



**Discussion Paper for Regional Consultations on the
Implementation of the United Nations Environment Assembly
Resolution on Mineral Resource Governance (UNEP/EA.4/Res. 19)**

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INTRODUCTION

The fourth session of the United Nations Environment Assembly (UNEA-4), held in Nairobi, Kenya, from 11-15 March 2019 adopted the UNEA Resolution No. UNEP/EA.4/Res. 19 on Mineral Resource Governance. The resolution recognizes the important contribution of mining towards the achievement of the Sustainable Development Goals (SDGs), the dependence of low-carbon clean technologies on metals and minerals and the critical role that governance plays in ensuring positive outcomes from mineral development.

The UNEA-4 resolution on Mineral Resource Governance:¹

1. *Recognizes* the findings of the International Resource Panel related to the sustainable management of metal and mineral resources and the need for further action, as well as the findings of the United Nations Environment Programme on mine tailings storage and those of the United Nations Environment Programme and its Global Resource Information Database (GRID)-Geneva on sustainable sand management;
2. *Also recognizes* that sustainable management of metal and mineral resources contributes significantly to the achievement of the Sustainable Development Goals;
3. *Underlines* the need to share knowledge and experience with regard to regulatory approaches, implementation practices, technologies and strategies for the sustainable management of metal and mineral resources, including over the whole life of the mine and the post-mining stage;
4. *Requests* the Executive Director of the United Nations Environment Programme, on the basis of reports such as those prepared by the International Resource Panel and United Nations Environment Programme-GRID, to collect information on sustainable practices, identify knowledge gaps and options for implementation strategies, and undertake an overview of existing assessments of different governance initiatives and approaches relating to sustainable management of metal and mineral resources, and report thereon to the United Nations Environment Assembly at its fifth session;
5. *Encourages* governments, businesses, non-governmental organizations, academia and international institutions, within their different areas of competence, to promote:
 - (a) Awareness of how the extractive industries can contribute to the sustainable development of countries and the well-being of their populations, as well as of the possible negative impacts on human health and the environment when these activities are not properly managed;
 - (b) Due diligence best practice along the supply chain, addressing broad-based environmental, human-rights-, labour- and conflict-related risks in mining, including the

¹ The full resolution including the preamble paragraphs can be found here: <https://bit.ly/3apGrcX>

continuing increase in transparency and the fight against corruption, with the support of the Extractive Industries Transparency Initiative, implementation and monitoring of existing environmental standards, and accountability;

- (c) Capacity-building mechanisms for the sustainable management of metal and mineral resources, including the management of major hazards, as well as to address mine closure requirements and the remediation of contaminated sites, including abandoned mines;
- (d) Public-private partnerships to promote sustainable management of metal and mineral resources;
- (e) Research, development and technological innovations to sustainably manage metal and mineral resources;
- (f) Sustainable mining and sourcing of raw materials in order to move towards decoupling economic growth from environmental degradation through approaches including but not limited to resource efficiency and the circular economy;
- (g) A reduction of the impacts associated with the materials needed for the transition to an innovative and environmentally friendly economy.

This discussion paper is prepared to support regional consultations held on the implementation of the resolution. The consultations aim to obtain feedback on the governance of extractive industries, understand the political landscape as well as regional needs. More specifically, and as requested by the UNEA-4 resolution, the consultations will also help identify best practices and knowledge gaps, assess governance options; and consider common elements of interest for next steps.

The discussion paper summarises global trends in minerals² and sustainable development and presents key findings from recent studies of mineral governance³ developed by UNEP and others. Options for the governance of minerals and lessons from best practices are also discussed. Questions are posed for consideration during consultations and future action on the topic. Findings from the regional consultations will feed into the report on the implementation of the resolution, which will be presented to the UNEA at its fifth session in February 2021.

² Following the Committee for Mineral Reserves International Reporting Standards (CRIRSCO) this paper adopts the definition of minerals as “any substance, extracted for value, occurring naturally in or on the Earth, in or under water or in tailings, residues or stockpiles, having been formed by or subjected to a geological process but excludes, water, oil and gas.” CRIRSCO. (2019). International Reporting Template for the Public Reporting of Exploration Targets, Exploration Results, Mineral Resources and Mineral Reserves. November.

³ Governance is defined to include: “the sum of laws, norms, policies and institutions that define, constitute, and mediate trans-border relations between states, cultures, citizens, intergovernmental and non-governmental organizations, and the market. It embraces the totality of institutions, policies, rules, practices, norms, procedures and initiatives by which states and their citizens (indeed humanity as a whole) try to bring more predictability, stability, and order to their responses to transnational challenges – such as climate change and environmental degradation, nuclear proliferation, and terrorism – which go beyond the capacity of a single nation state to solve.” United Nations Intellectual History Project (2009). The UN’s Role in Global Governance. Briefing Note No 15. Ralph Bunche Institute for International Studies. The CUNY Graduate Center.

GLOBAL TRENDS IN MINERALS AND SUSTAINABLE DEVELOPMENT

Minerals underpin global development and are critical to the achievement of the United Nations Agenda 2030 and the Sustainable Development Goals (SDGs),⁴ whether it be the copper that wires communication, the clay bricks and roof tiles that provide shelter, the mineral fertilisers fundamental for agriculture, the lithium and cobalt fueling the global transition to renewable energy, the garnet that filters water, or the gravel and stone that builds bridges and paves roads.

The extraction, processing, value-addition and use of mineral commodities continues to be characterized by significant environmental, social and economic challenges.⁵ Nearly twenty years have passed since the Global Mining Initiative, led by the International Institute for Environment and Development and the World Business Council for Sustainable Development released the results of a two-year global dialogue on Mining, Minerals and Sustainable Development (MMSD), titled *Breaking New Ground*. The initiative, signaled a shift by the formal mining sector in its approach to sustainable development.⁶ Since then, progress has been made on some issues, for some actors, in some places, but much remains to be done before mineral production is consistent with societal expectations, acceptable social and environmental standards and global ecological limits.⁷

Global consumption is driving increased demand for minerals. Mineral exploitation has grown markedly over the past century with production of minerals and metals (including mineral fuels and cement) estimated at 65 billion tonnes per annum.⁸ Improved resource efficiency and the decoupling of resource use from economic growth and environmental impacts is needed, to address the current unsustainable production of mineral resources. In the absence of a significant shift in the mineral intensity of the global economy, achievement of the SDGs will require a substantial amount of mineral resources. Stark increases in the efficiency of resource use, and steep progress toward a circular economy and the use of secondary raw materials are needed to meet both the equity and environmental goals of sustainable development. Consumption is driving the metals

⁴ IRP (2020). *Mineral Resource Governance in the 21st Century: Gearing extractive industries towards sustainable development*. Ayuk, E. T., Pedro, A. M., Ekins, P., Gatune, J., Milligan, B., Oberle B., Christmann, P., Ali, S., Kumar, S. V., Bringezu, S., Acquatella, J., Bernaudat, L., Bodourogrou, C., Brooks, S., Buergi Bonanomi, E., Clement, J., Collins, N., Davis, K., Davy, A., Dawkins, K., Dom, A., Eslamishoar, F., Franks, D., Hamor, T., Jensen, D., Lahiri-Dutt, K., Mancini, L., Nuss, P., Petersen, I., Sanders, A. R. D. A Report by the International Resource Panel. United Nations Environment Programme, Nairobi, Kenya.

. <https://bit.ly/32tN1fS>; Franks, Daniel M. (2020). Reclaiming the neglected minerals of development. *The Extractive Industries and Society*. <https://doi.org/10.1016/j.exis.2020.02.002>; CCSI, UNDP, UNSDSN, WEF (2016). Mapping Mining to the Sustainable Development Goals: An Atlas. July. <https://bit.ly/32sIED0>

⁵ The concept of externalities refers to the uncompensated environmental and social effects of production and consumption that fall outside of the market mechanism.

