

MINING AND THE SUSTAINABLE DEVELOPMENT GOALS¹

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Introduction:The world is becoming more closely interconnected through transportation, communication and interlinking technologies. This process of globalization has many implications for the national economy some of which are related to demand and supply and pricing of resources. Growth in population and consumption will inevitably place greater stress on natural resources and the environment, forcing science and society to seek more sustainable responses, and the nation's mineral development policy must be able to rise to the challenge.

With the changing global scenario in the way natural resources including minerals are viewed, the extractives industry must be leveraged in India's interest for poverty reduction, economic growth and sustainable development within the framework of resource security. A strong, vibrant and evolving extractives strategy that works to incentivize global best practices, supported with a legal framework that has its roots in resource security, sustainable development and intergenerational equity is a need of the hour.

The Indian mineral scenario: The Indian mining scenario consists predominantly of small mines. 56% of major mineral mines are below 10 hectares, and in most cases are not based adequately on scientific exploration. Minor minerals are generally extracted in even smaller leases. Clearly the legislative framework must allow, in fact facilitate and strongly incentivize, amalgamation and transfers so as to enable consolidation atleast of the major mineral extraction on geoscientific principles of contiguity, which can better address the issues of sustainability. The regulatory framework must also firmly disincentivise some of the suboptimal and unscientific practices which detract from sustainability . The MMDR (Amendment) Act, 2015 takes a step forward by enabling the State to determine the mine size for the auction

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process in future and by allowing transfers of auctioned mines, but that does not fully address the current problems where most of the small mines are non-auctioned. Of course, the problem may disappear after 2020 when non-captive leases mandatorily terminate .

Issues of resource efficiency and resource security in mining: One of the major concerns in Indian mining is the extraction efficiency of mineral resources. The National Mineral Policy 2008 advocates “zero-waste” mining. This includes not only the extraction of lower grade ores but also of “minor metals” which are metals that occur along with main metal of interest (e.g iron or aluminium or copper, lead , zinc etc) in small quantities. Emphasis needs to be given to co-production of by-product metals from base metal ores through process R&D so that the country’s needs of so-called Technology Metals and Energy Critical Metals are effectively met, and provide raw material security on the one hand and competitive edge on the other, for the country’s manufacturing sector. Bidding systems under the MMDR (Amendment) Act, 2015 will need to address this squarely by ensuring that they are factored into resource estimations and valuations (and of course, into the Mining Plan).

“Exploring in India” for “Making in India”: The determination by IBM of national priorities for exploration, as contemplated in para 11.2 of the National Mineral Exploration Policy 2016(NMEP), needs to include assessments with regard to India’s medium term mineral security . In particular, emphasis needs to be given to co-production of by-product metals from base metal ores through process R&D so that the country’s needs of so-called Technology Metals and Energy Critical Metals are effectively met, and provide raw material security on the one hand and competitive edge on the other for the country’s manufacturing sector. Creation of a venture-capital funded process R&D setup is clearly required to extract metals of strategic value which occur in small concentrations.

Where the feasibility of a mineral deposit is the question, process R&D to conduct feasibility studies often constitutes a high-risk high-reward situation. Creation of a venture-capital funded process R&D setup is clearly required if the concept of zero waste mining is to be taken to its logical conclusion. Incentives, fiscal as well as non-fiscal, need to be structured based on a detailed study of how the system works in countries such as Australia and Canada, in particular Australia’s Cooperative Research Centre (CRC) mechanism which supports end-user driven research collaboration.

Introduction of the “Large Area Prospecting Licence(LAPL) specifically for minerals other than iron ore, bauxite , limestone etc (bulk or surfacial minerals) and for deep exploration , and providing a separate channel that allows the LAPL concessionaire to claim assured and direct mining rights (including transferability thereof) is necessary in the interest of extraction efficiency and resource security. This alone will ensure that private sector investments flow

into exploration along with new and advanced technology to locate deep-located and concealed minerals vital for India's economic growth and development.

