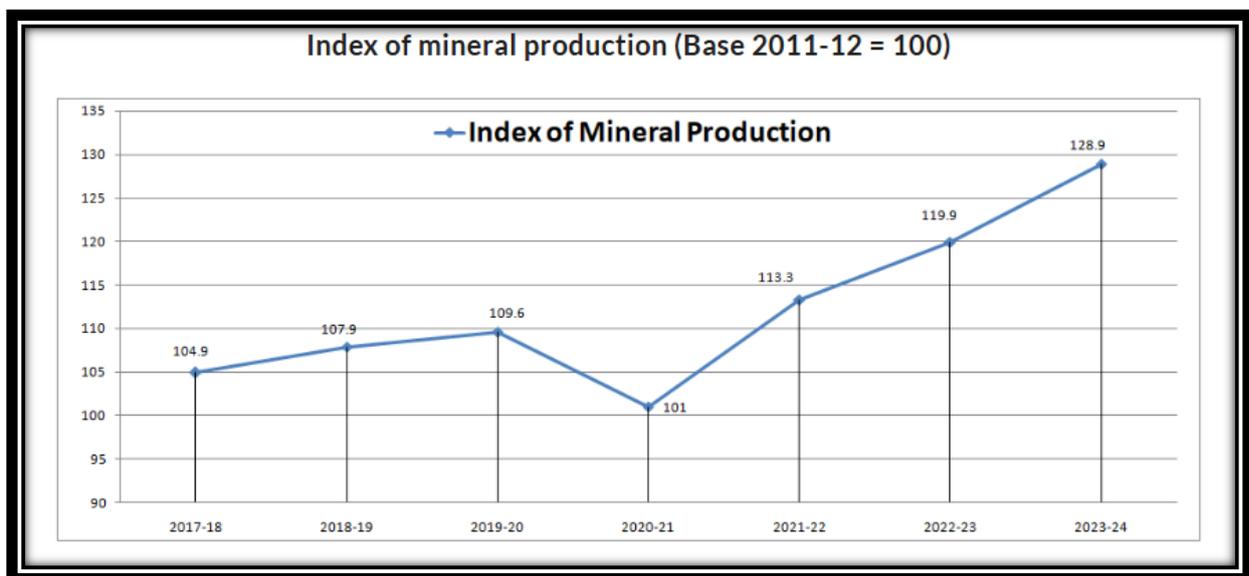
India and Oman maintain a strong and growing mineral trade relationship valued at **USD 1 - 1.4 billion annually**. India is one of Oman's largest and most stable buyers of:

- **Gypsum** (India imports **9 - 10 million tonnes per year**, with Oman as the dominant supplier)
- **Limestone & aggregates** (critical for Indian construction and cement industries)
- **Chromite ore** (used in ferrochrome and stainless - steel production)
- **Copper concentrate**

Beyond raw minerals, both countries see untapped potential in expanding trade and co - development in:

- **Downstream metals and alloys**
- **Mining equipment and technologies**
- **Green minerals and critical minerals**
- **Hydrogen powered mining operations**
- **Joint exploration and geological mapping projects**

This evolving trade profile positions Oman as a pivotal supplier for India's mineral security, while India serves as a long term anchor market for Omani exporters.



The provisional total value of mineral production (excluding atomic, fuel, and minor minerals) for 2023-24 is estimated to be ₹ 1,41,239 crore, representing a growth of approximately 14.83% over the previous year's figure of 2022-23.

#### **2.4 Strategic Synergies and Opportunities**

The India - Oman mining relationship is naturally aligned due to complementary strengths and strategic priorities:

- **India seeks** secure, long - term access to bulk minerals and specialty minerals to support its manufacturing, renewable energy, and infrastructure expansion.

- **Oman aims** to deepen downstream value addition, diversify its economy, attract foreign investors, and integrate into global value chains in metals and minerals.

Oman's industrial zones - **Sohar Free Zone, Duqm SEZ, and Khazain Economic City** operate on a **cluster based development model**, offering ideal platforms for:

- Integrated mining and processing parks
- Joint ventures in metallurgy
- Renewable powered mineral industries
- Export oriented manufacturing hubs

These synergies lay the foundation for building a **resilient, future ready, and high value bilateral mining ecosystem** that benefits both nations economically and strategically.