⁶ International Institute on Environment and Development (IIED) and World Business Council for Sustainable Development (WBCSD; 2002), *Breaking New Ground; Mining minerals and sustainable development*. The report of the MMSD project. London: Earthscan. <http://pubs.iied.org/9084IIED>

⁷ Responsible Mining Foundation (2020). RMI Report 2020. <https://bit.ly/32tDntL>; Franks, Daniel M. (2015). *Mountain movers: mining, sustainability and the agents of change*. London, United Kingdom: Earthscan. <https://doi.org/10.4324/9781315884400>

⁸ IRP (2020). *Mineral Resource Governance in the 21st Century*; Ekins, P, Gupta, J and Boileau, P. (Eds) (2019). *Global Environmental Outlook GEO-6: Healthy Planet, Healthy People*. Cambridge University Press. United Nations Environment. 708p. <https://bit.ly/2T0bpCL>

industry to expand into new domains (e.g. sea-bed mining; space mining; arctic mining), with governance of these domains lacking or still emerging.⁹

Climate change and the renewable energy transition are driving new demand for minerals. On the one hand, graphite (494%), lithium (488%) and cobalt (460%), are expected to experience significant production increases by 2050 to meet the demand created by renewable energy technologies.¹⁰ On the other hand, thermal coal mined for the production of electricity is experiencing structural change and price declines, as well as mine closures in some regions.¹¹ This energy shift is accompanied by new environmental and social challenges in the regions where these elements are located. Renewable energy is also becoming an important source of power for the large-scale metal mining industry and there is some evidence of emerging mitigation action by the large-scale metal mining industry to reduce emissions and strengthen climate resilience and adaptation.¹²

Urbanisation and infrastructure are creating substantial demand to supply aggregate (sand, gravel and crushed stone) for the construction and land reclamation sectors, driving environmental change particularly where sand and gravel are sourced from natural waterways.¹³ As much as 50 billion tonnes of aggregate are produced from quarries, rivers, lakes and the ocean each year.¹⁴ Little information is available on the nature of this extraction, and regulation and oversight of the sector is weak in many regions.¹⁵ Climate change and disaster reconstruction are creating additional demand for construction materials, while the quarry sector is not sufficiently considered or involved in disaster planning as evidenced by frequent aggregate and cement shortages in hurricane and cyclone reconstruction.¹⁶

Large-scale mineral extraction in much of the developing world remains an enclave economic activity with few linkages to local economies, thus missing opportunities to take advantage of

⁹ Ali, S., Giurco, D., Arndt, N. et al. (2017). Mineral supply for sustainable development requires resource governance. *Nature* 543, 367–372. <https://doi.org/10.1038/nature21359>

¹⁰ Hund, K., La Porta, D., Fabregas, T.P., Laing, T., and Drexhage, J. (2020). Minerals for Climate Action: The Mineral Intensity of the Clean Energy Transition. Washington, D.C., World Bank Group. <https://bit.ly/3dyYHCm>; Arrobas, D.P., Hund, K.L., McCormick, M.S., Ningthoujam, J., Drexhage, J.R. (2017). The Growing Role of Minerals and Metals for a Low Carbon Future. Washington, D.C., World Bank Group. <https://bit.ly/2TioAhf>; World Bank (2018). Mineral Demand Analysis of Energy Technologies Based on IEA ETP 2017 Scenarios. World Bank, September.

¹¹ Wamsted, D, and Schlissel, D (2019). Coal Outlook 2019. Institute for Energy Economics and Financial Analysis. March. <https://bit.ly/3ccuc5m>; International Energy Agency (2018). World Energy Outlook 2018. November.

¹² Maennling, N and Toledano, P (2018). The Renewable Power of the Mine: Accelerating renewable energy integration. Columbia Centre on Sustainable Investment, BMZ & GIZ, Energy and Mines. December. <https://bit.ly/2Tw2qsb>

¹³ Peduzzi, P (2014) P. Environ. Dev. 11, 208–218; United Nations Environment Programme (2019). Sand and Sustainability: Finding New Solutions for Environmental Governance of Global Sand Resources. <https://bit.ly/2uxyu6g>; Bendixen, M, Best, J, Hackney, C, and Lønsmann Iversen, L. (2019). Time is running out for sand. *Nature* 571, 29-31 <https://doi.org/10.1038/d41586-019-02042-4>; Franks, Daniel M. (2020). Reclaiming the neglected minerals of development.

¹⁴ O'Brien, J. (2019). Aggregates in growth mode. *International Cement Review*, June:46-51.

¹⁵ Franks, D.M. (2020). Reclaiming the neglected minerals of development; UNEP (2019). Sand and Sustainability.

¹⁶ Hailu, D., Ngonze, C. and Franks, D.M. (2019). Minerals in post-disaster reconstruction. United Nations Development Programme. <https://bit.ly/2wQS0LW>

multiplier effects and stimulate the larger economy for economic transformation.¹⁷ Further, the industrial and construction materials most needed for the development of domestic economies (infrastructure, agriculture and manufacturing) have received insufficient attention.¹⁸ The minerals sector, in particular artisanal and small-scale mining (ASM), is a large and under-recognised provider of employment and livelihoods in the developing world.¹⁹

The geopolitical dimension of raw-materials supply continues to be a focus for many countries.

More than 50 countries have set restrictions or duties on raw material exports,²⁰ while a number of importing countries have initiated programs to track the supply risks of critical minerals and have applied import restrictions to ensure responsible and conflict-free production practices. Investment in clean resource processing in the developing world as part of green industrialisation could simultaneously encourage domestic value addition, assist the diversity of mineral supply, and support the structural transformation of mineral endowed economies.

Ore grades (the concentration of the desired mineral within the rock) are in decline for many commodities, meaning that more waste is produced for each unit of metal produced.²¹

Global solid mineral waste production is estimated at 90 billion tonnes per year.²² Declining ore grades are placing significant pressure on the ability of the industry to safely manage tailings (the ground up waste rock left over after processing) and other mineral wastes. Common issues include the generation of acid and metaliferous drainage and geotechnical failure of tailings facilities. Evidence suggests that while the overall number of tailings facility failures has decreased, the number of serious failures has increased.²³ Recent examples of catastrophic failure of tailings facilities in Brazil, Australia and Canada are now driving reform in governance (including a new Global Tailings Standard) and transparency (Global Tailings Portal). The uptake of alternative safer tailings storage options, such as filtered tailings, has remained low indicating a lack of incentives for innovation and technology in tailings management. There is potential for tailings reprocessing to extract value and assist in the management and rehabilitation of mineral wastes.²⁴ Complex ore bodies mean that a

¹⁷ IRP (2020). Mineral Resource Governance in the 21st Century;

¹⁸ African Union. (2009). Africa Mining Vision. February. Addis Ababa; African Union. (2016). First AU Specialized Technical Committee on Trade, Industry and Minerals. 16th – 24th May 2016, Addis Ababa, Ethiopia. Report of Ministers, 23-24 May, 2016. Doc: AU/DTI/STC-TMI/Rpt.Min/FINAL; Franks, D.M. (2020). Reclaiming the neglected minerals of development;

¹⁹ World Bank. (2019). 2019 State of the Artisanal and Small-Scale Mining Sector. Washington, D.C.: World Bank.

²⁰ OECD. (2019). Methodological note to the Inventory of Export Restrictions on Industrial Raw Materials. <https://bit.ly/3cp0ZUh>.

²¹ Mudd, G. (2007). Global trends in gold mining: Towards quantifying environmental and resource sustainability. *Resources Policy* 32(1-2):42-56; Franks, DM, Boger, DV, Cote, CM, Mulligan, DR. 2011. Sustainable Development Principles for the Disposal of Mining and Mineral Processing Wastes. *Resources Policy*. 36 (2): 114-122.

²² This figure includes tailings and waste rock produced from mineral production excluding construction materials. Ekins, P, Gupta, J and Boileau, P. (Eds) (2019). *Global Environmental Outlook*.