Mining within a Sustainable Development Framework(SDF): The Sustainable Development Framework 2011 (SDF) for the mining sector with appropriate compensation to those affected by mining related operations is an important feature of the National Mineral Policy 2008 which finds a mention in the MMDR Act after its amendment. The first level SDF Document already published is intended to be the guiding instrument that will fill gaps in addressing concerns for the well-being and socio-economic development of affected populations and also ensure that there is adequate and effective community engagement at all stages. The second and third level of documentation respectively at State and District level under the SDF is essential to ensure that laws relating to the environment and other natural resources like forest and land work in harmony with mining laws and balance the social and environmental issues with those relating to the exploitation of mineral resources for economic growth and poverty reduction. The SDF framework needs to be fully aligned with the Sustainable Development Goals(SDGs) which are a subsequent development.

The SDF framework is developed keeping in view the approach of the International Council for Metals and Mining(ICMM) and incorporates the following 7 principles:

- Incorporate environmental and social sensitivities in decisions on leases
- Undertake strategic assessment of key Mining Regions at periodic intervals
- Manage impacts at the mine level through sound management systems
- Address land, R&R and other social impacts upfront
- Promote community engagement, benefit sharing and contribution to socio-economic development
- Ensure orderly mine closure planning and implementation and post-closure activities; and
- Put in place systems for assurance and credible reporting.

Sustainable Development Goals (SDGs)

The mining industry impacts positively and negatively across the SDGs, and the nature and quantum of the impact depends on mining practices. Mining can foster economic development by providing opportunities for decent employment, manufacturing, increased fiscal revenues, and infrastructure linkages. Many of the minerals produced by mining are also essential for many technologies (notably electronics), infrastructure creation, energy and agriculture production. Historically, however, mining has contributed to many of the challenges that the

SDGs are trying to address – environmental degradation, displacement of populations, worsening economic and social inequality, armed conflicts, gender-based violence, corruption, increased risk for many health problems, and the violation of human rights.

The Core SDG for Mining is SDG 12: **Ensure sustainable consumption and production patterns**: The goal includes the following targets which are particularly relevant for mining:

- 12.1 Implement the 10-Year Framework of Programmes on **Sustainable Consumption and Production Patterns**
- 12.2 achieve the **sustainable management and efficient use** of natural resources
- 12.4 achieve the **environmentally sound management** of chemicals and all wastes throughout their life cycle,
- 12.5 substantially **reduce waste generation** through prevention, reduction, recycling and reuse
- 12.6 Encourage companies, especially large and transnational companies, to adopt **sustainable practices** and to **integrate sustainability information into their reporting cycle**
- 12.8 ensure that people everywhere have the relevant information and awareness for **sustainable development** and lifestyles in harmony with nature
- 12.a Support developing countries to **strengthen their scientific and technological capacity** to move towards more sustainable patterns of consumption and production

The SDGs are of course integrated and indivisible and are to be comprehensively viewed in the three dimensions: the “economic”, “environmental” and “social” dimensions. In that perspective, quite a number of the SDGs have a relevance to and are impacted by mining related activities. To illustrate:

SDGs on Economic Development: Mining can have a local, regional and national impact on economic development and growth that can be leveraged to build new infrastructure, new technologies and workforce opportunities. In major mining nations, it can function as an engine of growth. SDGs with economic implications for mining include:

- **SDG 2- Food security , improved nutrition and Sustainable agriculture:** Mining , can adversely impact availability of land and quality of soil for agriculture, affecting its sustainability and ability to ensure food and nutritional security. Post-Mine Closure planning can mitigate adverse impacts and even improve overall outcomes. Mining can also ensure production of phosphates and other “fertilizer minerals” necessary for agriculture
- **SDG8 – Decent Work and Economic Growth:** Mining can generate new economic opportunities for citizens and members of local communities, including jobs, training,

and business development relating to mining operations, associated service providers, or new local economies linked to the mine.

- **SDG9 – Infrastructure, Innovation and Industrialization and SDG12 – Responsible Consumption and Production:** Mining can help drive economic development and diversification through direct and indirect economic benefits and by spurring the construction of new infrastructure for transport, communications, water and energy. Mining also provides materials critical for renewable technologies and the opportunity for companies to collaborate across the supply chain to minimize waste, and to reuse and recycle.

