

SAFE, SMART & SUSTAINABLE MINING

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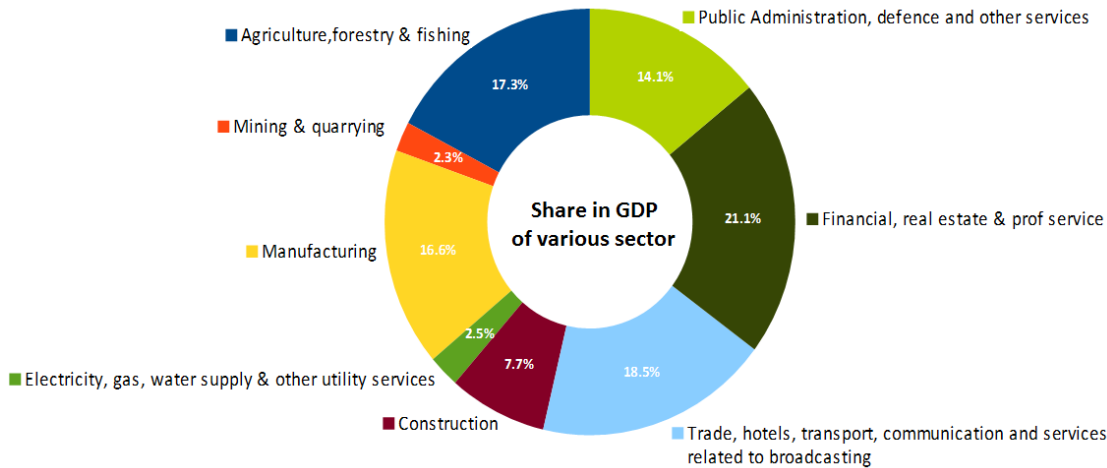
MINING – RELEVANCE TO CIVILIZATION

Mining may well have been the second of humankind's earliest endeavors - granted that Agriculture was the first.



MINING IN INDIAN CONTEXT – GDP & EMPLOYMENT

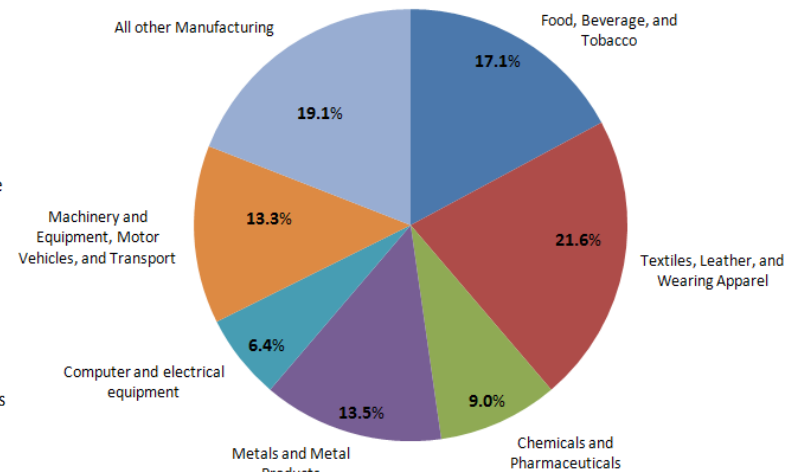
GDP



The GDP contribution of the Mining Sector varies from **2.2% to 2.5%**.