²³ Bowker, L.N. and Chambers, D.M. (2016). Root Causes of Tailings Dam Overtopping: The Economics of Risk & Consequence. 2nd International Seminar on Dam Protection Against Overtopping. Ft. Collins, Colorado, USA, 7-9 September 2016

²⁴ Baker, E, Franks, D.M., Valenta R. (2020) Lessons from tailings facility data disclosures. Global Tailings Review Report. *Forthcoming*.

significant proportion of available future reserves feature environmental and social constraints to access.²⁵

Trust of the minerals sector by the general public is low, with nearly half of the mining company executives questioned in a recent business survey identifying social acceptance as their top business risk.²⁶ Recent tailings failures and other cases of unsafe working conditions, environmental harm, social conflict, and human rights violations (such as child and forced labour) have furthered distrust of industry-led reform initiatives, and fueled demands for multi-stakeholder governance, improved monitoring, stronger government oversight, and improved safeguards. Ethical investors have been active in pushing for reform of environmental, social and governance issues. Social license to operate²⁷ has become a commonplace concept, originating first in the large-scale minerals industry, but to the extent that issues are not, or cannot, be resolved by social pressure falls short as a framework for governing sustainable development issues.²⁸

Responsible production, conflict and supply security are the predominant thematic issues shaping supply chain due diligence approaches, while issues related to environment and development are under-emphasised. Supply-chain due-diligence and certification initiatives are providing market information for consumers to consider ethical alternatives, particularly in the jewelry industry. Due diligence approaches applicable to artisanal and small-scale miners are predominantly focused on international supply chains, overlooking the potential for integration of ASM into domestic supply chains and the production of minerals needed for domestic development.

Capacity has increased but is still lacking to effectively respond to environmental issues across large, medium, small and artisanal mining sectors. Some mining companies have strengthened commitments, and employed sustainability professionals responsible for performance, while many show little progress, with commitments commonly not translated into meaningful change on the ground.²⁹ Frameworks for water accounting, water recycling, and energy efficiency have been supported at the site-level and industry-wide. Government agencies with oversight responsibilities commonly do not have the human and technical capacity to effectively monitor and manage the

²⁵ Lèbre, E, Owen, JR, Corder, GD, Kemp, D, Stringer, M and Valenta RK (2019). Source risks as constraints to future metal supply. *Environmental Science & Technology* 53 (18), 10571-10579

²⁶ Mitchell, P, Downham, L and van Dinter, A. (2019) Top 10 business risks and opportunities – 2020. Ernst & Young Global. <https://go.ey.com/39jdqbi>

²⁷ Social license is metaphor used in the mining industry to refer to the necessity to gain “acceptance of mining activities by local communities and stakeholders” (IRP, 2020). The concept is distinct from a formal legal license. For further reading see Thomson, I. and Boutilier, R. (2011). The social Licence to operate. In SME Mining Engineering Handbook by P Darling (ed.), Society for Mining, Metallurgy and Exploration, Colorado; and Owen, John R. and Kemp, Deanna (2013). Social licence and mining: a critical perspective. *Resources Policy* 38 (1) 29-35. <https://doi.org/10.1016/j.resourpol.2012.06.016>

²⁸ IRP (2020). Mineral Resource Governance in the 21st Century; Owen, J.R. and Kemp, D. (2013). Social licence and mining: a critical perspective. *Resources Policy* 38 (1) 29-35. <https://doi.org/10.1016/j.resourpol.2012.06.016>

²⁹ Responsible Mining Foundation (2020). RMI Report 2020.

sector. Artisanal and small-scale mining voices and actors remain largely outside of the development and environment agenda, inhibiting further progress.

Indigenous Peoples and civil society who have voiced opposition to projects in some countries have become the target of violence, threats, arbitrary arrests and dispossession of their lands.³⁰ Positive trends are also evident with increasing prevalence of agreement-making between Indigenous Peoples and resource developers, including cases of substantial benefit sharing, involvement in environmental and cultural heritage management, employment, and business development. Increasing application of UN Declaration on Rights of Indigenous Peoples, ILO 169 and recognition of Indigenous land rights have supported these improvements. Opportunities remain to increase transparency and trust, such as co-development of plans, participatory monitoring, and participatory governance mechanisms.

Oversight of the mineral sector at the state level is mixed, but generally insufficient to ensure that the sector contributes positively to the SDGs and the Sendai Framework for Disaster Risk Reduction 2015-2030, and avoids harm to people and the environment.³¹ Governments have utilized tools such as environmental and social impact assessment, strategic assessment, participatory monitoring, inspections, certification, regional planning, and environmental bonds to understand impacts and ensure proper management. A poor governance environment has been demonstrated to detract responsible investors from jurisdictions and leave only those tolerant of a high-risk operating environment, simultaneously constraining the opportunities of development from minerals and exacerbating environmental and social problems.³²

³⁰ Tayler, L, Schulte, C, Rall, K (2019). Targeted: Counterterrorism Measures Take Aim at Environmental Activists. Human Rights Watch <https://bit.ly/39a3ms0>; Watts, J (2018). Almost four environmental defenders a week killed in 2017. The Guardian. <https://bit.ly/3aic9Jn>

³¹ IRP (2020). Mineral Resource Governance in the 21st Century.

³² Franks, DM, Davis, R, Bebbington, AJ, Ali, SH, Kemp, D, Scurrah, M. 2014. Conflict translates environmental and social risk into business costs, *Proceedings of the National Academy of Sciences*. 111(21): 7576-7581; Otto, James M. (1992), 'Criteria for assessing mineral investment conditions.' *Mineral Investment Conditions in Selected Countries of the Asia-Pacific Region*. ST/ESCAP/1197, United Nations, New York; Tole, L. and G. Koop (2011), 'Do environmental regulations affect the location decisions of multinational gold mining firms?' *Journal of Economic Geography*, 11(1), 151–177.

Questions for consultation:

- How are these trends playing out in your region?
- What are the main risks associated with the mining sector in your region and what has been the governance response to these risks?
- How can effective risk reduction measures be implemented?
- Do different people, countries and environments experience the above trends differently?
- What are the environmental, social and governance implications?
- What lessons can be learnt from for the governance of mineral resources?

FINDINGS AND RECOMMENDATIONS FROM RECENT REPORTS ON MINERAL GOVERNANCE

Mineral Resource Governance in the 21st Century: Gearing extractive industries towards sustainable development

International Resources Panel. United Nations Environment Programme (2020)

<https://bit.ly/32tN1fS>



Findings

- A plethora of domestic, regional and international legal and regulatory frameworks, as well as formal and informal initiatives and instruments exist, which are all aimed at improving governance of the extractive industry for increased economic prosperity and environmental protection.
- Some of the challenges with existing instruments include:
 - As instruments tend to respond to a particular challenge, many tend to be sectorial and narrow;
 - Risk management and security of supply still inform many of the instruments;
 - Compliance is expensive. Many instruments tend to be voluntary, which results in low compliance;
 - The piecemeal and narrow focus, plus a lack of coordination with other stakeholders, can lead to unintended consequences; and
 - Voluntary instruments may undermine the regulatory role of governments by claiming self-regulation is more effective.
- In general, most existing policy frameworks and instruments governing the mining sector represent piecemeal efforts and, importantly, often fail to be implemented at the national level. Collectively they have failed to bring about a transition away from the 'extractivist' and anthropocentric model prevalent in the developing world, whereby the extractive sector is an enclave with few linkages to the local economy.

