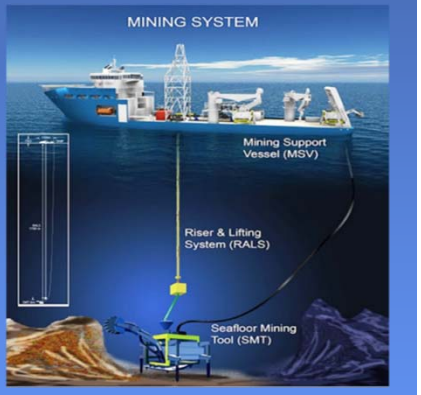
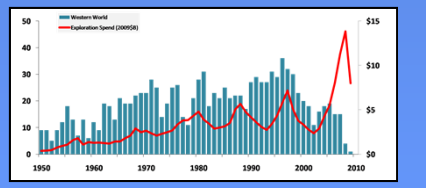
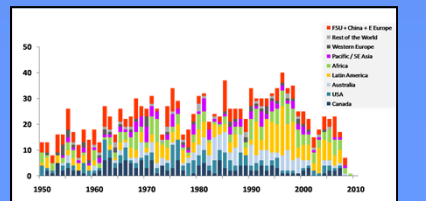
WORKSHOP ON
POLYMETALLIC NODULES RESOURCE CLASSIFICATION

International Seabed Authority
Kingston, Jamaica
&
Ministry of Earth Sciences, Government of India
Goa India
October 13, 2014



Session II
EMERGING INTERNATIONAL STANDARDS FOR MINERAL RESOURCE EVALUATION :
Information needs of financiers, investors and resource managers





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Key Messages:

- [Global Trends] There continues to be a global structural shift on what defines sustainable mining and the locations in which sustainable mining is taking place

- [Key Challenges Going Forward] Financiers, investors and resource managers will use sustainable development frameworks based on integrated landscape management, with emphasis on environmental / social performance. Regulatory compliance does not earn a social license to operate

Global Trend

A continued shift in where mining will take place

Global Trend: More Volatile Commodity Cycles

- Since 2000
  - Strong commodity cyclicity, increased volatility
  - Commodity super cycle led to doubling of metallic & tripling of energy prices
  - Market Response: strong increase in exploration and production

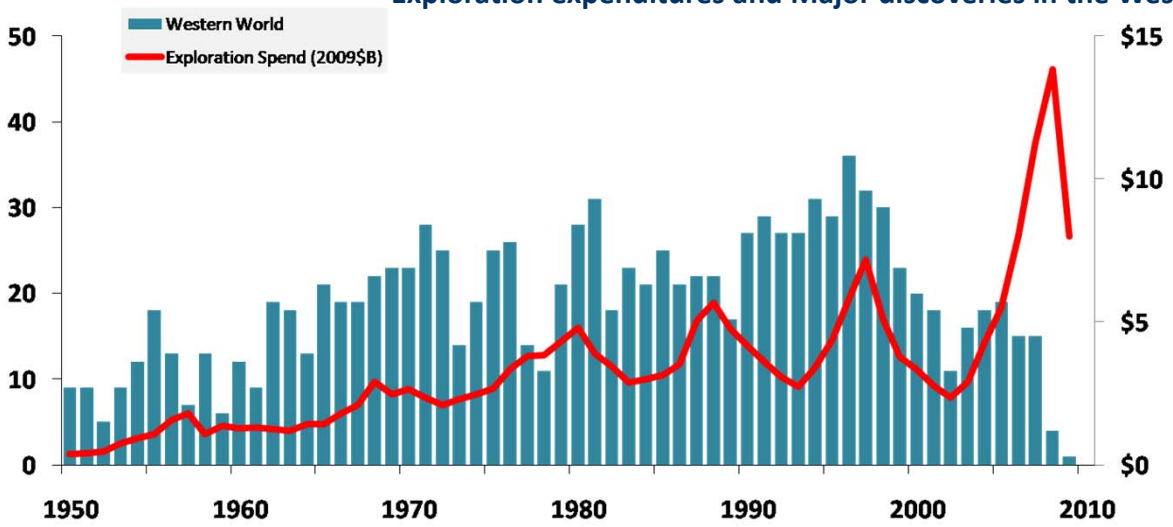
    14% increase of oil

    100% increase of iron

Source: McKinsey on Sustainability & Resource Productivity

- Even with improved production efficiency on resource extraction and use - global population growth & development is depleting existing resource inventories at an accelerating rate.