### **3. RECOMMENDATIONS**

#### **1. India - Oman Integrated Mineral Processing Zone (IMPZ) in Sohar**

##### **What it is:**

A bilateral, world class mineral processing and metallurgy zone focusing on steel, ferrochrome, copper, and aluminium production leveraging Oman's raw materials and India's technology and market leadership.

##### **How it works:**

- Oman allocates land within Sohar Free Zone + provides **low cost energy, tax waivers, and logistics incentives.**
- Indian PSUs (SAIL, NALCO, HCL) and private giants (Tata Steel, JSW, Hindalco) set up **processing and conversion units.**
- Manufacturing within the zone includes **billets, slabs, rolled coils, foils, alloys, rods, and metal components.**

##### **Why it matters / Impact:**

- Creates **15,000+ direct and indirect jobs** in Sohar.

- Enhances Oman’s industrial diversification under Vision 2040.
- Establishes Sohar as a **tri - regional export hub** for metals to India, GCC, East Africa, and Europe.
- Reduces India’s global import dependency for intermediate metals.

## **2. Long Term Mineral Supply Agreements for Strategic Minerals**

### **What it is:**

Structured 10 - 20 year bilateral supply contracts for gypsum, chromite, silica, limestone, dolomite, and construction aggregates.

### **How it works:**

- Government backed MoUs ensure **predictable prices, volume stability, and annual supply ceilings**.
- India and Oman jointly develop **shared bulk transport corridors** via Sohar, Duqm, Mundra, and Kandla ports.
- Integrated shipping arrangements reduce freight volatility.

### **Why it matters / Impact:**

- Shields India’s construction and steel industries from global price shocks.
- Secures Oman a **stable, long term revenue base**.
- Supports India’s mega infrastructure projects (NIP, Bharatmala, Smart Cities).
- Strengthens Oman’s position as India’s primary mineral partner.

## **3. Indo - Oman Green Hydrogen Based Mining & Refining Pilot (Duqm)**

### **What it is:**

A pilot facility to produce **green iron (HBI/DRI)** and hydrogen powered copper refining using Duqm’s abundant solar resources.

### **How it works:**

- India contributes **green hydrogen electrolyser technology and process engineering.**
- Oman provides **land, solar farms, and financing through hydrogen clusters.**
- Output includes **green steel intermediates and low carbon copper.**

**Why it matters / Impact:**

- Places Oman among the **world’s earliest adopters of green metals.**
- Positions India to meet its green steel and EV battery sector demand.
- Enables carbon neutral mining for export markets.
- Attracts global ESG investors and green financing.

**4. Joint Geological Survey & Digital Exploration Mission**

**What it is:**

A collaborative mapping initiative using drone based surveying, AI analytics, and remote sensing to identify untapped Omani deposits.

**How it works:**

- Indian agencies (GSI, MECL) and tech firms lead **geophysical surveys.**
- Deployment of **LIDAR drones, hyperspectral imaging, satellite mapping,** and AI prediction models.
- Focus on **copper, gold, rare earths, silica, and new chromite belts.**

**Why it matters / Impact:**

- Leads to new mineral discoveries and high value concessions.
- Reduces Oman’s exploration cost while boosting productivity.
- Creates a pipeline of joint ventures for multi decade development.
- Enhances geological data transparency for global investors.

## **5. India - Oman Aggregates & Construction Minerals Corridor**

### **What it is:**

A dedicated shipping and logistics corridor connecting Omani quarries to Indian coastal megaprojects.

### **How it works:**

- Long term bulk shipping contracts between Omani miners and Indian infra firms.
- Establish **stockpiling terminals** at Mumbai, Kandla, Kochi, and Vizag.
- Automated conveyor and bulk handling systems at Sohar & Duqm.

### **Why it matters / Impact:**

- Reduces construction material costs for Indian ports, highways, metros.
- Increases Omani exports by **20 - 30% over 5 years**.
- Ensures uninterrupted supply during peak project cycles.
- Supports India's USD 1.4 trillion NIP programme.