Recommendations

- Policy-makers should formulate and define a holistic multi-level governance framework for the extractive sector – referred to as a “Sustainable Development Licence to Operate (SDLO)” – including consensus-based *principles, policy options* and *best practices* that are compatible with the SDGs and targets, and with relevant priorities, obligations and standards at local, national and international scales. The SDLO is not designed to function as a licence in the compulsory sense. It instead extends the widely used Social Licence to Operate (SLO) concept so that it can function as a normative reference point oriented towards the achievement of sustainable development. Decision-makers can undertake SDLO gap analysis and governance reform with a view to formulating nationally and/or organisation-specific pathways to implementation of the SDLO, including through updating and adapting existing visions, policies, strategies, laws, regulations and practices.
- Benchmarking of the 80+ existing standards and instruments, as well as corporate and industry policies, national, sub-national and local laws and regulations against the SDLO framework, the SDGs, and each other. The relevant principals should jointly explore the opportunities for harmonization of global standards and consolidation of existing initiatives and instruments for ease of application, improved efficiency, greater enforcement and less duplication or redundancies.
- International dialogue to consider options for new agreements to strengthen transnational governance of mining including mechanisms to foster transparency and quadruple bottom-line accountability; to address illicit financial flows, price volatility and security of mineral supply; and generate shared value to host and home nations in a way that is compatible with sustainable development.
- Creating, empowering and capacitating national, sub-national and local institutions concerned with i) surveys and assessments of mineral resources; ii) management of the resources; iii) regulation of their exploration and extraction and iv) management and regulation of the social and environmental impacts.
- UNEA, the IGF and wider UN processes, could serve as fora for negotiation of an international consensus regarding both the normative content and structure of the SDLO, as well as specific policy options and programmes for its implementation.
- Creation of an International Minerals Agency, or the signing of an international agreement, to, inter alia, coordinate and share data on economic geology, mineral demand needs, and promote transparency on

Mine Tailings Storage: Safety Is No Accident: A UNEP Rapid Response Assessment

United Nations Environment Programme and GRID-Arendal (2017)

<https://go.aws/2PtLI0w>

Findings

- Examined the human and environmental costs of continued tailings dam disasters, assessed why tailings dam failures occur and suggested policy actions aimed at catalysing the change needed to ensure tailings dam safety.
- Found that issues are serious enough to warrant more detailed consideration and action by regulators, financiers, owners and operators of mines.



Recommendations

1. The approach to tailings storage facilities must place safety first by making environmental and human safety a priority in management actions and on-the-ground operations. Regulators, industry and communities should adopt a shared zero-failure objective to tailings storage facilities where “safety attributes should be evaluated separately from economic considerations, and cost should not be the determining factor” (Recommendation adopted from Mount Polley expert panel, 2015, p. 125)
2. Establish a UN Environment Programme stakeholder forum to facilitate international strengthening of tailings dam regulation.

Action 1. Facilitate international cooperation on mining regulation and the safe storage of mine tailings through a knowledge hub

- (a) Create and fund an accessible public-interest, global database of mine sites, tailings storage facilities and research.
- (b) Fund research into mine tailings storage failures and management of active, inactive and abandoned mine sites.
- (c) Compile and review existing regulations and best practice guidance.

Action 2. Failure prevention

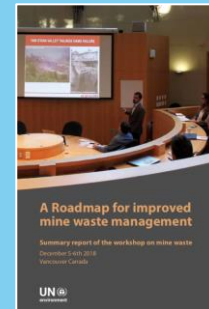
- (d) Expand mining regulations, including tailings storage, independent monitoring and the enforcement of financial and criminal sanctions for non-compliance.
- (e) Regularly publish disaster management plans that relate to local and regional circumstances and planning.
- (f) Increase gender diversity on company boards, and include local representatives and skill sets focusing on community engagement, ethics, social and environmental impact.
- (g) Establish independent waste-review boards to conduct and publish independent technical reviews prior to, during construction or modification and throughout tailings storage-facility lifespan.
- (h) Avoid dam construction methods known to be high risk.
- (i) Ensure any project assessment or expansion publishes all externalized costs, with an independent life-of-mine sustainability cost-benefit analysis.
- (j) Require detailed and ongoing evaluations of potential failure modes, residual risks and perpetual management costs of tailings storage facilities.
- (k) Enforce mandatory financial securities for life of the mine (includes post-closure).
- (l) Ban or commit to not use riverine tailings disposal. Adopt a presumption against the use of submarine tailings disposal, water covers on tailings dams and the use of upstream and cascading tailings dams unless justified by independent review.

A Roadmap for Improved Mine Waste Management: Summary report of the workshop on mine waste

United Nations Environment Programme, CIRDI and GRID Arendal (2019)
<https://go.aws/2PsyCeE>

Findings

- Mining companies, communities and governments recognize that mine waste can damage the environment and impact lives and livelihoods.
- Despite many good intentions and investments in improved practice, large tailings storage facilities, built to contain mine tailings can leak or collapse.
- When such events occur, they can destroy entire communities and livelihoods and remain one of the biggest environmental threats related to mining.
- Tailings incidents may become more frequent due to the effects of climate change, as extreme weather events become increasingly commonplace. There is also a trend to larger facilities that can increase the impacts if a failure event occurs.
- The mining industry has acknowledged that preventing catastrophic tailings dam incidents with zero fatalities and environmental protection is fundamental and achievable.



Recommendations

- Expand the definition of failure beyond “a release of tailings” to include other failures: failure to prevent and manage environmental risks, failure to communicate risk to local communities, failure to plan for accidents, failure to plan for adequate mine closure, failure to consider future generations and failure to look for innovative solutions to the current problems associated with mine waste.
- Adopt a long-term goal of net zero mine waste and new and transformational mining activity.
- Require compulsory competent external review of waste management facilities.
- Address legacy waste inclusive of re-use opportunities for these materials.
- Develop and convene interested parties to continue discussions.
- Develop awareness raising products that support active knowledge transfer, including webpages and articles, networking, development of champions, muster support from ICMM, and other intergovernmental and national mining industry bodies.
- Develop of a global standard for mine waste management, start by documenting available standards and suggest modification and amalgamation.
- Develop a global convention on mining and research limitations and successes of other global conventions.
- Research options for economic incentives to encourage mining companies to improve management and adopt minimum standards.
- Expand voluntary ethical minerals initiatives to minerals across the whole global value chain.
- Develop a market for different types of mine waste, for example, construction companies, and provide enabling incentives to encourage research in to the use of mine waste and the reduction in mine waste (zero mine waste).
- Establish an accessible global data base of mine sites, tailings dams and research priorities.

Implementation

- Implementation of the above recommendations proceeded in 2019/2020 with a public request for disclosure of tailings storage facilities sent to companies (Investor Mining and Tailings Safety Initiative); compilation of the disclosed data into a global database on mine tailings facilities (Investor Mining and Tailings Safety Initiative, GRID-Arendal and UNEP) and development of a Global Tailings Standard (UNEP, Principles on Responsible Investment and International Council on Mining and Metals).

Sand and sustainability: Finding new solutions for environmental governance of global sand resources

GRID-Geneva and United Nations Environment Programme (2019)

<https://bit.ly/2uxyu6g>



Findings

- The needs and expectations of our societies are driving the demand for sand resources but a continued responsible supply cannot be assumed without improved governance of global sand resources.
- The scale of the challenge inherent in sand and gravel extraction makes it one of the major sustainability challenges of the 21st century. These materials are one of the largest resources extracted and traded by volume, yet it is one of the least regulated activities in many regions.
- Current legal frameworks are not sufficient considering the global outlook on aggregates demand and production.
- Without an integrated view on the governance, planning and management of these resources, sand extraction risks falling between the cracks into informal, or even illegal practices.
- There is a lack of adequate information on sand extraction. We do not understand sand production and transport systems well in the context of current day geological and hydrological processes. Sand and gravel are a challenge to trace to their sources.
- The sand industry is fragmented and significantly informal in some parts of the world. Identifying existing sand extraction and trading companies requires peeling back many layers in a complex value chain– particularly in emerging economies.