Exploration expenditures and Major discoveries in the Western World: 1950-2009



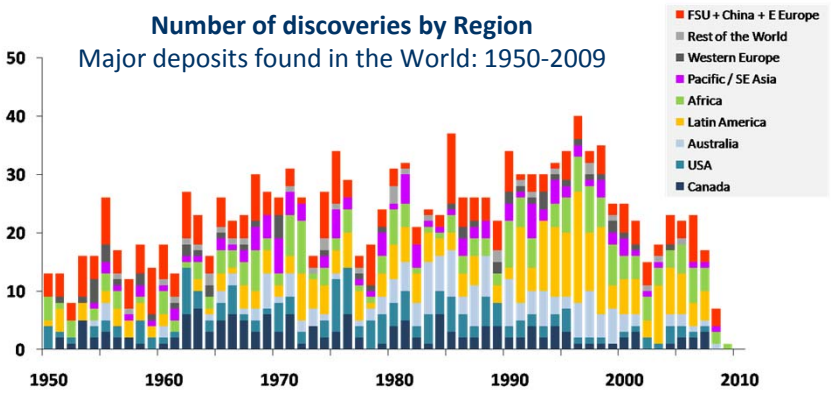
Global Trend: Limitations in Mine Financiability

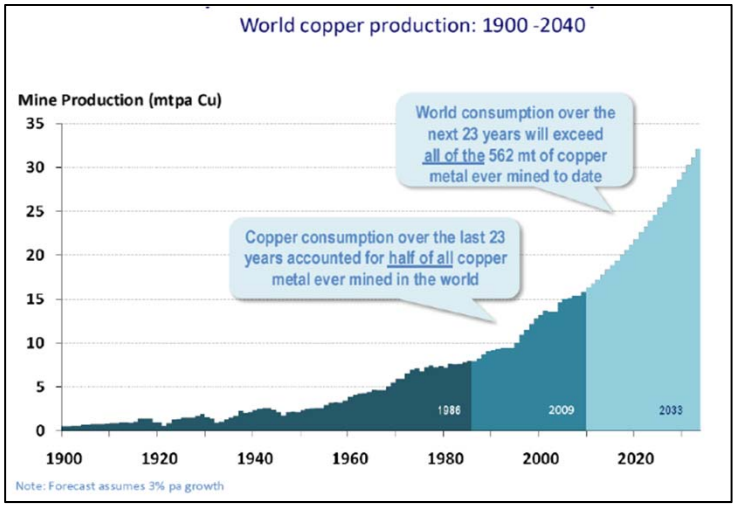
- Limiting factors constraining investors
  - Access to capital (sustainability requirement)
  - Continued open access to mineral resource lands
  - environmental / social factors
  - Geologic factors

- By 2030 → an estimated $11-17 trillion of new investment needed in mineral and oil and gas projects in lower-income countries

  Source: McKinsey on Sustainability & Resource Productivity

- 2012 average mine (bulk commodity) investment ~$3 billion, of which 60% is infrastructure. Proposed investments up to $12 billion

