

SUSTAINABILITY SUMMIT: ASIA-2006, NEW DELHI

'PROMOTING EXCELLENCE FOR SUSTAINABLE DEVELOPMENT'

19-20 DECEMBER 2006

SUSTAINABLE IRON ORE MINING – A CONTINUOUS JOURNEY



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SUSTAINABLE IRON ORE MINING – A CONTINUOUS JOURNEY



“Sustainable” Implies:

- * Something which can be continued

Mining :

- * Natural resource
- * Finite resource – How finite!

Does sustainability and finite operations go together?



Sustainable Mining :

- * Sustainability of the Mining operations until the finite resources are exhausted.



Ingredients of sustainability of Iron ore mining (open cast) – Sesa's View:

- * Optimum use of resources in a scientific / systematic manner (Open cast)
- * Environment management
- * Social development



Scientific / systematic mining :

- Prospecting / exploration of the area to understand the Geology of the mine.
- Based on exploration data arrive at the most economical scale so as to extract maximum resources.
- Stressing on land reclamation aspect while developing the mine.

Contd..



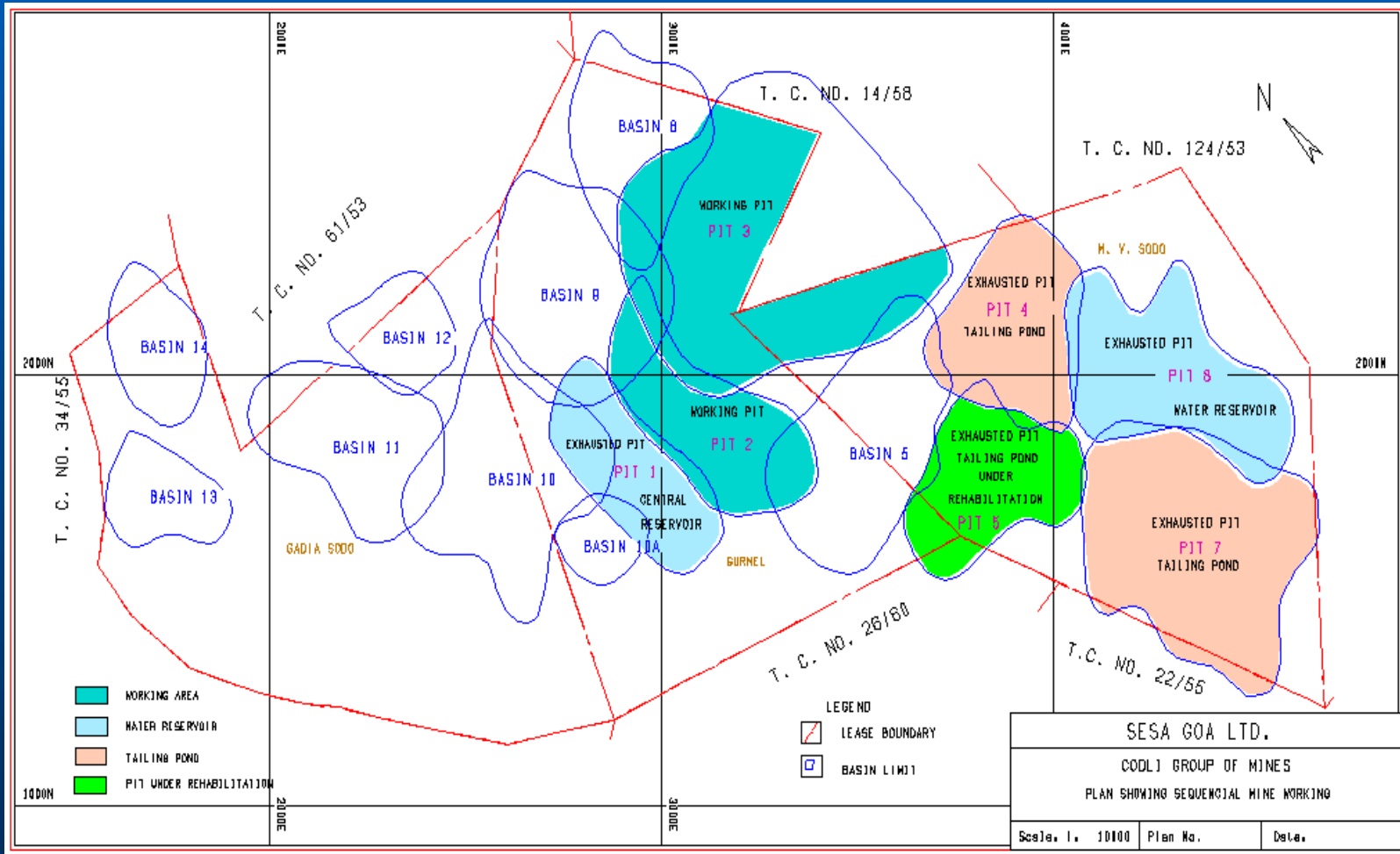
Scientific / systematic mining :