## **6. Indo - Oman Copper & Aluminium Manufacturing JV**

### **What it is:**

A joint downstream manufacturing venture producing cables, rods, rolled sheets, automotive components, and packaging grade foils.

### **How it works:**

- Oman supplies **raw copper & alumina** + low energy prices.
- India contributes **processing expertise and global demand channels**.
- Dual-location model: primary production in Sohar + finishing units in India.

### **Why it matters / Impact:**

- Expands Oman's non - oil exports and mid - stream industrial capacity.

- Reduces India's reliance on China for aluminium & copper intermediates.
- Creates a competitive manufacturing chain from raw ore to final product.
- Enhances GCC - India supply chain resilience.

## **7. Mining Equipment, Drones & Technology Transfer Hub (Muscat)**

### **What it is:**

A regional centre for mining machinery, automated drilling tools, safety equipment, and drone - servicing/assembly units.

### **How it works:**

- Set up by Indian innovators (BEL, BEML, L&T, drone startups).
- Includes **R&D labs, training workshops, and maintenance centres.**
- Supplies equipment to Oman, GCC, East Africa, and West Asia.

### **Why it matters / Impact:**

- Elevates mining safety and automation standards in Oman.
- Creates export opportunities for Indian manufacturing firms.
- Strengthens Oman's ambition to become a technology-driven mining economy.
- Reduces equipment import dependency for GCC countries.

## **8. India - Oman Mineral Trading & Re - Export Platform (Duqm)**

### **What it is:**

A global scale minerals marketplace and warehousing ecosystem for re - exporting Indian, Omani, African, and Central Asian minerals.

### **How it works:**

- Build **silos, mineral grading labs, a certification centre, and digital trading platform.**
- Partnerships with African mining clusters in Tanzania, Kenya, DRC, Mozambique.
- Use Duqm's strategic location for transshipment to Europe/Asia.

**Why it matters / Impact:**

- Makes Oman a **global mineral trading hub**, comparable to Rotterdam or Singapore.
- Deepens Oman's integration into global commodity value chains.
- Enhances India's access to African minerals via a trusted partner.
- Creates a new revenue stream from re - exports and logistics.

**9. Joint Skill Academy for Mining Engineering, Automation & Safety**

**What it is:**

A high end skill development institution specialising in geology, mining engineering, mineral processing, AI in mining, and ESG compliance.

**How it works:**

- Collaboration between **IIT(ISM) Dhanbad, NIT Surathkal, Omani universities**, and industry partners.
- Courses in **autonomous mining vehicles, drone operations, mine safety, AI - based mine planning.**
- Certifications aligned with GCC professional standards.

**Why it matters / Impact:**

- Creates a **future - ready mining workforce** for Oman.
- Reduces reliance on expatriate labour in critical roles.
- Supports India's education export strategy.
- Enhances safety and sustainability across mines.

## **10. Environmental Restoration & Sustainable Mining Partnership**

### **What it is:**

A collaborative programme focusing on mine rehabilitation, desert ecosystem restoration, biodiversity monitoring, and sustainable water use.

### **How it works:**

- Indian environmental institutes design **restoration models** for Oman's mining zones.
- Introduce **bio - remediation, afforestation belts, and water recycling systems**.
- Joint ESG audits for mines to meet EU/Global sustainability norms.

### **Why it matters / Impact:**

- Enhances Oman's global ESG rating and environmental compliance.
- Attracts climate funding, green bonds, and sustainable investors.
- Ensures long term ecological balance in mining intensive regions.
- Supports Vision 2040's sustainability and green mining targets.

## **11. India - Oman Critical Minerals Exploration & Processing Alliance**

### **What it is:**

A dedicated bilateral task force to identify, extract, process, and secure supply of critical minerals - such as silica, rare earth elements (REEs), nickel, cobalt, and battery minerals essential for EVs, electronics, and renewable energy.

### **How it works:**

- Joint exploration missions in Oman's interior regions using India's rare - earth mapping expertise.
- Co - investment in small - scale beneficiation plants for REE concentrates.

- Integration with India's Critical Minerals Mission and Oman's Vision 2040 industrialisation plans.

**Impact:**

- Strengthens India's supply chain for semiconductors, EVs, and solar technology.
- Establishes Oman as a new regional player in critical minerals.
- Reduces dependence on China dominated mineral markets.