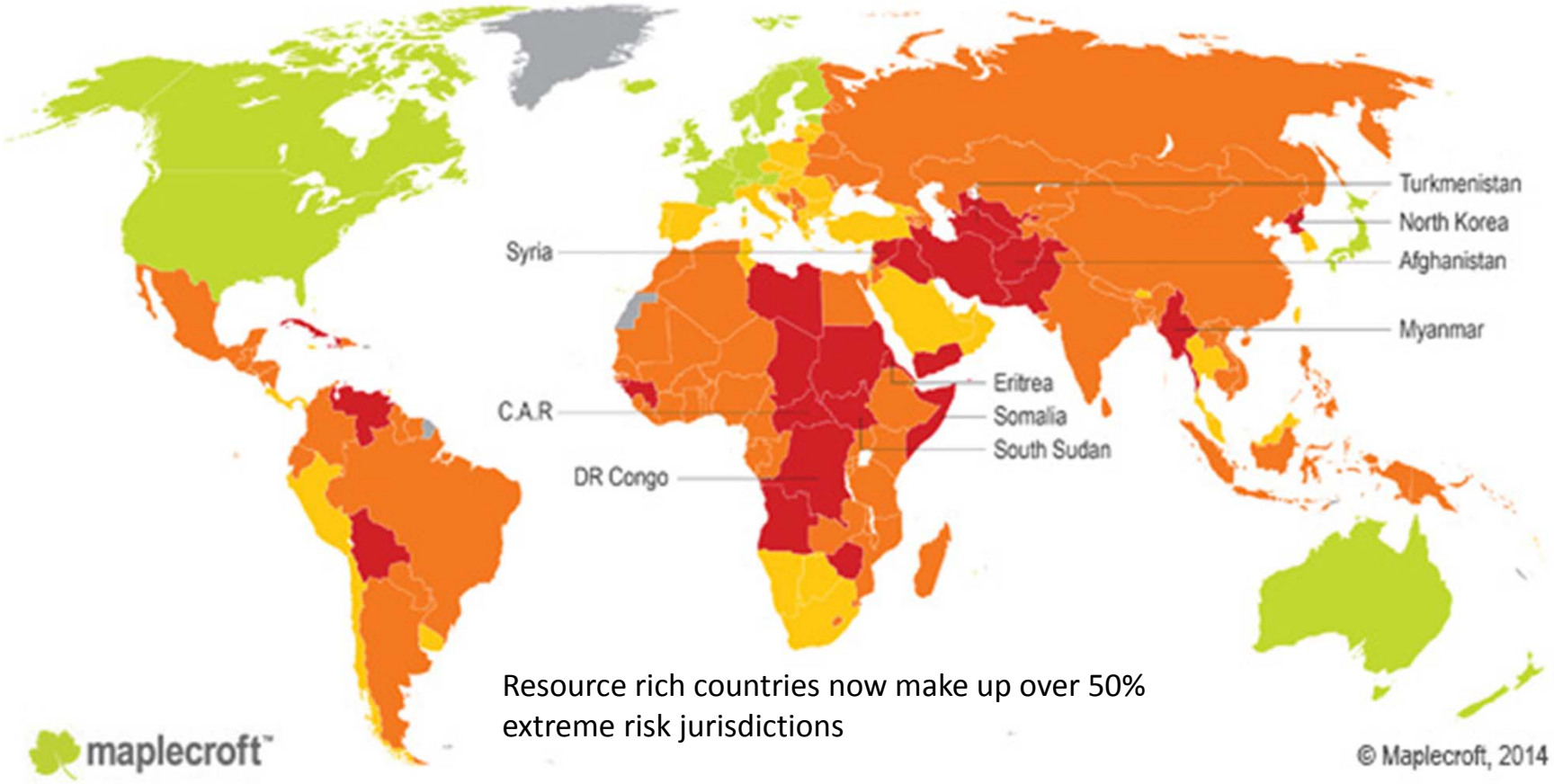




Global Trend: A Shift to Resource Rich Nations

- The share of resource investment shifting to developing nations facing weak governance challenges
- Diverse stakeholder group across government, developers, investors and society
- Benefits sharing (poverty reduction and shared prosperity) will influence the development decision

(Source: Macroeconomic Policy Frameworks for Resource-Rich Developing Countries, IMF 2012



Resource rich countries now make up over 50% extreme risk jurisdictions

Key Challenge to Investors, Financiers and Resource Managers -- Governance

A shift in what defines sustainable mining

Global Trends in Mining: Weak Governance → Increasing Risk

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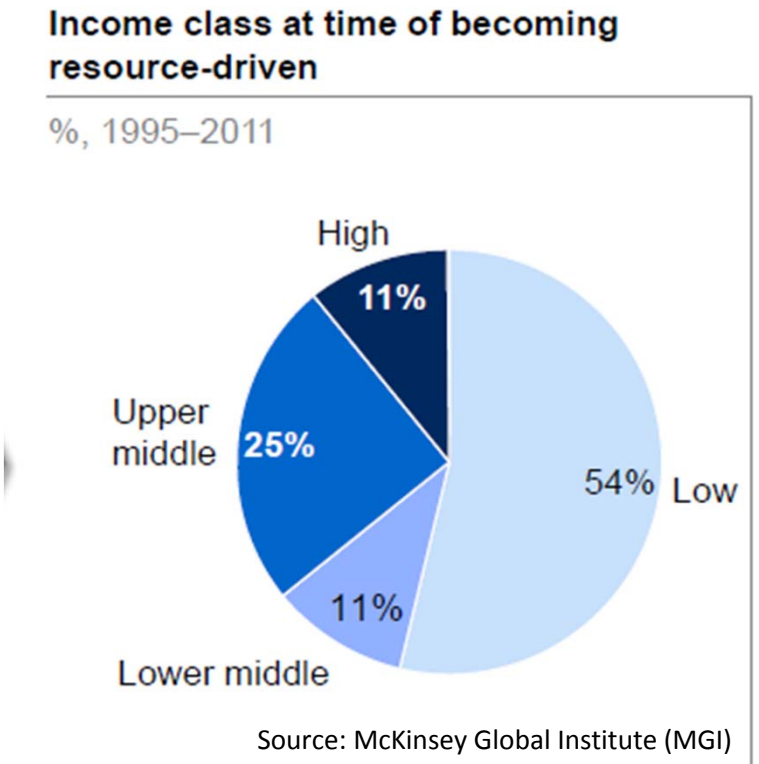
The number of resource-driven countries has increased by almost 40% since 1995 and most newcomers have low average incomes, with weaker regulatory regimes and monitoring / reporting capacity



Source: McKinsey Global Institute (MGI)

Governance -- **accountability** (the extent to which citizens can hold governments, political leadership and private companies responsible for their performance and conduct), **capability** (the ability of governments and public organizations to take decisions and get things done through effective policies and programs), and **inclusiveness** (ensuring that all stakeholders are consulted and taken into account in decision making processes – leading to legitimacy)."

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What Do Future Resource-Rich Nations Look Like (DSM)?

