Sustainable Development  Mining Practices

Presented at the Conference on Sustainable Mining and United Nations Framework Classification – Challenges and Opportunities in India

At Hotel Eros, Nehru Place, New Delhi on 29th -30th October, 2013

By:- Mahesh K Patil, AVP-HSEC, Sesa Sterlite Ltd.
IFC Sustainability Framework

IFC’s Sustainability Framework articulates the Corporation’s strategic commitment to sustainable development, and is an integral part of IFC’s approach to risk management.

- **IFC Policy**: IFC’s commitments, roles, and responsibilities related to environmental and social sustainability.
- **Performance Standards**: Provides guidance on how to identify and manage risks and impacts, as a way of doing business in a sustainable way.
- **IFC’s Access to Information Policy**: Reflects IFC’s commitment to transparency and good governance on its operations.
EQUATOR PRINCIPLES (1-10)

IFC PERFORMANCE STANDARDS (PS 1-8)

POLICIES (1-8)

Technical Standards

Management Standards (MS 1-14)

Integrated Management System (QMS, EMS, OHSMS), SA 8000, ISO 27001
IFC Performance Standards

- **PS1**: S&E Assessment and Management Systems
- **PS2**: Labor and Working Conditions
- **PS3**: Pollution Prevention and Abatement
- **PS4**: Community Health, Safety & Security
- **PS5**: Land Acquisition and Involuntary Resettlement
- **PS6**: Biodiversity Conservation and Sustainable Natural Resource Management
- **PS7**: Indigenous Peoples
- **PS8**: Cultural Heritage
Roadmap to International Standards

Equator principles

IFC Performance Standards
GuidanceNotes
EHS Guidelines

Gap analysis (Third Party)

Sustainability Framework
COC & Values
Policies/TS/MS/Guidance notes

Gap analysis (Sustainability Assurance)

Units or Group companies

Subsidiary Company Internal Management Systems
ISO 14001, 9001, OHSAS1800, SA 8000

Implementation of International Standards in all Operations
Sustainability Assessment Model

**MANAGEMENT STANDARDS**

- Compliance
- Leadership
- Objectives, Targets & Performance
- Competency & Training

**MANAGEMENT PROCESSES**

- Supplier & contractor Management
- New Projects
- Incident investigation
- Stakeholders Engagement
- Resource use & Waste Management
- Audits – Management review
- Management of change
- Documentation & procedures
- Human rights, Social & Security

**POLICIES & TECHNICAL STANDARDS**

- Water & Biodiversity Management
- Energy & Carbon
- HSE Management
Conduct ESIA as per IFC standard

Establish the Monitoring Mechanism

measuring the SDF performance as per GRI principles

And publish Sustainable Development Report
GRI Indicators for Sustainability Reporting

- Economic Performance Indicators
- Environment Performance Indicators
- Labour Practices & Decent Work Performance Indicator
- Human Right Performance Indicator
- Social Performance Indicator
- Product Responsibility
- Mining & Metal Indicators
Sustainability Reporting

- Corporate Sustainability Report (SD Report) from the year 2005-06 as per GRI guidelines assured by third party and available on web site
- All the SD Reports are available on GRI website
- Carbon Disclosure Program from 2006-07 onwards
• **In order to be sustainable in mining;**
  
  – Watch out for global trends in sustainable development and implement best practices.
  
  – Monitor, measure and report the impact of operations to stakeholders, viz. GRI, NVG, BRR
  
  – Adopt and implement sustainability principles of national/international framework / conventions viz. IFC, ICMM, IUCN
Thank You
Some of the Best Practices – World Wide

LKAB
LKAB Worldwide (Luossavaara_Kiirunavaara-Aktiebolag)

- 4,000 employees
- 13% women
- About 30 companies, which includes Railways, explosives, Blasting Companies
- In about 15 countries
- 650 employees outside Sweden

- **Total Iron Ore Production**: 23,8 Mton
- **Global Exports**: 17,8 Mton
- **Pellet Production**: 19,9 Mton
- **Pellet Exports**: 13,0 Mton
Kiruna Orebody – 80 mtrs thick and 4 km in strike, Dip is 60 degrees

Reserves
(Proven and Probable)
above level 1365 m
- 684 Mt

Special exploration pass to reduce cost

Ore is expected to go up to 2000 level
At Narvik, LKAB is shifting from conventional stacker reclaim operation to “Silo – Conveyor” feeding operation – 11 silos of 60 x 40 mtrs are being constructed - CAPEX – USD 160 Milion.

This will help in reducing air pollution and manpower.