**12. Indo - Oman Desert Mining Technology Testbed (Duqm Basin)**

**What it is:**

A dedicated facility for testing mining technologies designed for desert conditions heat - resistant drones, robotic mining tools, autonomous haulage, and dust resistant equipment.

**How it works:**

- Co - run by DRDO, ISRO spin - offs, and Oman's Ministry of Energy & Minerals.
- Test advanced **robotic drills, AI mine planners, desert grade sensors, autonomous vehicles.**
- Export technologies to GCC and African desert - mining regions.

**Impact:**

- Makes Oman a **regional innovation lab** for desert mining solutions.
- Strengthens India's global presence in deep - tech mining tools.
- Attracts global tech firms to trial their solutions in Oman's unique terrain.

**13. India - Oman Mineral Value Chain Financing Facility**

**What it is:**

A bilateral financing platform to support joint ventures, exploration, processing units, and offtake contracts.

**How it works:**

- Backed by State Bank of India, Bank Muscat, and Oman Investment Authority.
- Offers **low - interest loans, credit guarantees, and trade finance** for mineral JVs.
- Financing priorities: green metals, logistics, downstream manufacturing.

**Impact:**

- Speeds up project execution for SMEs and mid - size mineral firms.
- Makes large - scale mineral projects bankable and investor ready.
- Attracts global private capital to Oman's mining sector.

**14. Indo - Oman Maritime Minerals Transport Grid****What it is:**

A digital + physical logistics grid integrating shipping lines, ports, mineral terminals, and digital tracking to streamline India - Oman mineral flow.

**How it works:**

- Smart port integration between Sohar, Duqm, Mundra, Kandla, Krishnapatnam.
- Blockchain enabled tracking of cargo, quality certifications, and real - time pricing.
- Shared berths, bulk carriers, and priority docking for bilateral mineral shipments.

**Impact:**

- Cuts logistics costs by 12 - 18%.
- Improves delivery timelines for Indian infra projects.
- Strengthens Oman's status as a minerals shipping hub.

**15. Oman - India Institute for Low - Carbon Metal Technologies****What it is:**

A joint R&D centre focused on **green steel, green aluminium, carbon capture in mining, renewable powered smelters**, and waste to mineral conversion.

**How it works:**

- Collaboration between IIT Madras, Sohar University, and Oman Hydrogen Centre.
- Pilot projects on carbon neutral smelting and green mining chemicals.
- Joint patents for green metallurgy technologies.

**Impact:**

- Helps Oman become the region's **leader in low carbon metal production**.
- Enhances India's technological leadership in green smelting.
- Attracts climate - tech investments and accelerates ESG compliance.

## **16. Indo - Oman Digital Mineral Exchange (D - MEX)**

**What it is:**

A real - time **commodity trading platform** enabling buyers and sellers to trade Omani, Indian, and African minerals online.

**How it works:**

- AI - driven pricing engine for gypsum, chromite, copper, aggregates.
- Blockchain for traceability, quality assurances, and dispute resolution.
- Hosted in Duqm; linked to India's electronic National Agriculture Market (eNAM) model.

**Impact:**

- Creates transparent, predictable mineral markets.
- Boosts Oman's re - export revenue through digital listings.
- Enhances India's procurement efficiency for minerals.

## **17. Joint India - Oman Desert Water Management for Mining**

### **What it is:**

A specialised partnership for **water recycling, desalination integration, wastewater reuse,** and low - water mineral processing.

### **How it works:**

- Install Indian - designed zero liquid discharge systems in Omani quarries.
- Use solar - powered desalination for processing.
- Deploy IoT systems to monitor water efficiency.

### **Impact:**

- Reduces water stress in mining heavy regions of Oman.
- Establishes Oman as a benchmark for **sustainable desert mining.**
- Enhances India's technology export in water management.

## **18. India - Oman Maritime Security Framework for Mineral Shipping**

### **What it is:**

A cooperative security mechanism to protect mineral shipments in the Arabian Sea, Gulf of Oman, and Red Sea routes.