- Using latest software to develop the mining Plan keeping in mind the factors such as:
 - Dumping area available
 - Proximity to human settlement
 - Optimum use of forest land , if any
 - Necessity of land reclamation
 - Water harvesting for beneficiation
 - And pollution control
- In Indian conditions sequential mining is the best approach in most of the cases.

SUSTAINABLE IRON ORE MINING – A CONTINUOUS JOURNEY



Sesa Practices: Sequential mine working



SUSTAINABLE IRON ORE MINING – A CONTINUOUS JOURNEY



Air :

- ❑ Use fuel efficient machineries and no compromise on scheduled maintenance.
- ❑ Use rippers instead of blasting to the maximum (controls noise pollution also).
- ❑ Maintain appropriate roads inside the mines.
- ❑ Use dust suppression systems in all open transfer points of material.
- ❑ Use wheel wash system for vehicles.
- ❑ Use tarpaulin to cover the vehicles carrying material.
- ❑ Use Geo-textiles followed by plantation to cover the mining dumps.

SUSTAINABLE IRON ORE MINING – A CONTINUOUS JOURNEY



Sesa Practices - Mitigation measures for air pollution

- Fixed & Mobile water spraying on the haulage Roads
- Asphalting of the road Junction meeting public roads
- Covering of the trucks carrying ore with Tarpaulin.
- Wheel Wash System
- 9" free board for all the trucks
- Green Belt around mining area as physical barrier