Narvik city

New railway line

Existing railway line
Kiruna City shall be relocated as the Ore Body is dipping towards the City

Influence lines year 2013, 2023, 2033
Narvik is a Natural Port with 27 mtrs of Draft.

- Loading capacity – 4000 mtrs/hr
- 3 Company owned Tugs.
- Final product is screened before loading.
- Largest Ship loaded 242000 DMT
At Narvik, LKAB is shifting from conventional stacker reclaimer operation to “Silo – Conveyor” feeding operation – 11 Silos of 60 X 40 mtrs are being constructed - CAPEX – USD 160 Milion.

This will help in reducing air pollution and manpower.
<table>
<thead>
<tr>
<th>Few of the best practices at LKAB</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shifting of township</td>
<td>LKAB has separate team for discussion with the stake holders on time bound manner. The team comprise of internal and external agency persons. The land is purchased at Market rate</td>
</tr>
<tr>
<td>Automatic sampling from Mines to plants to final product (Pallets)</td>
<td>Reduces time and increases efficiency</td>
</tr>
<tr>
<td>Continuous monitoring of plant feed.</td>
<td>This will improve productivity and quality</td>
</tr>
<tr>
<td>Statistical Process control charts</td>
<td>These charts are developed with data generated from process. To attract the attention, the system shows only markers. This saves time for the operators for quick action</td>
</tr>
<tr>
<td>Special department by name Production planning</td>
<td>This department co-ordinates amongst Marketing, Logistics, Mine planning and Production and continuously monitor the budget vs actual. This dept also works out for any change in production plan.</td>
</tr>
<tr>
<td>Total Plant recovery – 63%</td>
<td>Loss in tailing</td>
</tr>
<tr>
<td>Feed grade – 45%</td>
<td>• In Sorting Plant – 25% - dry tailing</td>
</tr>
<tr>
<td></td>
<td>• In concentrate plant - 12% - Wet tailing.</td>
</tr>
</tbody>
</table>
Some of the best practices – world wide

VALE
Vale is the world’s largest producer of iron ore, pellets and second largest producer of nickel

Company Overview
- World’s largest iron ore & iron ore pellets producer with 25% share of global seaborne iron-ore market
  - Owns highest grade iron-ore mines in the world (63%-67% Fe content)
- World’s second largest Nickel producer
- Operates largest logistics network in Brazil
- Portfolio includes Potash, Copper, Coal, Fertilizers, Energy, Kaolin, Manganese, Ferroalloys

Revenues
- 1997 Total = $3.86 bn
- 2010 Total = $46.5 bn

Global Presence
- Vale’s presence in terms of JVs, operations, projects, R&D, exploration

Current Shareholder Composition
- Valepar: 33.3%
- Non-Brazilian Investors: 39.7%
- Brazilian Investors: 21.5%
- Federal Government: 5.5%

Vale is listed on BOVESPA, NYSE, Euronext, BMAD, SEHK
- Government holds certain special shares providing it veto power in special cases
- Of the 21.5% held by Brazilian investors, Institutional investors hold 11.5%
Increasing energy self-sufficiency to maintain cost competitiveness has been another focus area for the company.

**Key Drivers**

- **Increasing Power Requirements:** Vale’s power requirements have grown significantly over the past 10 years.
- **Supply Risk:** Increasing power consumption has led to shortage of grid power supply in Brazil.
- **Climatic Risk:** Brazil obtains 77% of their power from hydroelectricity.
- **Regulatory Interventions:** Special tariffs and rationing have been implemented in the past in Brazil (2001-02 Energy Crisis).
- **Price Volatility in energy market:** Large variation in spot prices of power.

**Measures Currently Undertaken**

- **Captive electricity generation:** Operates 15 hydroelectric plants & multiple diesel generators across Brazil, Canada & Indonesia (wholly owned/JV based).
- **Alternate energy sources:** Undertaken efforts since 2007, for setting up biodiesel production facilities in Brazil and building hydrocarbon exploration portfolio in South America & Africa.
- **Conventional Methods:**
  - **Energy Auctions:** Successful power purchase bids in auction conducted by Brazil government in 2005.
  - **Long term power contracts**

**Current State**

<table>
<thead>
<tr>
<th>Year</th>
<th>Self-generated</th>
<th>State Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>45%</td>
<td>55%</td>
</tr>
</tbody>
</table>

*Vale is one of the largest consumers of electricity in Brazil - The company’s spend on energy is close to 15% of the total operating cost.*
Vale has also invested significantly on R&D initiatives targeted on sustainable development, mining process and renewable energy.