Recommendations

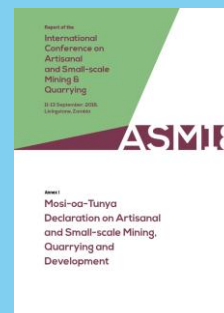
- Utilise existing solutions to prevent or reduce damage to river, beach and marine ecosystems and social risks to workers and communities in sand extraction sites:
 - Avoiding consumption through reducing over-building and over-design
 - Using recycled and alternative materials to sand in the construction sector
 - Reducing impacts through implementing existing standards and best practices.
- Customise existing standards and best practices to national circumstances and extend where necessary to curb irresponsible and illegal extraction.
- Reconcile globally-relevant policies and standards with the local realities of domestic sand resource availability, local development imperatives and standards and enforcement realities.
- Invest in sand production and consumption measurement, monitoring and planning.
- Establish dialogue between key players and stakeholders in the sand value chain based on transparency and accountability.
- Build consensus through improved coordination and public awareness-raising at the global, regional and national levels on how much our current development trajectory is dependent on sand supply and the sustainability challenges this poses.

Mosi-oo-Tunya Declaration on Artisanal and Small-scale Mining, Quarrying and Development

International Conference on Artisanal and Small-scale Mining & Quarrying, 11-13 September 2018;
ACP Group of States, UNDP, EU, Government of Zambia and others
<https://bit.ly/2watoNN>

Findings

- Five-hundred and forty-seven delegates, representing 72 nations assembled to chart a vision for sustainable development, the largest international gathering of artisanal, small-scale miners and quarry workers ever assembled and the first international conference on ASM in nearly a decade.
- An historic outcome was the adoption of the 'Mosi-oo-Tunya Declaration.' The declaration built on earlier ASM conference declarations such as the 'International Seminar on Guidelines for Development of Small- and Medium-scale Mining' from Harare (1993), the 'International Roundtable on Artisanal Mining', Washington (1996), and the 'Seminar on Artisanal and Small-scale Mining in Africa', Yaoundé (2002) as well as key policy and guidance texts.
- Found that only with the involvement of artisanal and small-scale miners in governance will the sustainable development challenges associated with ASM be effectively resolved.



Recommendations

- Affirm that artisanal and small-scale miners and quarry workers must be at the heart of any efforts to transform ASM and call on all stakeholders to recognise the initiative and leadership demonstrated by miners and their representatives; actively listen to all issues, concerns and suggestions raised and seek to understand on the ground realities; eliminate any language, discourse and behaviour that worsens the stigma associated with ASM; and act in a way that empowers miners to chart their own vision of development.
- Acknowledge the need for sustained commitment to ASM development, and call upon governments, private sector, multi-lateral institutions, financial institutions and development cooperation to reflect the importance of ASM in international, regional, national and local development agendas, policies, and plans and for governments to raise this importance with financing and technical partners.
- Urge all stakeholders to find a common ground on how to streamline governance and support for ASM, and emphasise the need for representation and support of miners by their own organisations.
- Request international development cooperation and governments to invest in capacity building on enterprise skills, market analysis, investment promotion, technology, geological skills, mine and quarry management, environment, health and safety, community relations and grievance handling, labour rights, and other practical skills that will empower ASM.
- Urge governments to strengthen effective oversight and ASM compatible regulation for environmental protection; and all other stakeholders to play their part in safeguarding the integrity of ecosystems for future generations.
- Emphasise that informality along the whole supply chain impedes the sustainable development of ASM and call on the private sector and relevant stakeholders along the supply chain to work together for a formalized, profitable, inclusive and responsible sector and for governments to put in place an enabling business operating environment.

Questions for consultation:

General

- What resources, skills, capabilities and decisions are required to implement the above recommendations? What alternatives or amendments would you suggest?
- How can the implementation and enforcement of existing legal instruments, as well as voluntary commitments be strengthened?
- How can transboundary cooperation (within, and across different regions) be improved?)

Specific to the reports

- How useful do you find 'sustainable development license to operate' as a framework to guide minerals development?
- Should countries work towards zero wet tailings impoundment and tailings re-use? If so, how?
- Should national mineral laws include:
 - An emphasis on reducing the amount of tailings produced from current operations to reduce mine waste and the need for tailings storage facilities
 - A goal of developing new projects with tailings elimination in mind from the beginning of the project's lifecycle
- How should government and industry approach the management of decommissioned or abandoned tailings storage facilities, in particular those most at risk of collapse?
- Should national mineral laws include financial assurance of tailings storage facilities to protect countries from any financial incapacity of the operator or bankruptcy? What kind of financial instruments would best serve this purpose?
- How is sand extraction and use regulated in your jurisdiction?

OPTIONS FOR THE GOVERNANCE OF MINERAL RESOURCES

The governance landscape of mining is diverse. The mineral sector consists of a wide range of commodities from metals, energy minerals and gemstones, to construction materials and industrial minerals. These are all produced by a diverse range of actors, from diversified multi-national mining companies, to commodity-specific mid-tier companies, state-owned companies, mid-sized and small quarry companies, exploration and producing juniors, artisanal and small-scale miners.

Similarly, the forms of regulation³³ that shape the governance of minerals are also diverse, and include: international legal instruments, international standards, domestic law and regulation, industry standards, corporate standards and policies, multi-stakeholder and civil-society led initiatives, conditions of finance and shareholder activism, social pressure, institutional and individual capacity building (see Table 1 and Table 2). Each location where minerals are mined represents a unique geographical and political setting, whose outcomes are shaped by a wide range of influences.

As mentioned earlier in this paper, almost two decades ago, the MMSD published *Breaking New Ground*, which outlined an agenda for change in the minerals industry. Simultaneously, the International Council on Mining and Metals (ICMM) was established as the peak industry body mandated with implementing the agenda. The MMSD identified governance as one of nine key challenges:

Sector Governance: Roles, Responsibilities, and Instruments for Change. Sustainable development requires new integrated systems of governance. Most countries still lack the framework for turning minerals investment into sustainable development: these need to be developed. Voluntary codes and guidelines, stakeholder processes, and other systems for promoting better practice in areas where government is unable to exercise an effective role as regulator are gaining favour as an expedient to address these problems. Lenders and other financial institutions can play a pivotal role in driving better practice.³⁴

Since this time, a number of the MMSD's recommendations (see Table 3) have been implemented/adopted, even while many of the challenges identified by *Breaking New Ground* remain unresolved. Progress on the recommendations includes:

- corporate policies and management systems have been developed for a wide number of companies;
- the ICMM has adopted a Sustainable Development Framework to implement its principles;
- project level grievance-handling and dispute resolution mechanisms have been implemented across a number of companies;

³³ The term regulation is used here in the broadest sense to refer to the means by which social behaviours are influenced and controlled, rather than the more specific meaning as the promulgation of rules to enforce laws. See Koop C., and Lodge, M. (2017). What is regulation? An interdisciplinary analysis. *Regulation and Governance* 11(1):95-108. <https://doi.org/10.1111/rego.12094>

³⁴ IIED and WBCSD (2002), *Breaking New Ground*. p.xviii.

- the adoption of the principle of free, prior and informed consent from Indigenous peoples into industry standards;
- wider use of agreement-making with affected communities and Indigenous peoples;
- the establishment of a global register of all payments by mining companies to governments;
- harmonisation of corporate reporting requirements through the Global Reporting Initiative;
- action on protected areas with the International Union for Conservation of Nature.³⁵

When comparing the mineral governance landscape of today with that of twenty years ago, one major difference is the large number of voluntary international and industry standards for sustainable development that have been created. While these standards and frameworks have disseminated new norms and strengthened the oversight of the sector, their influence is not as deep, into the body of the industry, or as wide, across the diversity of entities that make up mining, as is necessary for truly transformative change. The sheer number of schemes is also creating ‘initiative fatigue.’³⁶ Furthermore, each initiative tends to respond to a particular challenge, or part of the sector and while their voluntary nature has aided in uptake, collectively they lack enforcement and can have the effect of undermining the regulatory role of governments.³⁷ One study of the effectiveness of 15 schemes found that 40% of the schemes did not define minimum requirements of compliance or establish consequences and sanctions for situations of non-compliance, while only 20% of the schemes had a mechanism for periodic evaluation of the scheme’s effectiveness.³⁸ Anticipating this trend *Breaking New Ground* warned:

Efforts are needed to avoid the proliferation of competing schemes – norms, standards, guidelines, and criteria for the minerals sectors. To achieve this, effective and trusted systems of stakeholder engagement are required. These need to ensure that those with most at stake, especially the most vulnerable groups, are able to participate in appropriate and effective ways.³⁹

The uptake of voluntary sustainability initiatives has been aided by both the absence of state-level policy and regulation, and its presence, where such regulation requires adherence to international standards.⁴⁰

Governments have faced challenges in regulating the mining industry. Pressure to maintain an ‘attractive investment climate,’ in some jurisdictions has meant reducing environmental and social obligations on mineral developers. Corruption has also played a role in undermining the state’s

³⁵ Franks (2015), *Mountain Movers*.