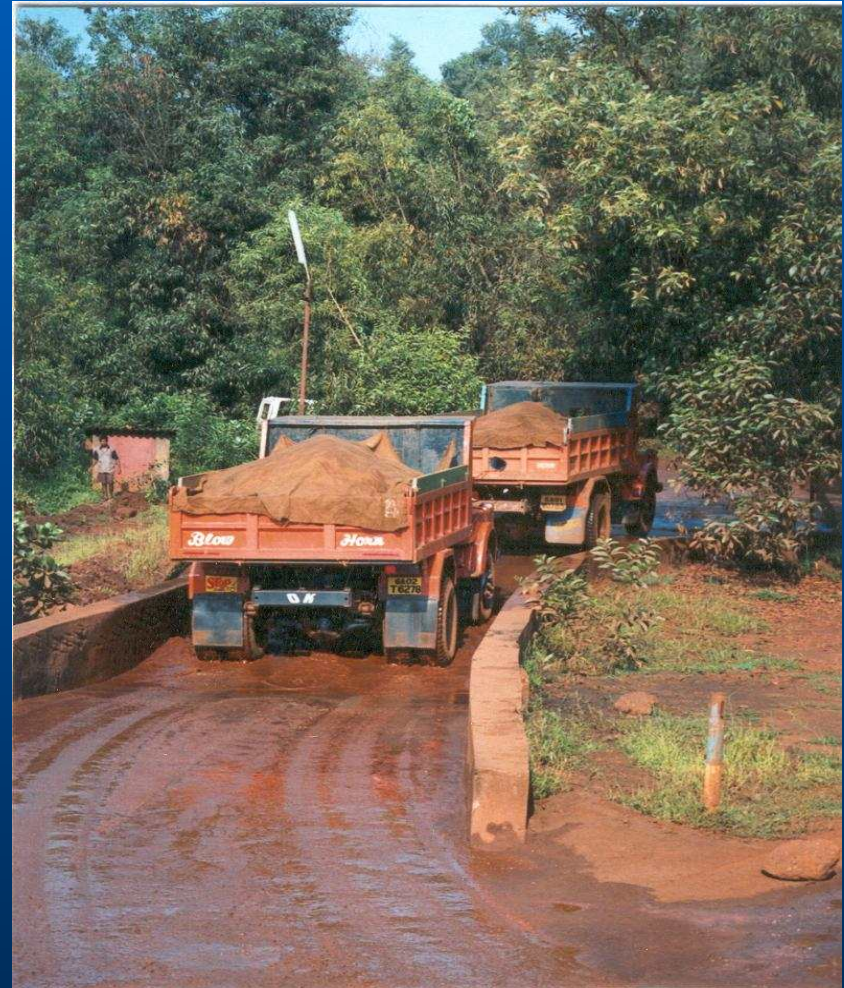
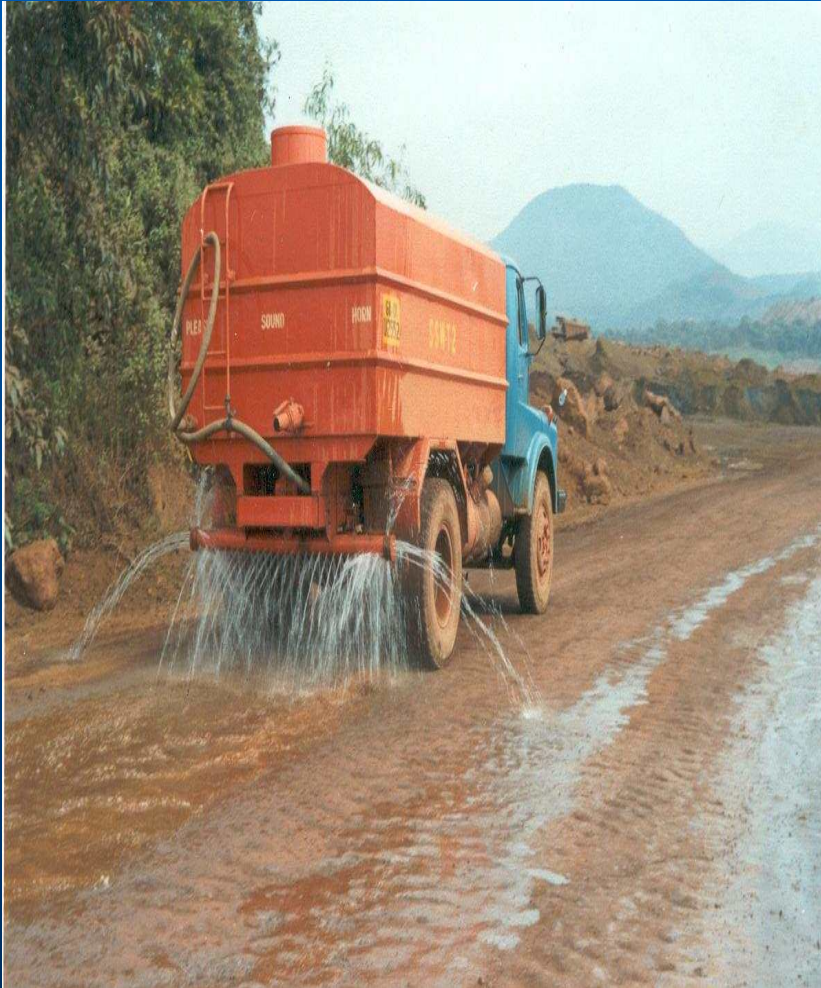