- Developing countries
  - Low GDP and HDI rating
    - Of the 7 world's lowest GDPs, 6 are Pacific Island Countries: FSM, Kiribati, Marshall Islands, Palau, Tonga and Tuvalu.
- Narrow resource base
  - Fisheries, tourism, remittances
- Small populations
  - Limited skill base
- Vulnerability & Remoteness
  - Climate change
  - Natural disasters
  - Food and water security
- Dispersed over large geographical area
- Small land mass
  - Pockets of overpopulation

Challenges: Governance and Investment Risk are inseparably intertwined

What mining companies need	
Investment Decision Criteria	***Instrument Available to the Government***
Geological Potential / Resource Certainty	Geological Survey providing basic geo-data and undertaking mineral resource assessment
Profitability of Potential operations – competitive fiscal regime, realistic foreign exchange controls	Investment Laws
Security of Tenure – clear, non-discretionary mining rights and title for permitting	Mining Cadastre
Consistency of Mineral Policy – clarity of roles & responsibility, stability of exploration / exploitation terms and conditions, mineral ownership (resource nationalism), social licence to operate	Mineral Policy Tax Legislation Community support
Stability of Legislation –predictable environmental / social obligations, non-discretionary transparent regulatory environment	Clear, consistent mining, environmental / social, and tax regulations
Availability of Infrastructure	Public Private Partnerships
Modified after (a) Transitional Islamic State of Afghanistan: Mining as a Source of Growth, Report No. 28231-AF, The World Bank 2004; and (b) James Otto – A Global Survey of Mineral Investment Preferences, Mineral Investment Conditions in Selected Countries of the Asia Pacific Region (United Nations ESCAP 1992).	

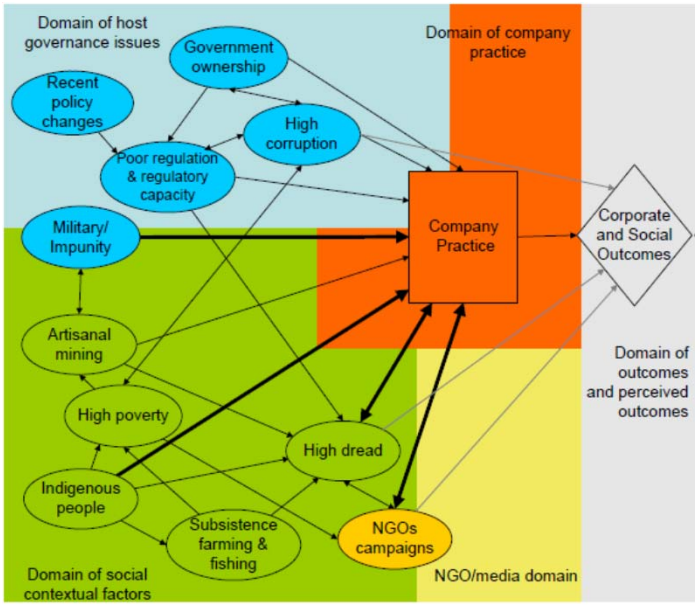
After geological potential – governments (governance systems) are the single largest determinant in where mining investments flow globally

Source: "Mining - Prospecting, Exploration and Feasibility including Ancillary Infrastructure." World Bank. Michael Stanley

Challenges: Investors / Resource Managers Need Good Governance

What the financial community needs:

- ✓ Social License to Operate
- ✓Certainty/ Security of Title/ Tenement
- ✓Certainty of Development Approvals
- ✓Confidence in Social/ Environmental context
- ✓Confidence in tax/ Royalty Regime
- ✓Acceptable level of Sovereign risk