**Sustainable Development**
- Belém Center set-up to focus on R&D efforts in area of climate change, water management, biodiversity, and technology for environmental monitoring.
- Recycles 18,000 tons of waste annually, such as paper, glass and plastic.

**Mining Process**
- Ouro Preto Center is being set-up to focus on technological advancements in areas such as metallurgy, mineral processing, mining/exploration and prospecting & geology.
- Developing and implementing technological solutions in partnership with experts e.g. Alliance with Scania to develop series of single-speed engines for stationary operation (use in mining).

**Renewable Energy**
- Technology center to be set-up in São Paulo to focus on energy renewability and low-carbon energy generation using solar, wind, geothermal and other sources.
- Budgeted $305 Mn (2009-14) to produce bio diesel from palm oil, along with JV partner, Biopalma da Amazonia.
- Accord with Brazil’s federal agricultural research body Embrapa on the use of nanotechnology in fertilizers production, carbon capture, and the use of Brazilian fruits in energy production.

**Example**

**Sustainable development in Mining: Vale’s Dry Iron-Ore Processing**

Reduction of water, energy consumption, CO2 emissions, maximization of recovery rate.

Vale has invested close to $3.5bn (~10% of Capex) on R&D efforts in the last 5 years.
Vale is committed to sustainable development and has been focusing its CSR efforts in 2 main areas – Environment and Social Development.

**Focus Areas**

- **Environment**

  - Climate change leaders: Worked towards soliciting voluntary commitments from 30 large Brazilian companies towards management of Greenhouse Gas.
  - In 2007, the Vale Florestar project was commissioned to promote reforestation on degraded areas with native and exotic species.
  - Vale nature reserve in Brazil was declared Atlantic Forest Biosphere Reserve by UNESCO in 2008 due to its importance in conserving flora and fauna.
  - Vale’s initiatives contribute to the performance of its Environment Quality Management System (based on ISO 14001 standards).
    - In 2009, for example, Vail reforested degraded areas, put environmental control equipment into service.

- **Social Development**

  - Set up ‘Vale Knowledge Stations’ for children from 6 to 18 years of age to engage them in sports and educational activities – extending to Colombia and Mozambique.
  - In 2009, Vale contributed to a United Nations social initiative by participating in consultation in Latin America.
  - Vail uses a Front-End Loading (FEL) methodology to analyze feasibility of new projects which covers social, health, safety and environmental aspects.
  - Launched Brazil Going for Gold program, to select and prepare athletes in judo, swimming and athletics.
  - Work with various community groups and local government agencies to facilitate integrated action.

**Key Initiatives**
The company has successfully applied 4 key levers aimed at gaining visibility and establishing itself as a “global leader” in this domain.

**CSR Operational Levers**

1. **“Vale branding” of several strategic initiatives**
   - Launched various programs under the “Vale” brand
     - Vale Florestar project to promote reforestation
     - Vale Knowledge station to engage children in sports & educational activities

2. **Strong collaboration with Government & other agencies**
   - Strong relationships with governments and civil society through participation in associations like International Council on Mining and Metals (ICMM)
   - Engaged in alliances/Partnerships with active state/non-state agencies
     - In 2010, set-up the biggest reforestation fund in Brazil in partnership with national development bank BNDES

3. **“Grass roots” level involvement in the local community**
   - Develop programs, actions and projects to enhance presence in the local communities
     - Vocational training programs related to mining to help maximize local hiring: in 2009, local hiring represented 77% of total hiring within vale

4. **Robust reporting and performance tracking**
   - Annual sustainability reports published to share information with stakeholders on company management accountability towards sustainability efforts
   - Established internal guidelines and principles for sustainability
   - Approved its human rights policy in 2009 by launching a Human Rights guide

**CSR is a core focus area for senior management— the Company made extensive social and environmental investments in 2009, totaling $781 Million**
Some of the best practices –

SESA GOA
Sustainability Reporting

- Corporate Sustainability Report (SD Report) from the year 2005-06 as per GRI guidelines assured by third party and available on web site

- All the SD Reports are available on GRI website

- Carbon Disclosure Program from 2006-07 onwards
Environmentally, technically and scientific reclamation of mined out areas enabling sustainable post closure of land uses

- In our business, it is an accepted fact that the impact we leave on the environment has a long-term, negative impact.
- Which is why our efforts to preserve and protect, while we simultaneously grow, are of immense importance and integral to the way we do the business.
- With the same objective, Sesa has reclaimed its one of the worked mine and converted it to a beautiful garden.
- Sesa has also constructed a technical School and Football academy at the reclaimed site.
- Pit has been converted to a Pisciculture pond,
- A nakshatra garden, fruit bearing trees and butterfly park is set up in the Garden.
- The need for a convention centre for visits by school children, delegates nature lovers etc at the Sanquelim mine, led to the concept of a Bamboo pavilion as no other solution suited the requirement better than bamboo as the medium for building the pavilion.
Sanquelim Mine reclamation