EMPLOYMENT

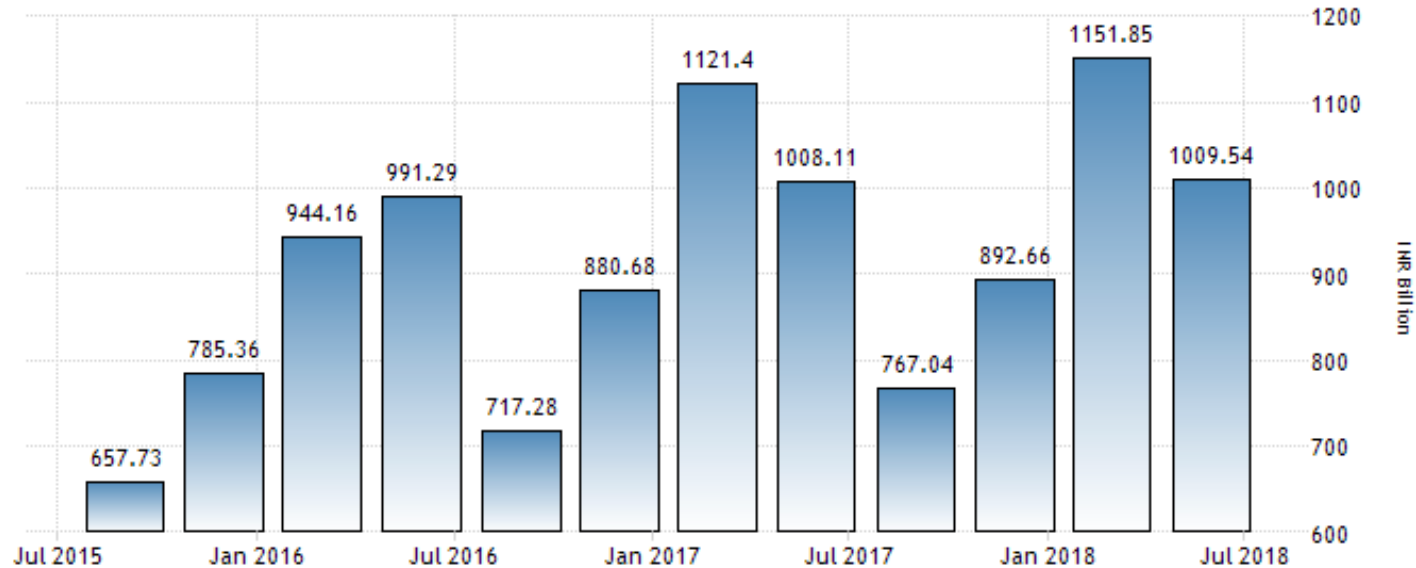
Industry employment as a percent of employment in India's organized manufacturing sector, 2010



Source: U.S. Bureau of Labor Statistics, International Labor Comparisons

About 600 coal mines, 35 oil projects and 6,000 metalliferous mines of different sizes employ over **one million** persons on a daily average basis.