³⁶ World Economic Forum & Resolve (2015). Voluntary Responsible Mining Initiatives: A Review. <https://bit.ly/2x20hwE>

³⁷ IRP (2020). Mineral Resource Governance in the 21st Century.

³⁸ Mori Junior, R. Franks, DM and Ali, S.H. (2015). Designing Sustainability Certification for Greater Impact: An analysis of the design characteristics of 15 sustainability certification schemes in the mining industry. June. 53p. <https://bit.ly/2TcGnre>

³⁹ IIED and WBCSD (2002), *Breaking New Ground*. p.xxiii.

⁴⁰ Potts, J, Wenban-Smith, M, Turley, L and Lynch, M. (2018). State of Sustainability Initiatives Review: Standards and the Extractive Economy. Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development & IISD. <https://bit.ly/2TddlCn>; World Economic Forum & Resolve (2015). Voluntary Responsible Mining Initiatives: A Review. <https://bit.ly/2x20hwE>

capacity to regulate. Of the MMSD recommendations that have not been effectively addressed, many are related to government and national-level industry action:

- national industry codes of conduct have not materialised outside of a handful of countries like Canada, South Africa, Mongolia and Australia
- industry-wide grievance handling mechanisms have remained elusive
- national-level regulation of the environmental and social performance of industry has in general been insufficient; and
- international legal instruments have been inconsistently implemented.

Coordinated action by governments can assist to overcome the challenges faced by individual governments in isolation. Frameworks like the Africa Mining Vision and gatherings like the Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (IGF), promote alignment across jurisdictions to simultaneously lift standards.⁴¹ The Africa Mining Vision (AMV) was adopted by the African Union Heads of State at the February 2009 African Union Summit. The AMV provides a framework for integrating mining into development policy across the continent. The AMV has its origins in two initiatives: 1) the 'Big Table', a dialogue between African Mining Ministers and their counter parts in the OECD to discuss the management of Africa's natural resources for growth and poverty reduction, organised by ECA and the African Development Bank in 2007; and 2) the report of the International Study Group on Africa's Mineral Regimes. The IGF was established following a proposal by South Africa and Canada at the Rio +10 Summit in Johannesburg, with membership now standing at 75 countries. The IGF Mining Policy Framework, for example, sets out principles for the regulation of issues including: environment, taxes and royalties, socio-economic benefits, closure and artisanal and small-scale mining. The IGF has undertaken assessments against the framework to benchmark member state performance.⁴²

Weak governance can be a significant driver of business risk, which is one reason that investors place conditions on finance. The IFC Performance Standards (PS) and the Equator Principles (which places standards on mining companies who lend from private sector banks), in particular, are motivated by the protection of capital from avoidable risk as well as the promotion of responsibility.⁴³ The PS have been one of the most successful contemporary governance initiatives and, according to one recent survey, amongst the most trusted standards in the sector.⁴⁴ More recently, institutional investors have become active on the issues of mine tailings and climate change, such as the Investor Mining and Tailings Safety Initiative and various initiatives of the Principles for Responsible Investment. There is potential to develop a similar initiative to the Equator

⁴¹ Franks (2015), *Mountain Movers*.

⁴² IGF (2013). IGF Mining Policy Framework: Mining and Sustainable Development. October. <https://bit.ly/2l8M2Z0>

⁴³ Franks (2015), *Mountain Movers*.

⁴⁴ World Economic Forum & Resolve (2015). Voluntary Responsible Mining Initiatives: A Review. <https://bit.ly/2x20hwE>

Principles for financial institutions that are beginning to lend to artisanal and small-scale miners through micro-finance schemes.

Communities and civil society organisations also play a very important regulatory and monitoring role. Social groups can influence change, through campaigns, demonstrations, the encouragement of strikes by employees, or extracting concessions through agreements and partnerships. Local-scale collaborative governance initiatives are commonplace in the mining sector, including in the monitoring of industry performance (for example, participatory water monitoring schemes).⁴⁵ Civil society campaigns such as Fatal Transactions (diamonds) and Publish What You Pay (transparency) have galvanised international action and been effective through appealing to public sentiment. A pattern has emerged where investigative research or reporting, combined with a campaign, has gone on to trigger the establishment of a number of governance initiatives, including the Kimberley Process Certification Scheme, Voluntary Principles on Security and Human Rights, Extractive Industries Transparency Initiative, EU Conflict Minerals Regulation and various initiatives on responsible cobalt. This governance dynamic has been a key driver of reform in the minerals industry, though it has prioritised highly visible and acute issues and commodities (especially consumer-facing commodities), while those with less visibility, such as the governance of sand and other domestic minerals have tended to be overlooked. Beyond advocacy, civil society often participates in the governance of the sector through partnerships with industry and government, multi-stakeholder initiatives, capacity building and education and awareness programs.

Historically, few international legal instruments have played a significant role in the governance of the mineral industry.⁴⁶ Notable exceptions include the Espoo Convention on Environmental Impact Assessment and the UNECE Convention on the Transboundary Effects of Industrial Accidents, which aims to support countries in the prevention of, preparedness for and response to industrial accidents, including those at mine tailings and with possible transboundary effects (see Table 1). The recent entry into force of the Minamata Convention on Mercury, has the potential to significantly reshape the use of mercury in the artisanal and small-scale gold mining sector. The convention is accompanied by capacity building programs to support artisanal and small-scale miners and the success of the treaty will potentially hinge on the ability to support practice change for informal gold miners rather than a punitive approach. Capacity building was a feature of the Communities and Small-scale Mining initiative (CASM), led by the World Bank, which was a forum of policy dialogue

⁴⁵ Porter, M, Franks, DM, Everingham, JA. (2013). Cultivating Collaboration: Lessons from initiatives to understand and manage cumulative impacts in Australian resource regions. *Resources Policy*. 38(4):657-669. <https://doi.org/10.1016/j.resourpol.2013.03.005>; Franks (2015), *Mountain Movers*.

⁴⁶ Bodle, R., Stockhaus, H., Sina, S., Gerstetter, C., Donat, L., Bach, I., Hermann, A., Manhart, A., Schuler, D., Gailhofer G., Lörcher, M., Feldt, H., Lozano Castro V., Baudin, I., Soerensen A.M. (2020). International Governance for Environmentally Sound Supply of Raw Materials – Policy Options and Recommendations. Environmental Research of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety Project No. (FKZ) 3716 32 103 0 Report No. FB000166. <https://bit.ly/32RqN7X>

and reform. In the absence of CASM, a gap has developed where artisanal and small-scale miners no longer have a voice at the international level.⁴⁷

While international agreements have not been a significant feature of mineral sector governance, this is not to say international institutions and action have not been meaningful. The United Nations was a key driver of the International Cyanide Management Code, the Kimberley Process Certification Scheme, the Mosi-oa-Tunya Declaration on Artisanal and Small-scale Mining, Quarrying and Development, the Africa Mining Vision and the current Global Tailings Review and proposed Standard. The International Resource Panel and a number of academic studies have proposed an International Minerals Agency, or the signing of an international agreement, to support member states and clarify responsibilities for the achievement of sustainable development of minerals.⁴⁸ Dialogue at the international level, building on the MMSD outcomes and legacy could complement the mineral resource governance agenda and renew the agenda for change.