Afforested waste dump - before and after

Pisciculture Pond
Model Reclamation at Sanquelim Mine – Astral Garden, Medicinal Garden, Butterfly Garden, Bamboo Pavilion
**CSR Approach**

**Our approach to CSR:**
- Partnership based (vs. limited need based)
- Full time person for village community engagement
- Evaluation of Village Panchayats’ needs central to setting CSR agenda
- Vision on creating ‘model’ villages (“Gram nirman”) based on villager’s needs

<table>
<thead>
<tr>
<th>Educational Initiatives</th>
<th>Health</th>
<th>Community Development</th>
<th>Mineral Foundation of Goa</th>
</tr>
</thead>
</table>
| **Degree in Mining Engg.** - commencing from 2011-12 at Goa Engg. College. **Sanquelim ITI + South Goa ITI** - from 2011-12 **VCEP Project** for computer aided learning for school children: in 404 schools of Goa & 250 of Chitravara Aanganwadi and Baalwadi schools | **CMCs and MHUs**
Aimed at providing health facilities for community around our business areas. **Sesa is operating 12 CMCs and 2 MHUs** in the States of Goa, Karnataka, Orissa and Jharkhand **catering to 14 villages and around 50,000 people** | **SCDF foundation runs Sesa Football Academy** which nurtures future footballers **ALOP:** capacity building, improved farming practices, water shed development, micro enterprise, livestock development of ~ 1000 households in 6 villages | **Sesa Goa is one of the founder members and the largest contributor to Mineral Foundation of Goa, an NGO which addresses environmental & social issues in mining belt of Goa.**

*Touching the lives of thousands of persons through continuous efforts and building Sesa’s brand*
Alternate Livelihood Opportunities project

- Scope of the project (target group, location, etc)
  - Sesa-Goa Ltd has production unit in Chitradurga district of Karnataka state; this has created a lot of employment opportunities directly and indirectly for the villagers in the cluster. However, the majority of the people surrounding business unit are belonging to SC, ST and OBC, they dependent much on farming activity with their very small land holdings. So, there was need to educate rural community on development possibilities in farming and also opportunities for alternative enterprises for sustainable livelihood. In 2008, University of agricultural Sciences Dharwad took lead role in developing and implementing the project entitled “Alternative Livelihood Opportunities Project (ALOP)” in time period of 4 years. The project was initiated in 4 village hamlets where majority of the people were belonging to Scheduled Caste and Scheduled Tribe and all of them are coming under the BPL category.

- Highlight the People, Planet Profit Component i.e. (social, environment and economic dimensions of sustainability)
  The project implementation was started in association with University of Agriculture and Science Dharwad, achieving following objectives.
  - To build the capacity of farmers and farm women in soil, water, vegetation and livestock management for improving the productivity and economic returns
  - To demonstrate improved crop production technologies in farmers field
  - To demonstrate off farm micro enterprises in food processing and value addition with women groups
  - To encourage people institutions and facilitate linkages with development departments
How we did it?

- **Process Orientation and Capacity Building Framework**
  - Awareness camps
  - Participatory appraisal
  - Resource analyses
  - Entry point activities

- **Use of innovative sustainable Tools & Technologies**

  Community plays major role in implementation of all the project activities and it is considered as major decision making body at the village level. The committee is called as “Alternative Livelihood development Committee (ALDC)”. The committee consists of 11 members, among these 2 are elderly respected persons, 2 are women SHG members, 2 are progressive farmers, 1 is land less labour, 2 are retired employees and 2 are from project implementing & funding agencies. Panchayat members would be invitees for each committee meetings and Gram Sabha. This committee was entrusted with responsible for managing the project activities.
What has changed

Before and After

Project actives mentioned below has made a tremendous change in the life of the people from 4 village hamlets