### **How it works:**

- Joint naval monitoring of shipping lanes.
- Shared anti - piracy protocols and real - time vessel tracking.
- Security agreements for ships carrying critical minerals.

### **Impact:**

- Ensures uninterrupted mineral flow to Indian industries.
- Strengthens Oman's maritime security posture.
- Enhances India's strategic presence in the region.

## **19. Mining Start Up Exchange Platform (Muscat - Bengaluru Innovation Track)**

### **What it is:**

A bilateral innovation platform connecting Indian mining tech startups with Omani mining companies.

### **How it works:**

- Annual accelerator program hosted between Bengaluru and Muscat.
- Funds provided by Oman Technology Fund & India's DST.
- Startups offer solutions in: predictive maintenance, mining drones, 3D mapping, safety wearables.

### **Impact:**

- Creates a cross border innovation ecosystem.
- Provides Oman with access to top-tier Indian mining tech solutions.
- Opens GCC markets for Indian tech startups.

## **20. Indo - Oman Industrial Minerals Park for Ceramics, Glass & Cement**

### **What it is:**

A downstream industrial cluster for manufacturing **glass, ceramic tiles, sanitaryware, insulation materials, and cement products** using Omani silica, limestone, and gypsum.

### **How it works:**

- Located near Sohar or Duqm with ready access to mineral quarries.

- Indian firms (Kajaria, Saint - Gobain India, UltraTech, HSIL) set up manufacturing units.
- Export finished products to GCC, East Africa, and Europe.

**Impact:**

- Drives high value manufacturing in Oman.
- Reduces India’s imports of silica based products.
- Establishes Oman as a regional ceramics & glass manufacturing hub.

**5. PROJECTED BENEFITS**

**Projected Benefits for Oman**

For Oman, the partnership with India in mining and minerals catalyses a major shift toward a diversified, high value, and export oriented industrial economy. It strengthens non - oil GDP growth, attracts sustained FDI inflows, and creates quality jobs for Omani youth across mining operations, mineral processing, logistics, engineering services, and R&D. By enabling significant value addition within the country especially in metals, aggregates, and downstream mineral products Oman enhances its industrial competitiveness and accelerates its Vision 2040 goals in manufacturing and economic transformation. The collaboration also positions Oman as a regional re - export hub for minerals and metals servicing Asia, Africa, and Europe, supported by Sohar and Duqm’s world class logistics. Importantly, the integration of green hydrogen and low carbon mining technologies elevates Oman’s profile as a future ready, sustainable mining leader in the Gulf.

**Projected Benefits for India**

For India, deeper collaboration with Oman provides long - term mineral security critical for its rapidly expanding steel, cement, construction, renewable energy, defence, and EV manufacturing sectors. Stable, long horizon supply agreements for gypsum, chromite, limestone, and aggregates reduce import volatility and lower raw material costs for India’s infrastructure boom. The partnership enhances India’s access to Oman’s strategic ports, strengthening its connectivity with African mineral markets and global supply chains. Joint

ventures in mineral processing and downstream manufacturing broaden the global footprint of Indian companies while creating new export markets for Indian technologies in mining equipment, drones, automation, and AI - driven surveying. Collaboration on renewable energy and green hydrogen further supports India's clean energy transition. Overall, the partnership enhances India's strategic influence in the Gulf and enables PSUs and private players to scale through secure, mutually beneficial joint ventures

## **6. CONCLUSION**

India and Oman stand at a pivotal moment to forge a transformative, future - oriented partnership in mining and minerals, one that strategically aligns Oman's rich resource base, world - class logistics, and industrial zones with India's technological prowess, manufacturing depth, and expanding mineral demand. Through a coordinated, cluster based model of cooperation anchored in Sohar, Duqm, and Khazain, both nations can co - develop integrated mineral ecosystems, advance green metallurgy, and build high - efficiency supply chains that serve regional and global markets. This collaboration not only enhances economic resilience and industrial diversification but also positions the India - Oman axis as a central hub for sustainable mining, processing, and re - export across the Gulf, Africa, and Asia. By combining long-term vision with actionable bilateral initiatives, India and Oman have the opportunity to unlock new value chains, attract global investment, and shape a shared trajectory of prosperity rooted in minerals, innovation, and sustainable development.