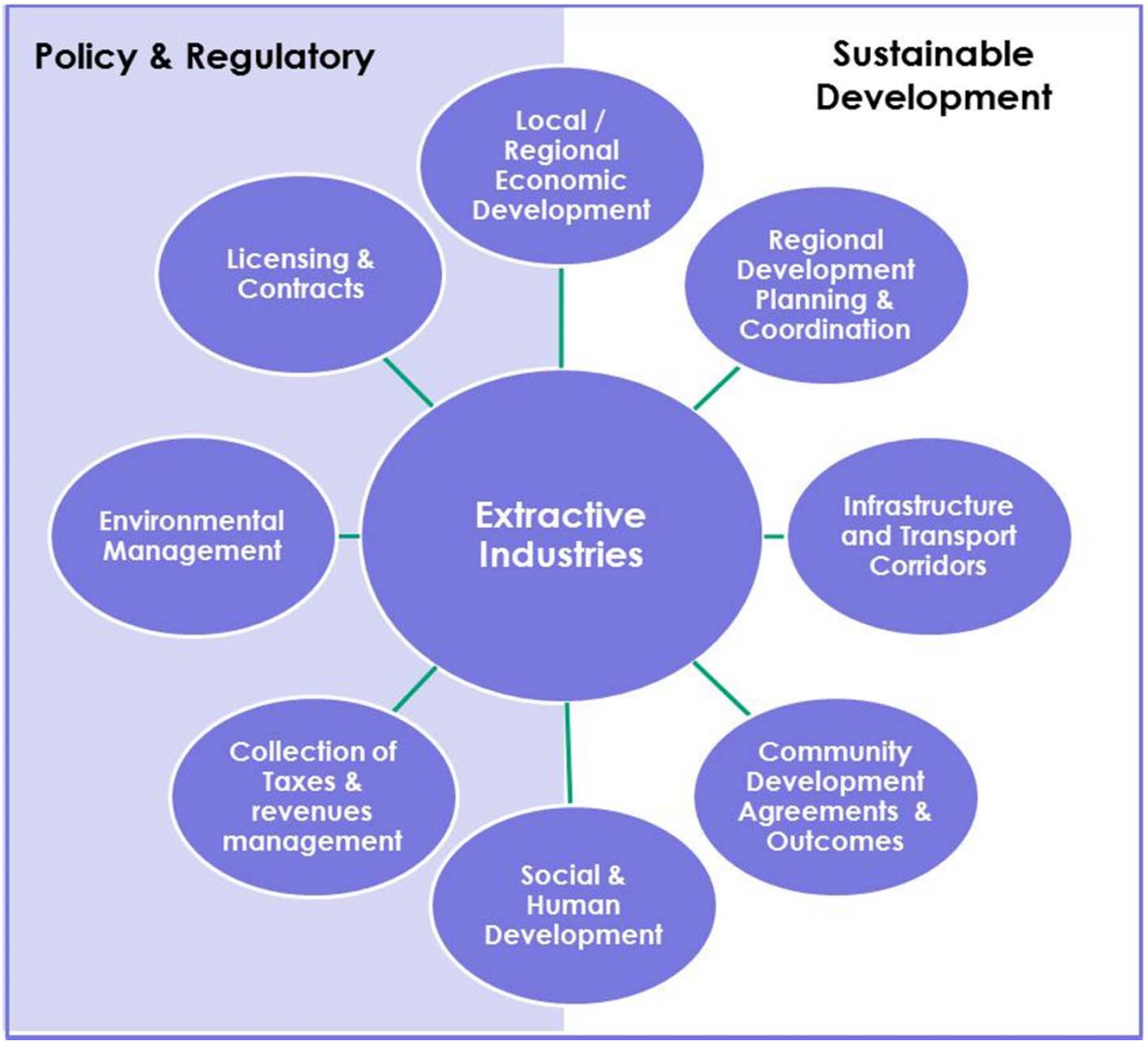
Source: "Mining Exploration, Corporate Social Responsibility and Human Rights: Untangling the Facts, Seeking Solutions". *Odell & Silva. PDAC Paper.*

Source: Mineral Exploration Wealth Creation Presentation: Behre Dolbear. 2009

"Now a miner, before he begins to mine the veins, must consider seven things, namely: the situation, the conditions, the water, the roads, the climate, the right of ownership, and the neighbors"

-- Georgius Agricola in De Re Metallica 1556

Challenges: Sector Governance / Investment Risk
Sustainability Frameworks are Integrators