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Activities</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Watershed development for conservation of soil and water</td>
<td>Soil erosion of fertile soil during rainy season, No proper system to storage rain water, which caused for low productivity in farm area.</td>
<td>2333 acres area brought under watershed and 549 families benefitted. Soil erosion was stopped up to 75% and there was 36% increase in productivity.</td>
</tr>
<tr>
<td>2</td>
<td>Established Medicinal Gardens</td>
<td>Non availability of medicinal plants for making tradition medicines.</td>
<td>3 villages, planted 30 diff. plants, People start to use traditional medicines, which saved their time and reduced treatment expenditures.</td>
</tr>
<tr>
<td>3</td>
<td>Organized Capacity building training and Conducted Farmer Field Schools to introduce new crop production technologies</td>
<td>New technology and farm practices was not known to the people</td>
<td>36 training programs conducted &amp; 823 people Participated and 75 camps conducted and 1715 people participated. Every one got accessed to modern farming tools and technology</td>
</tr>
<tr>
<td>4</td>
<td>Established Artificial Insemination Center and organised Animal health camps</td>
<td>Majority of people had house hold animals where the income generated was very low as well as maintenance cost was very high.</td>
<td>Covered 10 villages and 712 animals treated and organised 23 camps &amp; around 7834 animals treated. 30% increased productivity in milch animals and also drastic reduction in maintenance cost.</td>
</tr>
<tr>
<td>5</td>
<td>Introduced Integrated farming system (IFS)</td>
<td>It was single perennial crop farming system existing, which has given only seasonal income for the farmers</td>
<td>3950 plants In 15 7 acre &amp; 155 families benefitted. Multi cropping system has given them income all the year and also reduced their cost of production</td>
</tr>
<tr>
<td>6</td>
<td>Introduced Twin model of Vermin compost units</td>
<td>Usage of chemical fertilizers were costly and endangered the farm land</td>
<td>Implemented in 88 farmer fields, which used as the manure which kept the fertility of the land as well as reduced cost of production at large.</td>
</tr>
<tr>
<td>7</td>
<td>Promoted Biomass stove</td>
<td>Consumption of fire wood was high which also led for deforestation</td>
<td>1500 families benefitted, reduced consumption of firewood, reduced health problems for women. Reduced time for cooking for farming women.</td>
</tr>
<tr>
<td>8</td>
<td>SHG Promotion and training &amp; entrepreneurs development</td>
<td>Women were not organised, most of the women were idle, no savings habit among women.</td>
<td>SHG Formed - 22, No. of members – 333, women entrepreneurs – 83. Addition regular income created for the family. Introduction of micro finance.</td>
</tr>
</tbody>
</table>
Alternate Livelihood Development Committee Meeting

Exposure visit

Income Generation Activity (IGA)-Tailoring training

Skill development training
WATERSHED AND AGRICULTURE DEVELOPMENT PROGRAMM
## Beneficiaries

### Health
1. CMC - 10 centers  
   - Beneficiaries: 149,318  
2. MHU - 2 Units  
   - Beneficiaries: 13,704  
3. Health & Awareness Camps  
   - Beneficiaries: 153,234  
4. Neuro rehab center  
   - Beneficiaries: 1,114

### Education
1. VCEP - 395 schools in Goa and 2,000 schools in Karnataka  
   - Beneficiaries: 360,000  
2. SFA  
   - Beneficiaries: 141  
3. STS  
   - Beneficiaries: 750  
4. Educational Aid to schools like Uniform, Notebooks etc.  
   - Beneficiaries: 49,867  
5. Balwadi and Children festival  
   - Beneficiaries: 2,700  
6. Vocational Tuition classes and evening study centres  
   - Beneficiaries: 10,000  
7. Manthan  
   - Beneficiaries: 6,489  
8. Sesa Dnyan Jyoti Shishyavriti  
   - Beneficiaries: 57 schools, 670 Students  
9. Aanganwadi and Balwadi projects  
   - Beneficiaries: 3,964

### Special Projects
1. Gram Nirman  
   - Beneficiaries: 13,856  
2. ALOP (1,100 households)  
   - Beneficiaries: 6,000

### Women Empowerment
1. Training course for SHGs  
   - Beneficiaries: 500

### Back To Farming
1. Reviving paddy fields  
   - Beneficiaries: 500  
2. Distribution of seeds and fertilisers  
   - Beneficiaries: 500 families  
3. Drinking Water Scheme at Kirlapal Dabal  
   - Beneficiaries: 5700  
4. Around 2,100 acres brought under watershed development in Karnataka  
   - Beneficiaries: 4 villages  
5. Distribution of smokeless biomass stoves in Karnataka  
   - Beneficiaries: 849

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~ Half a million lives touched... ~
GRI Indicators for Sustainability Reporting