Fixed dust suppression
on mine roads

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Sesa Practices - Mitigation measures for air pollution



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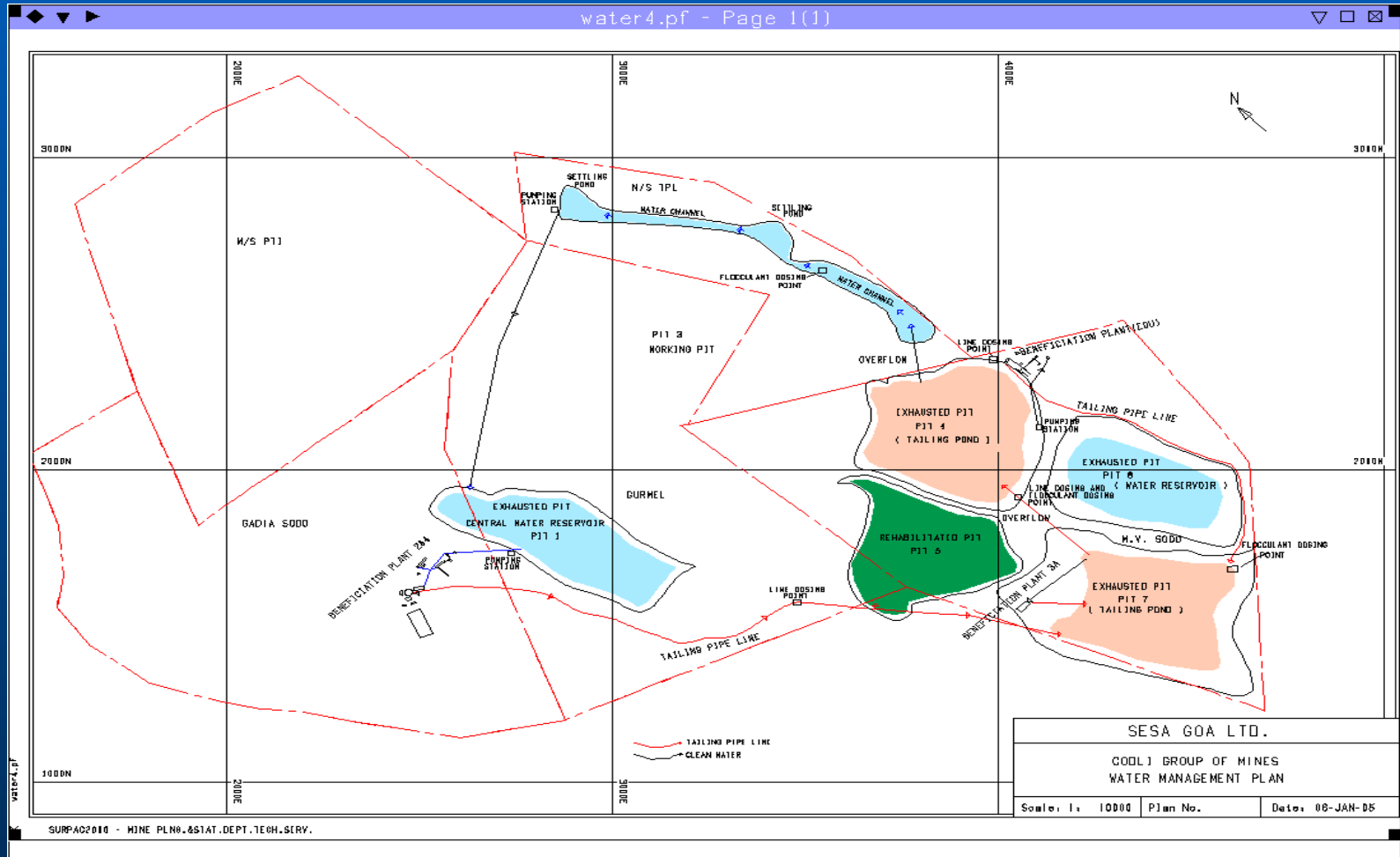
Water :

- < Cover dumps with Geo- textile.
- <Harvest rain water inside the mine for self use.
- < Ensure no dirty water outlet from mines by constructing appropriate barrier.
- < Clean the water before discharge through the sedimentation process, by using lime and flocculants.
- < Tailing water to accumulate in a tailing pond inside the mine (worked out pits) and re-circulate the water after treatment .
- < Mine closure plan should include Pisciculture pond OR reservoir for irrigation purpose.