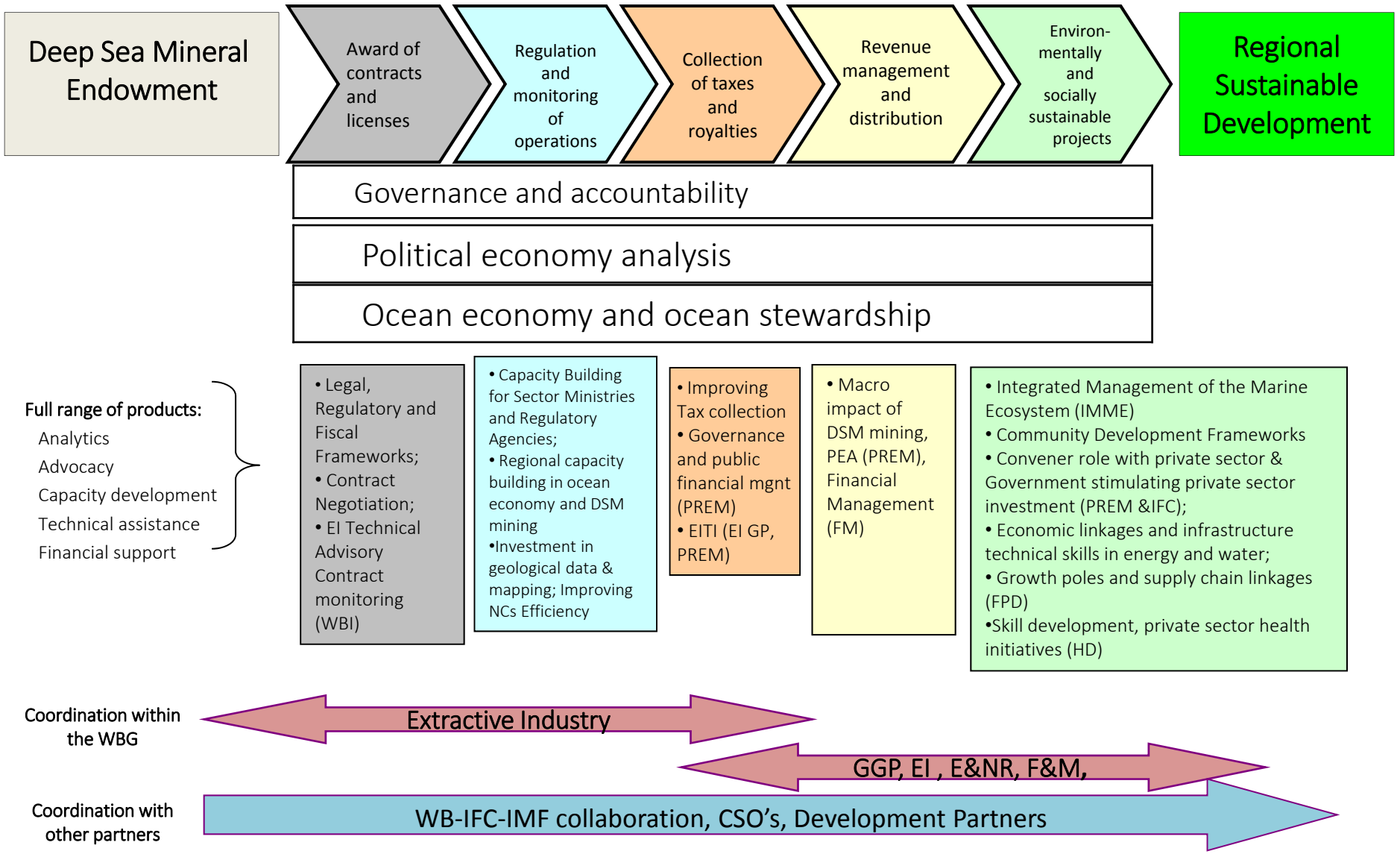


Outcomes

- ✓ Improved spatial planning
- ✓Shared Access Infrastructure
- ✓ Inclusive & integrated growth
- ✓Regional Economic Diversification
- ✓ Improved Livelihoods & Local Benefits
- ✓ Improved Human Development Indices (HDI's)

Sector sustainability is based on integrated spatial planning (integrated landscape management) through Sustainable Development Frameworks

DSM is a very Complex Sustainable Development Space



Challenge: Major Deficiencies Regulatory & Safeguard Compliance Monitoring

Safeguard Requirements

- **Information uncertainty with a multitude of challenges;**
  - Clarity of roles & responsibilities, transparent non-discretionary authority
  - Uncertainties regarding long-term sustainability
  - Effectiveness of policies, laws and regulation frameworks
  - Adequacy of institutional capacity to administer, monitor and enforce regulations
  - Verifiable mineral resource assessment information
  - Transparency in capturing, accounting and equitably distributing revenues
  - Fragility & conflict: Resources cross political & geographic boundaries
  - Technology-related complexities from exploration to possible future exploitation

- **Numerous historic failures to manage natural resources, especially in small, poverty stricken, remote islands**

- **There are many policies to which investors are required to comply:**

  - **World Bank Safeguard policies, IFC performance Standards, Equator Principles, Voluntary Principles, ICMM Community Toolkits & Partnerships for Development …**

Regulatory Challenges

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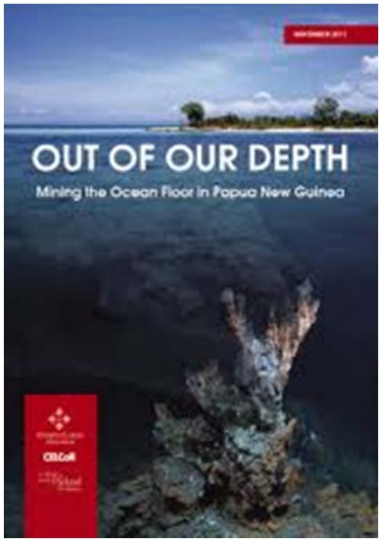
Developing Countries are characterized by:

- **Challenges to implement transparent, non-discretionary licensing processes, policy and law**
- **Challenges to ensure good governance**
- **Challenges to revenue management**
- **Institutional capacity weaknesses**
- **In-country skill-base**
- **Infrastructure for metallurgical processing**