- Economic Performance Indicators
- Environment Performance Indicators
- Labour Practices & Decent Work Performance Indicator
- Human Right Performance Indicator
- Social Performance Indicator
- Product Responsibility
- Mining & Metal Indicators
<table>
<thead>
<tr>
<th>EC</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC1</td>
<td>Direct economic value generated and distributed, including revenues, operating costs, employee compensation, donations and other community investments, retained earnings, and payments to capital providers and governments.</td>
</tr>
<tr>
<td>EC2</td>
<td>Financial implications and other risks and opportunities for the organization's activities due to climate change.</td>
</tr>
<tr>
<td>EC3</td>
<td>Coverage of the organization's defined benefit plan obligations.</td>
</tr>
<tr>
<td>EC4</td>
<td>Significant financial assistance received from government.</td>
</tr>
<tr>
<td>EC5</td>
<td>Range of ratios of standard entry level wage by gender compared to local minimum wage at significant locations of operation.</td>
</tr>
<tr>
<td>EC6</td>
<td>Policy, practices, and proportion of spending on locally-based suppliers at significant locations of operation.</td>
</tr>
<tr>
<td>EC7</td>
<td>Procedures for local hiring and proportion of senior management hired from the local community at significant locations of operation.</td>
</tr>
<tr>
<td>EC8</td>
<td>Development and impact of infrastructure investments and services provided primarily for public benefit through commercial, in-kind, or pro bono engagement.</td>
</tr>
<tr>
<td>EC9</td>
<td>Understanding and describing significant indirect economic impacts, including the extent of impacts.</td>
</tr>
<tr>
<td>EN1</td>
<td>Materials used by weight or volume.</td>
</tr>
<tr>
<td>------</td>
<td>------------------------------------</td>
</tr>
<tr>
<td>EN2</td>
<td>Percentage of materials used that are recycled input materials.</td>
</tr>
<tr>
<td>EN3</td>
<td>Direct energy consumption by primary energy source.</td>
</tr>
<tr>
<td>EN4</td>
<td>Indirect energy consumption by primary source.</td>
</tr>
<tr>
<td>EN5</td>
<td>Energy saved due to conservation and efficiency improvements.</td>
</tr>
<tr>
<td>EN6</td>
<td>Initiatives to provide energy-efficient or renewable energy based products and services, and reductions in energy requirements as a result of these initiatives.</td>
</tr>
<tr>
<td>EN7</td>
<td>Initiatives to reduce indirect energy consumption and reductions achieved.</td>
</tr>
<tr>
<td>EN8</td>
<td>Total water withdrawal by source.</td>
</tr>
<tr>
<td>EN9</td>
<td>Water sources significantly affected by withdrawal of water.</td>
</tr>
<tr>
<td>EN10</td>
<td>Percentage and total volume of water recycled and reused.</td>
</tr>
<tr>
<td>EN11</td>
<td>Location and size of land owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas.</td>
</tr>
<tr>
<td>EN12</td>
<td>Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas.</td>
</tr>
<tr>
<td>EN13</td>
<td>Habitats protected or restored.</td>
</tr>
<tr>
<td>EN14</td>
<td>Strategies, current actions, and future plans for managing impacts on biodiversity.</td>
</tr>
</tbody>
</table>

Contd....
### Environment Performance Indicators

<table>
<thead>
<tr>
<th>EN15</th>
<th>Number of IUCN Red List species and national conservation list species with habitats in areas affected by operations, by level of extinction risk.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN16</td>
<td>Total direct and indirect greenhouse gas emissions by weight.</td>
</tr>
<tr>
<td>EN17</td>
<td>Other relevant indirect greenhouse gas emissions by weight.</td>
</tr>
<tr>
<td>EN18</td>
<td>Initiatives to reduce greenhouse gas emissions and reductions achieved.</td>
</tr>
<tr>
<td>EN19</td>
<td>Emissions of ozone-depleting substances by weight.</td>
</tr>
<tr>
<td>EN20</td>
<td>NOx, SOx, and other significant air emissions by type and weight.</td>
</tr>
<tr>
<td>EN21</td>
<td>Total water discharge by quality and destination.</td>
</tr>
<tr>
<td>EN22</td>
<td>Total weight of waste by type and disposal method.</td>
</tr>
<tr>
<td>EN23</td>
<td>Total number and volume of significant spills.</td>
</tr>
<tr>
<td>EN24</td>
<td>Weight of transported, imported, exported, or treated waste deemed hazardous under the terms of the Basel Convention Annex I, II, III, and VIII, and percentage of transported waste shipped internationally.</td>
</tr>
<tr>
<td>EN25</td>
<td>Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the reporting organization's discharges of water and runoff.</td>
</tr>
<tr>
<td>EN26</td>
<td>Initiatives to mitigate environmental impacts of products and services, and extent of impact mitigation.</td>
</tr>
</tbody>
</table>