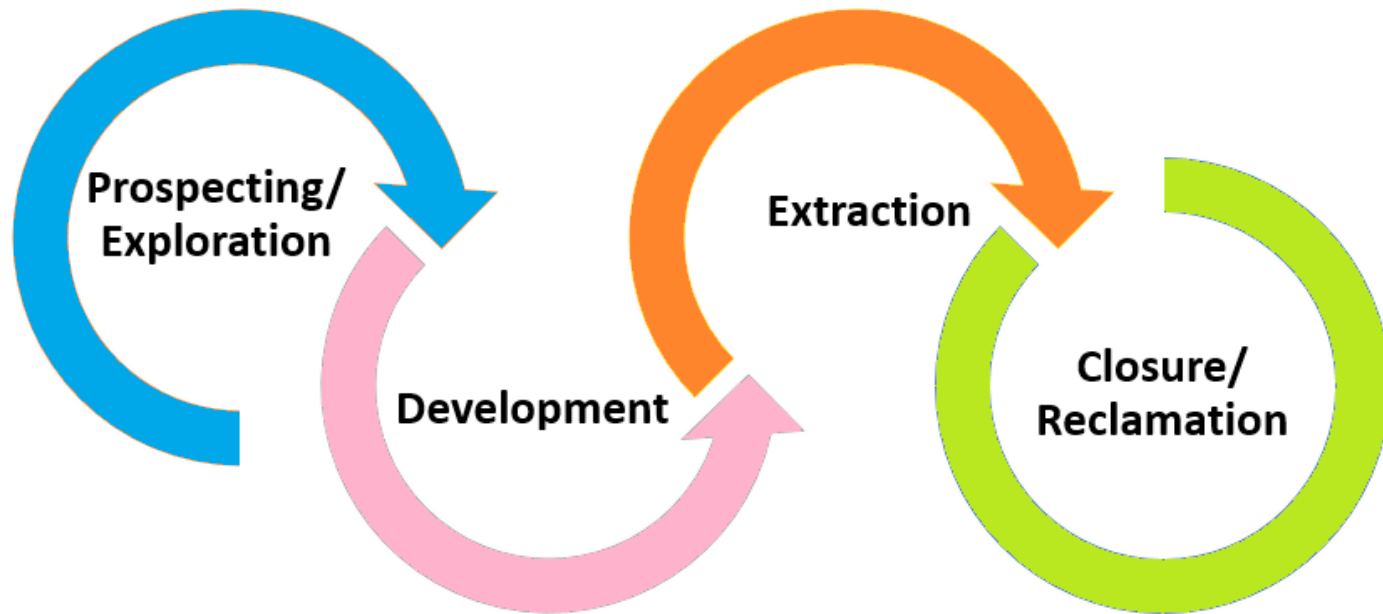
MINING IN INDIAN CONTEXT – TOTAL VALUE



“The country has produced minerals worth **Rs 1.13 Lakh Crore in FY18**, registering an increase of 13 per cent over the previous fiscal.”

– Annual Report 2017-18 of Ministry of Mines.

LIFE CYCLE OF A MINE



Every cycle in life of a mine has to be **Smart, Safe & Sustainable**.

SMART MINING

Mining, which started as an art, transformed over years to emerge as a major scientific revolution. **Technologies** from various sectors are being applied into mining, resulting in further strengthening of the sector.

Reducing gap: Actual vs Virtual

Reducing Human Error using Algorithm

Data helping Decision

Its always **Environment** first, so that we can last

Saving Energy & Water

SMART MINING

- **Reducing gap: Actual vs Virtual**

- Digitally enabled workforce and equipments.
- Integrated Enterprise & Platforms.



- **Reducing Human Error using Algorithm**

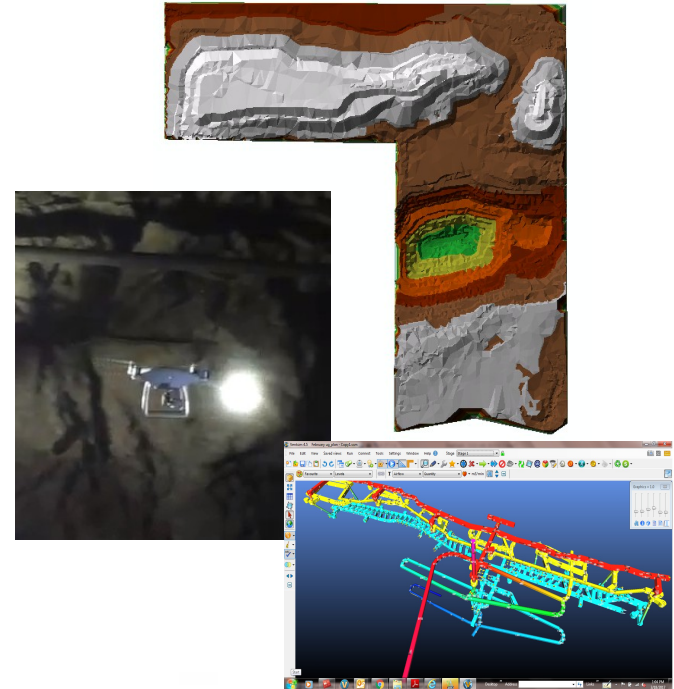
- Automation of operations.
- Artificial Intelligence.



SMART MINING

- **Data helping Decision**

- Aerial Monitoring & surveillance helping in operation, security & rehabilitation.
- GIS and 3-D model based mine planning is becoming more efficient in decision making.
- Real Time Monitoring helps in tracking deviations and prevent its consequences.



- **Saving Energy & Water**

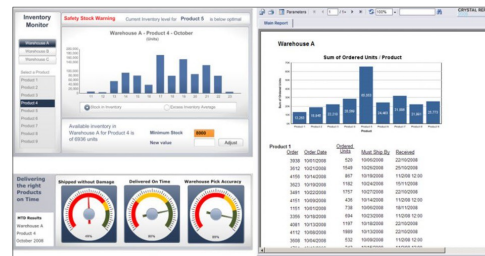
- Becoming energy efficient & move towards renewable.
- Giving back more clean water to nature than we extract.