Papua New Guinea (NGO Campaign) ➔

Nauru

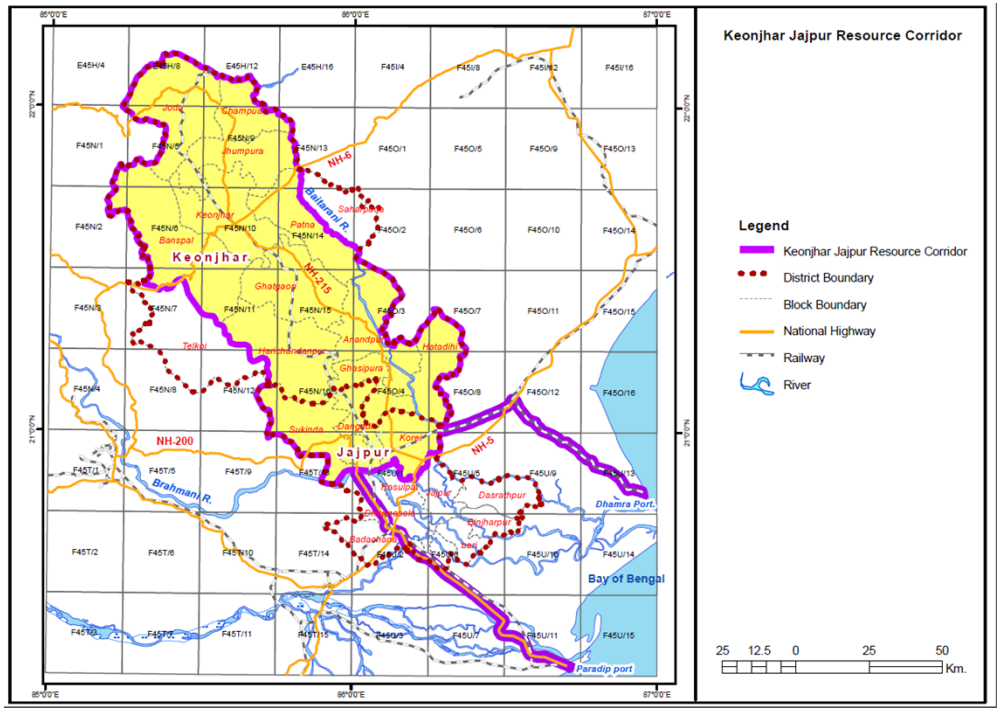
Key Challenge Going Forward

Financiers, Investors and Resource Managers require resource assessment information that supports sustainable development [[holistic landscape management using environmental / social sustainability performance measures]]

India, with its':

- depth of global science & engineering expertise
- state of the art management systems
- guiding policies (risk-based Sustainable Development Framework), regulatory agencies, and robust civil society

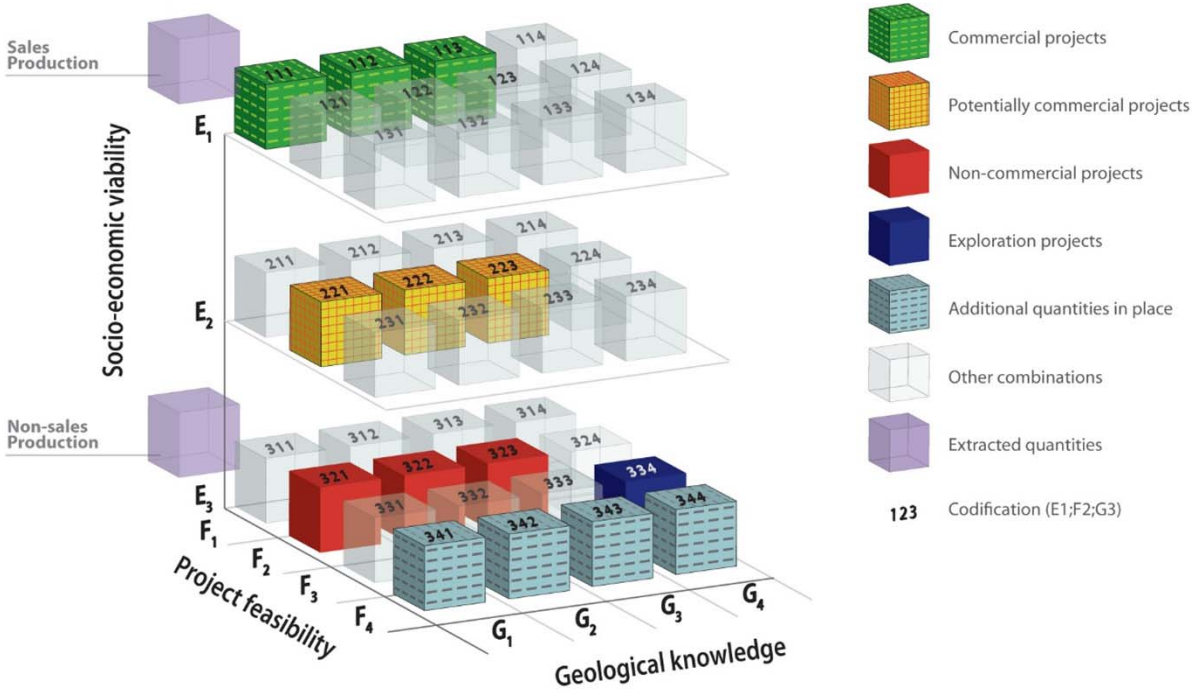
is <u>significantly challenged</u> to provide resource information that will ensure good governance / sustainable mining on mineral resource lands it has been administering for 50+ years (Shaw Commission, 2013)