SUSTAINABLE IRON ORE MINING – A CONTINUOUS JOURNEY



Sesa Practices: Water management plan



SUSTAINABLE IRON ORE MINING – A CONTINUOUS JOURNEY



Sesa Practices:

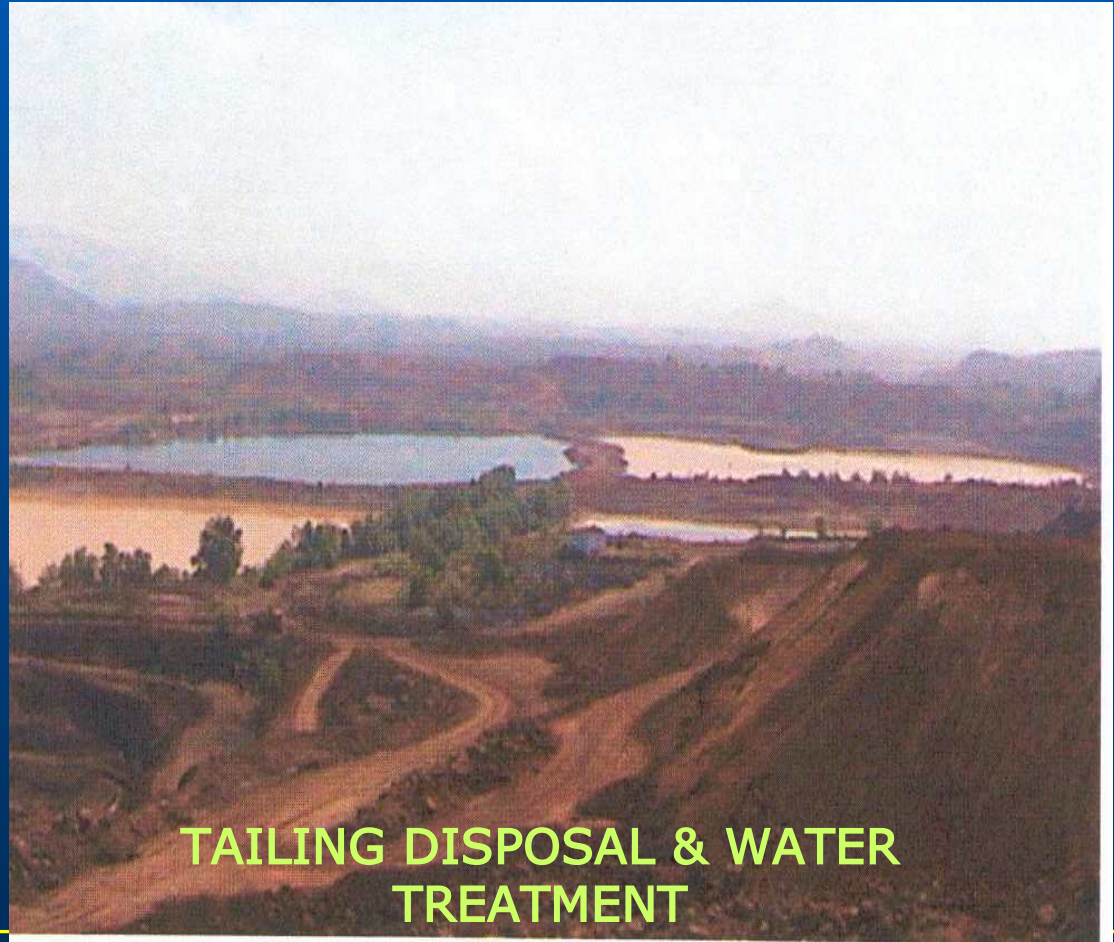
Mitigatory measures for water management - Beneficiation plant