SAFE MINING

Thinking beyond Conventional

1. Taking safety from **Board to Bottom**
2. Bringing **Innovations** to workplace
3. Assessing hazards and controlling the risks in a **Realtime**
4. More focus on **Behavioural Safety**



SAFE MINING – GUIDING BODIES

1. Safety Legislation in Mines

- (a) The Mines Act, 1952
- (b) The Metalliferous Mines Regulations, 1961
- (c) The Coal Mines Regulations, 2017

2. National Safety Conference

A tripartite forum at national level whose objective is to dwell upon the emerging safety and health issues in mines by different stake holders of the country to identify the thrust areas for improvement in the safety standards in Indian mines.

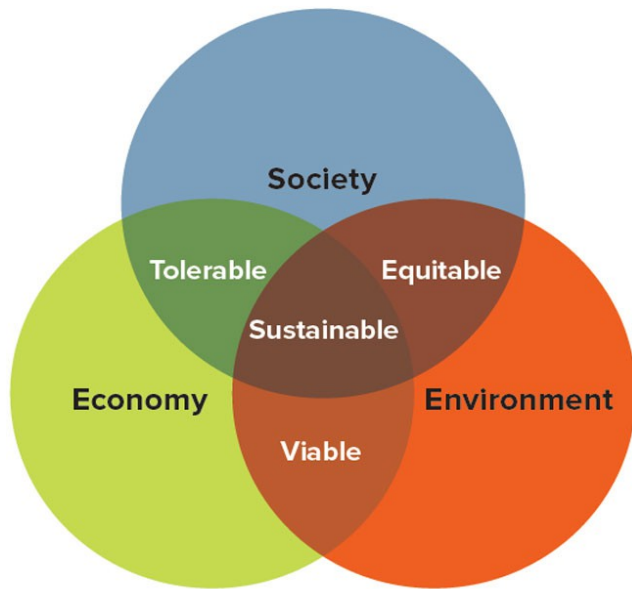
3. International Labour Organisation

The only tripartite U.N. agency, since 1919 that brings together governments, employers and workers of 187 member States, to set labour standards, develop policies and devise programmes promoting decent work for all women and men.

4. Directorate General of Mines Safety

It is the apex Regulatory Agency in India that deals with occupational safety, health and welfare of persons employed in mines (Coal, Metalliferous and oil-mines).

SUSTAINABILITY IN MINING



**SUSTAINABILITY:
THE CORE OF BUSINESS MODEL**

DEFINING SUSTAINABLE MINING

(as per Sustainable Development Framework, MoM, Govt of India)

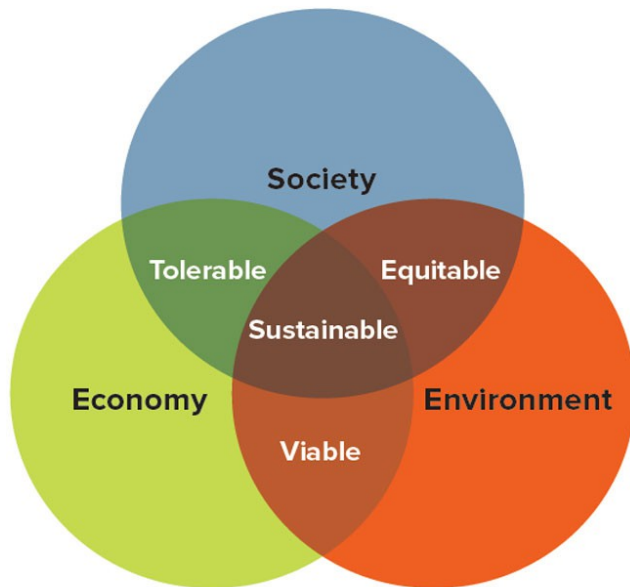
Sustainable Mining is:

- Financially viable
- Socially responsible
- Environmentally, technically and scientifically sound
- Long term view of development
- Uses mineral resources optimally
- Ensures sustainable post-closure land uses.