⁴⁷ Franks, et al., (2020). Voices of artisanal and small-scale mining, visions of the future.

⁴⁸ IRP (2020). Mineral Resource Governance in the 21st Century; Ali, S., Giurco, D., Arndt, N. et al. (2017). Mineral supply for sustainable development requires resource governance.

Table 1 Common forms of regulation applied to sustainability issues in mining.⁴⁹

Types	How do they work	Examples
International legal instruments/norms, standards and frameworks	<p><i>Legal instruments/norms:</i> International legal instruments compel behavior through international law (commonly enforced through domestic law). Customary international law imposes obligations that arise from established international practices. International norms are non-legally binding and are adopted as a result of social pressure or peer expectation.</p> <p><i>Standards:</i> An international standard setting organization develops a standard that is voluntarily or enforced through certification. Certification may influence consumer behavior, be required by law, or be a condition of membership of an association.</p> <p><i>Frameworks:</i> International frameworks provide advice on effective or desirable policy and practice.</p>	<p><i>Legal instruments:</i> International Labour Organization Indigenous and Tribal Peoples Convention; United Nations Declaration on the Rights of Indigenous Peoples, Convention on Biological Diversity, Convention on Long-Range Trans-boundary Air Pollution, Montreal Protocol, UN Framework Convention on Climate Change, Ramsar Convention, World Heritage Convention, Basel Convention, Espoo Convention on Environmental Impact Assessment in a Transboundary Context and its Protocol on Strategic Environmental Assessment, UNECE Convention on the Transboundary Effects of Industrial Accidents, the Minamata Convention on Mercury</p> <p><i>Standards:</i> Extractive Industries Transparency Initiative; Kimberley Process Certification Scheme; Guiding Principles on Business and Human Rights; Voluntary Principles on Security and Human Rights; International Standards Organization guidance on social responsibility; International Cyanide Management Code for the Manufacture, Transport, and Use of Cyanide in the Production of Gold; Responsible Jewellery Council Code of Practices; and Initiative for Responsible Mining Assurance.</p> <p><i>Frameworks:</i> Africa Mining Vision; Natural Resource Charter; United Nations Millennium Development Goals; United Nations Sustainable Development Goals; New Partnership for Africa's Development; Protect, Respect and Remedy; International Study Group on Africa's Mineral Regimes; Framework Classification for Resources; United Nations Resource Management System; the Global Compact; and UNEP Global Mercury Partnership.</p>
Government regulation	Government (national, provincial, local) uses law and policy to proscribe conduct (command and control), persuade (suasive instruments), or incentivize behavior (market-based instruments).	Queensland Sustainable Resource Communities Policy (Australia); Northern Contaminated Sites Program (Canada); African National Congress State Intervention in the Minerals Sector (South Africa); and Cardin-Lugar Amendment to the United States Dodd-Frank Wall Street Reform and Consumer Protection Act (United States).
Industry standards	An industry develops a standard (commonly led by a peak industry association) that is observed due to peer expectations or to maintain membership of an industry association. Industry associations develop guidance in support of the standards.	International Council on Mining and Metals Sustainable Development Framework; International Council on Mining and Metals Position Statement on Indigenous Peoples and Mining; The International Union for Conservation of Nature – International Council on Mining and Metals Memorandum of Understanding; and Global Tailings Standard
Corporate standards and policies	Corporations adopt policies and standards to guide and direct company practices, employees or the supply chain.	Anglo American Social Way and Socio-Economic Toolbox; and Rio Tinto Biodiversity Strategy.
Conditions on finance and share market activism	<p><i>Conditions on finance:</i> Investors impose standards to be followed by loan recipients to reduce the risk associated with investment and to achieve desired performance outcomes.</p> <p><i>Share market activism:</i> Investors use their equity stake to influence management decisions through corporate governance processes.</p>	<i>Conditions on finance:</i> International Finance Corporation's Environmental and Social Performance Standards; International Finance Corporation's Compliance Advisor Ombudsman; and The Equator Principles.
Social pressure/ social regulation	Social groups persuade, encourage or force change in the behavior of individuals, institutions, government or corporations. Levers include reputation, conflict and blockades, strikes,	Publish What You Pay; Fatal Transactions; The Birdlife International – Rio Tinto Partnership; and Western Cape Communities Co-Existence Agreement.

⁴⁹ After Franks (2015), Mountain Movers.

	elections, agreements, and partnerships. Civil society groups may seek to mobilise public opinion through campaigns and networks.	
Litigation	A court of law imposes actions on a party to resolve a dispute.	Milirrpum v. Nabalco Pty Ltd (1971); and Mabo v. Queensland (1992).

Table 2. Governance instruments and initiatives with relevance to minerals.⁵⁰

No.	Initiative	No.	Initiative
1	Aarhus Convention	49	International Council on Mining and Metals Performance Expectations
2	Agreement Governing the Activity of States on the Moon and other celestial bodies	50	IFC – ‘A Strategic Approach to Early Stakeholder Engagement – A Good Practice Handbook for Junior Companies in the Extractive Industries’
3	Africa Mining Vision	51	IFC Performance Standards on Environmental and Social Sustainability
4	Akwé: Kon Voluntary Guidelines	52	International Financial Reporting Standards for extractive sector
5	Aluminium Stewardship Initiative	53	Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development /Mining Policy Framework
6	Batumi Initiative on Green Economy	54	ILO169 - Indigenous and Tribal People Convention 1989
7	The Business and Biodiversity Offsets Programme (BBOP)	55	ILO Convention on Mine Safety and Health (1995)
8	Base Erosion and Profit Shifting	56	Indigenous Rights in the Arctic
9	BetterCoal Code	57	Initiative for Responsible Mining Assurance
10	Better Gold Initiative	58	International Tin Research Institute (ITRI) Tin Supply Chain Initiative
11	Cobalt Industry Responsible Assessment Framework	59	Kimberley Process Certification Scheme
12	Communities and Small-Scale Mining	60	Local Procurement Reporting Mechanism
13	Connex Initiative	61	London Bullion Market Association - Responsible Gold Guidance
14	Convention on Biological Diversity	62	The Minamata Convention on Mercury
15	Convention Concerning the Use of White Lead in Painting	63	Mining Investment and Governance Review
16	Convention on The Regulation of Antarctic Mineral Resource Activities	64	Madrid Protocol on Environmental Protection to the Atlantic Treaty
17	Committee for Mineral Reserves International Reporting Standards	65	NamiRo
18	Conflict Free Gold Standard	66	Natural Resource Charter/Natural Resource Governance Institute
19	Conflict Free Sourcing Initiative-Conflict Free Smelter	67	Natural Resources Risk Index
20	Chinese Due Diligence Guidelines for Responsible Mineral Supply Chains	68	OECD Due Diligence Guidance for Responsible Supply Chain Management of Minerals for Conflict Affected and High-Risk Areas/ OECD Due Diligence Guidance for Meaningful Stakeholder Engagement in the Extractive Sector
21	China Chamber of Commerce of Metals, Minerals and Chemicals Importers and Exporters (CCCME)- Guidelines for Social Responsibility in Outbound Mining Investments (GSRM)	69	The Global Forum on Transparency and Exchange of Information for Tax Purposes
22	Commonwealth Mining Network	70	Oil for Development
23	Certified Trading Chains	71	The planetGOLD programme
24	Diamond Development Initiative/ Diamond Development Standard	72	Prospectors & Developers Association of Canada e3 Framework for Responsible Exploration
25	Devonshire Initiative	73	Public-Private Alliance for Responsible Minerals Trade
26	US Dodd-Frank Act (Section 1502)	74	Publish What You Pay
27	EICC Environmental Sustainability Working Group	75	Australian Steel Stewardship Forum/ Steel Stewardship Council Ltd
28	Espoo Convention on Environmental Impact Assessment in a Transboundary Context and its Protocol on Strategic Environmental Assessment	76	Responsible Jewellery Council
29	European Innovation Partnership on Raw Materials (EIP)	77	Responsible Cobalt Initiative
30	Extractive Industries Transparency Initiative	78	The Responsible Mineral Development Initiative
31	Equitable Origin	79	The Responsible Mining Foundation - Responsible Mining Index
32	Equator Principles	80	Raw Materials Initiative (RMI)
33	European Partnership for Responsible Minerals	81	Responsible Raw Materials Initiative (RRMI)
34	The European Technology Platform on Sustainable Mineral Resources	82	Solutions for Hope
35	Alliance for Responsible Mining (ARM)-Fairmined Standard	83	The Stolen Asset Recovery (StAR) initiative
36	Fairtrade Gold and Precious Metals	84	Strategic Dialogue on Sustainable Raw Materials for Europe
37	The Financial Action Task Force	85	The Access Initiative
38	Forum on Raw Materials	86	Towards Sustainable Mining
39	Fraser Institute Annual Survey of Mining & Exploration Companies	87	United Nations Convention on the Law of the Sea (UNCLOS)
40	Framework for Responsible Mining	88	UNDP Strategy for Sustainable and Equitable Management of the Extractive Sector for Human Development
41	The Global Battery Alliance Initiative	89	UN Framework Convention on Climate Change
42	Green Mining Initiative (GMI)	90	UNECE Safety Guidelines and Good Practices for Tailings Management Facilities
43	The Green Lead Initiative	91	UNEP Global Mercury Partnership
44	Global Reporting Initiative	92	UN Global Compact
45	Global Tailings Review	93	UN Guiding Principles on Business and Human Rights