The World Bank and ECE UNFC is assisting the Indian Bureau of Mines and State of Odisha in a pilot application to improve sustainability of mining in the Keonjhar District

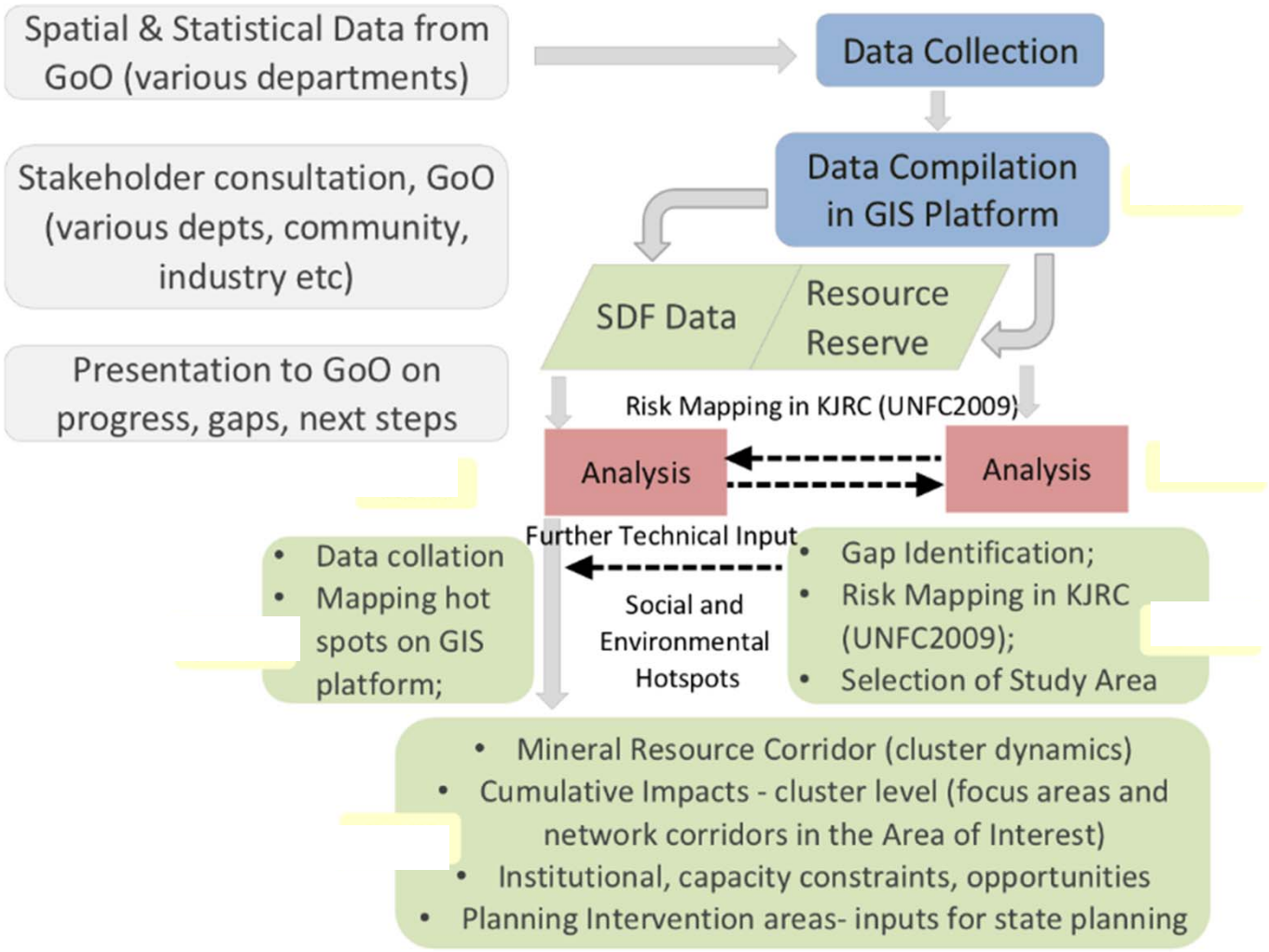
To Address Deficiencies:

- Translating to UNFC 2009
- Undertaking Integrated Spatial Planning using an advanced risk-based Sustainable Development Framework
- Reforming regulatory agencies, monitoring & reporting capacities



India is not currently meeting the information standard on what investors, financiers and resource managers need for sustainable mining (Shaw Commission 2013)

India Sustainable Mining Pilot – State of Odisha



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Key Messages:

- [Global Trends] Governance and Investment Risk are interwinned

- [Global Trends] Financiers, investors and resource managers will go beyond regulatory compliance into sustainability development frameworks based on integrated landscape management, with emphasis on environmental / social performance

- [Challenge Going Forward] Develop a resource classification system aligned with a sustainability development framework
  - resource classification aligned to a sustainability framework where investors, financiers and resource managers can clearly define the associated socio-economic impacts?
  - Inform the conversation around the social license to operate

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Thank You

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