Contd....
## Environment Performance Indicators

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN27</td>
<td>Percentage of products sold and their packaging materials that are reclaimed by category.</td>
</tr>
<tr>
<td>EN28</td>
<td>Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations.</td>
</tr>
<tr>
<td>EN29</td>
<td>Significant environmental impacts of transporting products and other goods and materials used for the organization's operations, and transporting members of the workforce.</td>
</tr>
<tr>
<td>EN30</td>
<td>Total environmental protection expenditures and investments by type.</td>
</tr>
<tr>
<td>LA1</td>
<td>Total workforce by employment type, employment contract, and region, broken down by gender.</td>
</tr>
<tr>
<td>-------</td>
<td>---------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>LA2</td>
<td>Total number and rate of new employee hires and employee turnover by age group, gender, and region.</td>
</tr>
<tr>
<td>LA3</td>
<td>Benefits provided to full-time employees that are not provided to temporary or part-time employees, by major operations.</td>
</tr>
<tr>
<td>LA15</td>
<td>Return to work and retention rates after parental leave, by gender.</td>
</tr>
<tr>
<td>LA4</td>
<td>Percentage of employees covered by collective bargaining agreements.</td>
</tr>
<tr>
<td>LA5</td>
<td>Minimum notice period(s) regarding significant operational changes, including whether it is specified in collective agreements.</td>
</tr>
<tr>
<td>LA6</td>
<td>Percentage of total workforce represented in formal joint management-worker health and safety committees that help monitor and advise on occupational health and safety programs.</td>
</tr>
<tr>
<td>LA7</td>
<td>Rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities by region and by gender.</td>
</tr>
</tbody>
</table>

Contd....
<table>
<thead>
<tr>
<th>LA8</th>
<th>Education, training, counselling, prevention, and risk-control programs in place to assist workforce members, their families, or community members regarding serious diseases.</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA9</td>
<td>Health and safety topics covered in formal agreements with trade unions.</td>
</tr>
<tr>
<td>LA10</td>
<td>Average hours of training per year per employee by gender, and by employee category.</td>
</tr>
<tr>
<td>LA11</td>
<td>Programs for skills management and lifelong learning that support the continued employability of employees and assist them in managing career endings.</td>
</tr>
<tr>
<td>LA12</td>
<td>Percentage of employees receiving regular performance and career development reviews, by gender.</td>
</tr>
<tr>
<td>LA13</td>
<td>Composition of governance bodies and breakdown of employees per employee category according to gender, age group, minority group membership, and other indicators of diversity.</td>
</tr>
<tr>
<td>LA14</td>
<td>Ratio of basic salary and remuneration of women to men by employee category, by significant locations of operation.</td>
</tr>
</tbody>
</table>
## Human Right Performance Indicators

| HR1 | Percentage and total number of significant investment agreements and contracts that include clauses incorporating human rights concerns, or that have undergone human rights screening. |
| HR2 | Percentage of significant suppliers, contractors and other business partners that have undergone human rights screening, and actions taken. |
| HR3 | Total hours of employee training on policies and procedures concerning aspects of human rights that are relevant to operations, including the percentage of employees trained. |
| HR4 | Total number of incidents of discrimination and corrective actions taken. |
| HR5 | Operations and significant suppliers identified in which the right to exercise freedom of association and collective bargaining may be violated or at significant risk, and actions taken to support these rights. |
| HR6 | Operations and significant suppliers identified as having significant risk for incidents of child labor, and measures taken to contribute to the effective abolition of child labor. |
| HR7 | Operations and significant suppliers identified as having significant risk for incidents of forced or compulsory labor, and measures to contribute to the elimination of all forms of forced or compulsory labor. |

Contd....
### Human Right Performance Indicators

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HR8</td>
<td>Percentage of security personnel trained in the organization's policies or procedures concerning aspects of human rights that are relevant to operations.</td>
</tr>
<tr>
<td>HR9</td>
<td>Total number of incidents of violations involving rights of indigenous people and actions taken.</td>
</tr>
<tr>
<td>HR10</td>
<td>Percentage and total number of operations that have been subject to human rights reviews and/or impact assessments.</td>
</tr>
<tr>
<td>HR11</td>
<td>Number of grievances related to human rights filed, addressed and resolved through formal grievance mechanisms.</td>
</tr>
<tr>
<td>SO1</td>
<td>Percentage of operations with implemented local community engagement, impact assessments, and development programs.</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>SO2</td>
<td>Percentage and total number of business units analyzed for risks related to corruption.</td>
</tr>
<tr>
<td>SO3</td>
<td>Percentage of employees trained in organization's anti-corruption policies and procedures.</td>
</tr>
<tr>
<td>SO4</td>
<td>Actions taken in response to incidents of corruption.</td>
</tr>
<tr>
<td>SO5</td>
<td>Public policy positions and participation in public policy development and lobbying.</td>
</tr>
<tr>
<td>SO6</td>
<td>Total value of financial and in-kind contributions to political parties, politicians, and related institutions by country.</td>
</tr>
<tr>
<td>SO7</td>
<td>Total number of legal actions for anti-competitive behaviour, anti-trust, and monopoly practices and their outcomes.</td>
</tr>
<tr>
<td>SO8</td>
<td>Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with laws and regulations.</td>
</tr>
<tr>
<td>SO9</td>
<td>Operations with significant potential or actual negative impacts on local communities.</td>
</tr>
<tr>
<td>SO10</td>
<td>Prevention and mitigation measures implemented in operations with significant potential or actual negative impacts on local communities.</td>
</tr>
</tbody>
</table>
# Product Responsibility