BENEFICIATION PLANTS

Use of Water from
exhausted mining pit

Treatment of Effluent
by Lime & Flocculant
FOR REUSE

Total Re-circulation of
water in close circuit –
HENCE ZERO
DISCHARGE





Sesa Practices - Land Reclamation:

**GEOTEXTILES - A NEW
APPROACH FOR WASTE DUMP
MANAGEMENT**



**GEOTEXTILE LADEN MINE
DUMP – OTHER VIEW**



**GEOTEXTILE LADEN MINE
DUMP**

- **CONTROL SOIL EROSION**
- **DUMP STABILIZATION**
- **CONTROL WATER POLLUTION**



Sesa Practices - Land Reclamation:

PLANTATION GROWING ON A GEOTEXTILES LADEN DUMP



- Ensures green ground cover for erosion control as well as for soil enrichment
- Higher survival rate for tree species



Sesa Practices - Green Mining:

AGRI-HORTICULTURAL APPROACH

- Initially grow leguminous tree
- Selective thinning after four years
- Introduce horticultural plants – irrigation from exhausted mine pits.



Sesa Practices - Green Mining:

RECLAIMED MINE PIT CONVERTED INTO PISCICULTURE POND



SUSTAINABLE IRON ORE MINING – A CONTINUOUS JOURNEY



Social:

- ❑ Development of relationship with surrounding community is must for sustainable operation.
- ❑ Mines are mostly located in backward areas, so community expectations are high.
- ❑ Take care of basic social needs like drinking water, education, medical needs, etc.
- ❑ Develop basic infrastructures like roads, schools, hospitals, self employment training centres etc.
- ❑ Facilitate vocational training to local youth.
- ❑ Maximize local employment.

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SUSTAINABLE IRON ORE MINING – A CONTINUOUS JOURNEY



Social:

- Regular interaction with the Community Representatives to identify, execute and monitor community development projects.
 - Medical centre
 - Women's Self Help Groups
 - Infrastructure needs for local educational institutions
 - Specialized Medical Camps
 - R & D for enhancement of Agricultural productivity



Sustaining Value – Beyond Mining

Sesa Community Development Foundation

- * Established Sesa Technical School at Sanquelim Mine (Renovated Mine workshop)
- * Established Sesa Football Academy (By renovating Employee quarters on exhausted Sanquelim mine)
- * Football ground on Mine rejects dump
- * Founder member of Mineral Foundation of Goa (MFG)
- * Pooling of resources from various mining companies and execute social projects through MFG

Need Based Programmes;

- Health Awareness, Crop Improvement,
- Nutritional assistance, educational aids
- Establishment of women self help groups , Nature club in Schools
- provision of civic amenities etc.

SUSTAINABLE IRON ORE MINING – A CONTINUOUS JOURNEY



Sesa Technical School established under Community Development Foundation



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Sesa Technical School established under Community Development
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SUSTAINABLE IRON ORE MINING – A CONTINUOUS JOURNEY



Sesa Football Academy established under Community Development Foundation



SUSTAINABLE IRON ORE MINING – A CONTINUOUS JOURNEY



Community Medical Centre at village
Amona, Goa

SUSTAINABLE IRON ORE MINING – A CONTINUOUS JOURNEY



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Community Medical Centre at village
Codli, Goa

SUSTAINABLE IRON ORE MINING – A CONTINUOUS JOURNEY



Crop Development Programme – Vagona



SUSTAINABLE IRON ORE MINING – A CONTINUOUS JOURNEY



CONCLUSION

- **Sustainability issue has to be kept in focus right from conceptual phase, for any mining operation.**
- **Cost associated thereto needs to be necessarily viewed as basic cost to run the business rather than appropriation of profits.**
- **Scope for Eco-tourism after the mine closure**

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THANK YOU