Partnerships between:

- Government
- Community &
- Miners

SUSTAINABILITY – GUIDING PRINCIPLES



SUSTAINABILITY: THE CORE OF BUSINESS MODEL

National Mineral Policy, 2008

Miner shall leave the mining area in better ecological shape than he found it.

National Mineral Exploration Policy, 2016

- Establishes priorities, mineral commodities, areas and mining technology.
- Defines role of key players.
- Outline changes in regulatory framework.
- Harnesses resources keeping in mind human capital.

Sustainable Development Framework

Star Rating System

Enables Star performers for a green channel against regulatory hurdles.

We at INDIAN METALS & FERRO ALLOYS LIMITED



Established in 1961 In the Eastern State of Odisha, IMFA is India's largest, fully integrated producer of ferro alloys with 187 MVA installed furnace capacity backed up by 258 MW captive power generation and extensive chrome ore mining tracts.

IMFA is unique from the quality perspective due to comprehensive ISO 9001 Quality Management certification besides ISO 14001 Environment Management and ISO 18001 Occupational Health & Safety certification.



ABOUT IMFA

The manufacturing cycle comprising of chrome ore mining, power generation and ferro alloys smelting.

Ferro Alloys

Six furnaces adding up to 187 MVA have been set up at Therubali (Rayagada District) and Choudwar (Cuttack District) in Odisha thus making IMFA the largest producer of ferro chrome in India.

Mining

A mix of open cast and underground mining operations in Odisha's Jajpur and Keonjhar Districts cater to IMFA's requirement of chrome ore. It is the first to initiate underground mining in Sukinda Valley.

Power

Captive power generation capacity stands at 258 MW comprising of a 108 MW coal-based unit, a 30 MW dual-fuel unit and a 120 MW coal-based unit.



MINING IN SUKINDA VALLEY BY M/S IMFA LTD.

IMFA operates two Chromite Mines in Sukinda valley.

A. Sukinda Mines (Chromite)



B. Mahagiri Mines (Chromite)



MINING IN SUKINDA VALLEY BY M/S IMFA LTD.

Sukinda Mines (Chromite) is a mechanised Opencast Mine using HEMMs along with deep hole drilling & blasting.



MINING IN SUKINDA VALLEY BY M/S IMFA LTD.

Mahagiri Mines (Chromite) is being operated both by Opencast & Underground Mining.