<table>
<thead>
<tr>
<th>PR1</th>
<th>Life cycle stages in which health and safety impacts of products and services are assessed for improvement, and percentage of significant products and services categories subject to such procedures.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR2</td>
<td>Total number of incidents of non-compliance with regulations and voluntary codes concerning health and safety impacts of products and services during their life cycle, by type of outcomes.</td>
</tr>
<tr>
<td>PR3</td>
<td>Type of product and service information required by procedures, and percentage of significant products and services subject to such information requirements.</td>
</tr>
<tr>
<td>PR4</td>
<td>Total number of incidents of non-compliance with regulations and voluntary codes concerning product and service information and labelling, by type of outcomes.</td>
</tr>
<tr>
<td>PR5</td>
<td>Practices related to customer satisfaction, including results of surveys measuring customer satisfaction.</td>
</tr>
<tr>
<td>PR6</td>
<td>Programs for adherence to laws, standards, and voluntary codes related to marketing communications, including advertising, promotion, and sponsorship.</td>
</tr>
<tr>
<td>PR7</td>
<td>Total number of incidents of non-compliance with regulations and voluntary codes concerning marketing communications, including advertising, promotion, and sponsorship by type of outcomes.</td>
</tr>
<tr>
<td>PR8</td>
<td>Total number of substantiated complaints regarding breaches of customer privacy and losses of customer data.</td>
</tr>
<tr>
<td>PR9</td>
<td>Monetary value of significant fines for non-compliance with laws and regulations concerning the provision and use of products and services.</td>
</tr>
</tbody>
</table>
### Mining & Metal Indicators

<table>
<thead>
<tr>
<th>MM1</th>
<th>Amount of land (owned or leased, and managed for production activities or extractive use) disturbed or rehabilitated.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MM2</td>
<td>The number and percentage of total sites identified as requiring biodiversity management plans according to stated criteria, and the number (percentage) of those sites with plans in place.</td>
</tr>
<tr>
<td>MM3</td>
<td>Total amounts of overburden, rock, tailings, and sludges and their associated risks.</td>
</tr>
<tr>
<td>MM4</td>
<td>Number of strikes and lock-outs exceeding one week's duration, by country.</td>
</tr>
<tr>
<td>MM5</td>
<td>Total number of operations taking place in or adjacent to Indigenous Peoples' territories, and number and percentage of operations or sites where there are formal agreements with Indigenous Peoples' communities.</td>
</tr>
<tr>
<td>MM6</td>
<td>Number and description of significant disputes relating to land use, customary rights of local communities and Indigenous Peoples.</td>
</tr>
<tr>
<td>MM7</td>
<td>The extent to which grievance mechanisms were used to resolve disputes relating to land use, customary rights of local communities and Indigenous Peoples, and the outcomes.</td>
</tr>
<tr>
<td>MM8</td>
<td>Number (and percentage) or company operating sites where artisanal and small-scale mining (ASM) takes place on, or adjacent to, the site; the associated risks and the actions taken to manage and mitigate these risks.</td>
</tr>
<tr>
<td>MM9</td>
<td>Sites where resettlements took place, the number of households resettled in each, and how their livelihoods were affected in the process.</td>
</tr>
<tr>
<td>MM10</td>
<td>Number and percentage of operations with closure plans.</td>
</tr>
<tr>
<td>MM11</td>
<td>Programs and progress relating to materials stewardship.</td>
</tr>
</tbody>
</table>
• In order to be sustainable in mining;
  – Watch out for global trends in sustainable development and implement best practices.
  – Monitor, measure and report the impact of operations to stakeholders, viz. GRI, NVG, BRR
  – Adopt and implement sustainability principles of national/international framework/conventions viz. IFC, ICMM, IUCN
Thank You