SDGs on Environmental Sustainability: Mining activities typically cause impacts on the resource base and quality of land, water, the climate and the flora, fauna and people. Relevant SDGs include:

- **SDG6 – Clean Water and Sanitation, SDG 14: life under water; and SDG15 – Life on Land:** Mine development requires access to land and water, presenting significant adverse impacts on land and soils, aquatic systems, water quantity and quality, air quality (dust, GHGs etc), floral and faunal biodiversity and ecological processes that can be *mitigated or avoided to some extent if efforts are made*.
- **SDG7 – Energy Access and Sustainability and SDG13 – Climate Action:** Mining activities are energy and emissions intensive; mining therefore adversely impacts the relevant SDGs; however mining enables the use of Technology Metals, Energy Critical Metals and Rare Earth Metals which have applications in energy efficiency and renewable energy generation presenting opportunities for greater efficiency as well as expanding access to energy. There is also scope for reduction in emissions and increased energy efficiency (and green energy) in mining operations.

SDGs on Social inclusion, equity and Justice: Mining significantly impacts local communities; on the one hand bringing economic opportunities including employment, livelihoods and growth opportunities; but also challenges relating to reduction in availability and quality of local livelihood resource base and adverse impact on human rights and quality of life :

- – **SDG1 – End Poverty, SDG5 – Gender Equality and SDG10 – Reduced Inequalities:** Mining generates significant revenues through taxes, royalties and dividends for governments to invest in economic and social development, in addition to opportunities for jobs and business locally. Mining companies can take an inclusive approach by working with communities to understand the mines' actual and potential positive and negative impacts. Companies can also support participatory local decision-making processes regarding the mining operations, the equitable allocation of benefits and the resolution of grievances, and identify and expand opportunities to strengthen the voice

and influence of marginalized groups, including women, to ensure that inequalities are reduced, rather than reinforced, by the economic opportunities a mine may bring.

- **SDG 11- Inclusive, safe, resilient and sustainable cities and human settlements:** Mining provides the building materials necessary for the growth of cities and human settlements; the metals help provide the infrastructure and supporting services including energy and transportation. Modern materials , many of them based on metals improve resilience and adaptive capacity .
- **SDG16 – Peace, Justice and Strong Institutions:** Mining is often seen as increasing social conflict because of the perceived asymmetry of distribution of benefits from the extractive industry. Mining Industry can contribute to more peaceful societies and the rule of law by preventing and remedying company-community conflict, respecting human rights and the rights of vulnerable peoples, avoiding illicit transfers of funds to public officials or other persons, ensuring transparent reporting of revenue flows, and supporting the representative decision-making of citizens and communities in extractives development.

Mining and Corporate Social Responsibility: In recent decades, the extractive industry has made significant advances in mitigating and managing mining-related negative impacts and risks, by improving how companies manage their environmental and social impacts, protect the health of their workers, achieve energy efficiencies, report on financial flows, and respect and support human rights. It is now clearly understood that it is possible, desirable and even profitable to reduce environmental impact of mining by greening the global primary metal sector. This will require incorporating “sustainable development “ principles in all phases, at mine level, regional level and “cumulative impact” level; incentivising the use of best available technology (BAT) in Mining Plans for improving resource and energy use-efficiency and for reducing waste and incentivising private investment Process R&D using venture capital.

Mining related activities need to be closely integrated with the economy at multiple levels, including aligning exploration and mining to maximise long-term efficient mineral production; increasing the efficiency of interface between mineral extraction and metal production to increase potential for manufacturing and jobs, as well as resource use efficiency; and promoting and incentivising investments in R&D, scientific HR and in skilling ,with rational segmentation between public and private investments.

As part of their Corporate Social Responsibility, Mining companies need to invest in improving social outcomes by increasing transparency of their operations; by institutionalising systematic public reporting at all stages within a more sustainable developmental framework ; by

partnering with local communities for skilling and improving prospects for employment and entrepreneurship; and by consulting local communities during mine planning and post-closure planning and aligning post closure land use with community aspirations. They also need to align with local governments in ensuring local area development including sustainable management of the natural resource base and infrastructure provisioning.