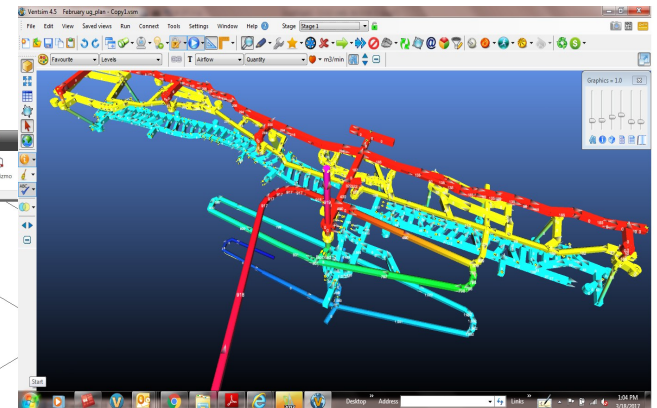
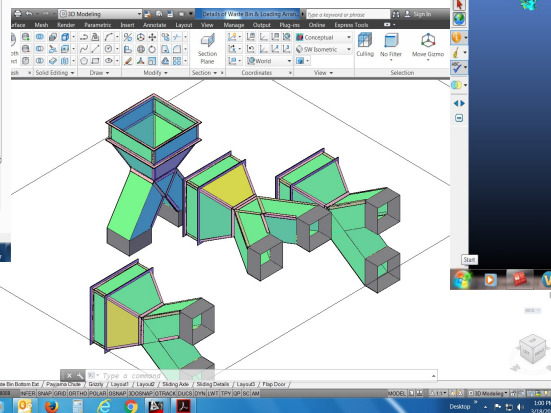
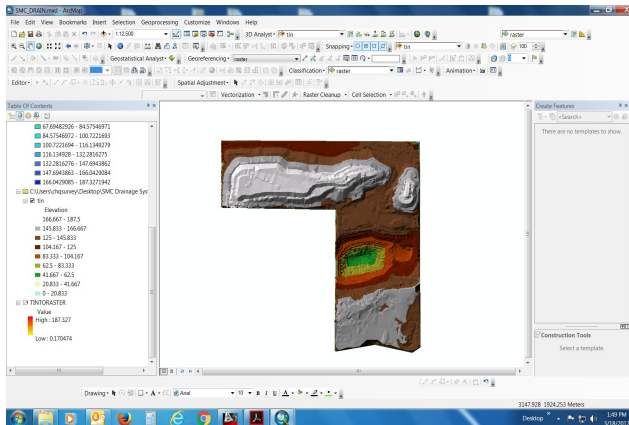
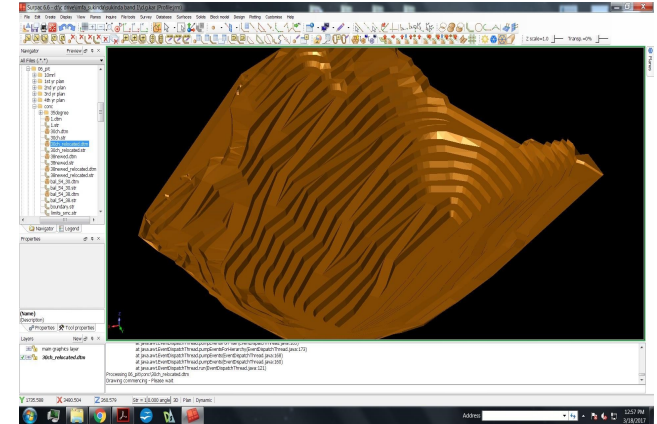


SMART MINING AT IMFA

Mine Planning & Other Tools:

SURPAC
VENTSIM
ArcGIS

Real time monitoring of underground strata condition.
Trial Completed. Next move is towards full fledge implementation



SAFE MINING AT IMFA - AWARDS

1. Sukinda Mines (Chromite) received the prestigious award **“Rio Tinto Health & Safety Award”** from Federation of Indian Mineral Industries (FIMI) -2016-17.
2. Mahagiri Mines Rescue Team got first prize in **“March-Past and theory in the Zonal Rescue Competition”** held at MCL.
3. Nuasahi Chromite Mines Bags **“National Safety Award-2014”**.
4. Prizes in Safety week celebration

Sukinda Mines (Chromite):	Mahagiri Mines (Chromite):
Gen. Working -1st	Overall:1st
Training health & welfare -1st	Gen. Working -1st
Safety compliance - 1st	Training health & welfare -1st
Maintenance - 1st	Maintenance - 1st
Overall- 3rd	



SCIENTIFIC & ENVIRONMENT FRIENDLY MINING

Optimum Planning of Opencast Quarry.

Underground & Other Innovative mining methods.

Overburden Dump Management.

Environment Management Plan.

Surface Runoff Management.

Plantation on massive scale.



SUSTAINABILITY AT IMFA MINES



2017-18



2016-17

Sukinda Mines (Chromite) & Mahagiri Mines (Chromite)

2017-18: 5-Star (self-assessment) as per sustainability development framework as per IBM

2016-17: **4-Star** given by IBM

TOWARDS SOCIETY

VISION

IMFA's vision for corporate responsibility is reflected in the motto ***Touching lives beyond business*** wherein we approach inclusive growth by implementing multi-sectoral, sustainable projects which will enable marginalised communities to live a healthy, dignified and meaningful life.

FOCUS AREAS

Health Initiatives
Water and Sanitation
Education
Livelihood
Emergency Response
Advocacy and Appreciation



**CSR Leadership Award by
ABP News, 4th Feb' 2017**

**WINNER of “Best Corporate
Social Responsibility Practices”**



THANK YOU