⁵⁰ Expanded after IRP (2020). Mineral Resource Governance in the 21st Century. Note that this list is not exhaustive. In particular, it omits initiatives/laws/policies at the national (and to an extent, regional) level.

46	Health in the Extractive Industries	94	UN Framework Classification for Resources
47	The International Conference on the Great Lakes Region – Regional Initiative against the Illegal Exploitation of Natural Resources	95	Voluntary Principles on Security and Human Rights
48	International Cyanide Management Code for the Manufacture, Transport, and Use [of] Cyanide in the Production of Gold		

Table 3 Summary of actions to support sustainable development in the minerals industry from the Mining, Minerals and Sustainable Development project.⁵¹

<i>Summary of actions recommended by Breaking New Ground</i>	
<ul style="list-style-type: none"> • Greater research and education to better understand the implications of mining and minerals production on sustainable development. • Development of corporate policies and management systems to embed sustainable development commitments. • Adoption of a global declaration by the minerals industry and a protocol to ensure industry-wide implementation (including independent auditing). • Development of national industry codes of conduct. • Drafting of a collective statement of principles by civil society outlining their expectations. • Improved government policy and regulation, including the avoidance of riverine disposal of tailings, and the wider adoption of financial surety to ensure rehabilitation after mine closure. • Better integration within impact assessment. • Integrated planning for the closure of operations. 	<ul style="list-style-type: none"> • Creation of project level and industry wide grievance handling and dispute resolution mechanisms. • Respect for the principle of free prior and informed consent from Indigenous Peoples. • Wider use of agreement making processes with communities and indigenous peoples. • Establishment of an international and public register of all payments by mining companies to governments at all levels to address corruption. • Harmonization of reporting guidelines. • Development of clear criteria between the mining industry and key actors like the IUCN on mining and protected areas. • Establishment of a global financial facility to remediate abandoned mines and a global initiative to address mining legacies. • Creation of an ongoing multi-stakeholder forum on mining, minerals and sustainable development.

⁵¹ Source: IIED and WBCSD (2002), *Breaking New Ground*

Questions for consultation:

- What meaningful action could be undertaken at the international level to strengthen mineral resource governance?
- What are the gaps in the governance of minerals in your jurisdiction? And how could these gaps be addressed?
- How can member-states, companies, and civil society be supported to advance sustainable development of minerals at all scales?
- Which governance options could progress sustainable development most in your contemporary context?
- How could such initiatives be supported and what are the opportunities and barriers to implementation?
- Do member-states, companies and civil society have enough knowledge on the available governance options and the implications of their implementation?
- Are there other governance options not suggested that should be considered?

BEST PRACTICES FOR SUSTAINABLE DEVELOPMENT OF MINERAL RESOURCES

This section provides examples of innovation and leading practice in the minerals sector to prompt further discussion during the consultations.

<p>Zero waste mine, re-use of waste rock and tailings, dry tailings production, and benign mine tailings with reduced environmental risks</p>	<p>Dry tailings: One major international mining company is systematically transitioning to safer methods of tailings storage reporting that 55% of their tailings facilities use dry-stack or in-pit storage (60% of new facilities built in the past decade).</p> <p>Zero waste: At a Brazilian mine, a modification of the production process resulted in the elimination of waste generation, producing secondary products for agricultural application. These products generated 12% of the unit’s revenues in 2018.</p>
<p>Reductions in mine site water demand and uptake of water accounting frameworks</p>	<p>Water consumption: A uranium mine in Namibia has committed to an overall reduction of water consumption by 35% from 2008 levels. It will achieve this through a range of initiatives including improved efficiency, water accounting, and desalination. There are plans to share excess desalinated water with regional communities and other industrial sites.⁵²</p>
<p>Shared infrastructure for water, power, rail, ports</p>	<p>Water infrastructure: After consulting with a local water users’ committee, a mine in Chile agreed to co-finance water infrastructure in the mine’s region to improve the local population’s access to potable water, sewerage, and manage river water supply. The company also used a portion of the treated water for a mine expansion.⁵³</p>
<p>Mined land rehabilitation, closure and re-purposing of post-mined landscapes</p>	<p>Repurposing: A mine in Canada carefully planned closure in advance, taking into account the local community. They promoted repurposing of the mine site post-closure for alternative economic activities including aquaculture and timber processing, and provided retraining opportunities.⁵⁴</p> <p>Community engagement: As part of closure planning in Australia, a company engaged with Indigenous Traditional Owners to develop preferred closure scenarios, including opportunities for Indigenous participation in rehabilitation, land management, and decisions about project infrastructure.⁵⁵</p> <p>Policy: APEC published a “Mine Closure Checklist for Governments” to assist regional governments work through the steps required for a successful mine closure and identify gaps in existing mine closure policy frameworks.⁵⁶</p> <p>Renewable energy: A reclaimed mine concentrator in Canada has been converted into a large-scale, commercial solar power station producing</p>

⁵² https://www.icmm.com/website/publications/pdfs/water/water-management-in-mining_case-studies

⁵³ <https://www.igfmining.org/the-power-of-partnership/>

⁵⁴ https://www.igfmining.org/wp-content/uploads/2019/04/218_MTF_Mine-Closure_Checklist-for-Governments-1.pdf

⁵⁵ https://www.igfmining.org/wp-content/uploads/2019/04/218_MTF_Mine-Closure_Checklist-for-Governments-1.pdf

⁵⁶ https://www.igfmining.org/wp-content/uploads/2019/04/218_MTF_Mine-Closure_Checklist-for-Governments-1.pdf

	<p>1MW of power, with the potential to expand to 15MW. Collaboration between the company, province, regional development trusts and the local community enabled this project's development.⁵⁷</p> <p>Biodiversity partnerships: Nature After Minerals (NAM) partnership programme is a collaboration between conservation and minerals associations in the UK. The programme works with mineral planners, industry, statutory bodies, conservation organisations and local communities to make substantial contributions to priority habitat creation and boost priority species populations, while providing nature rich places for people to enjoy.⁵⁸</p>
<p>Alignment between landscape-level planning processes and mineral licensing regimes</p>	<p>Policy alignment: Portugal updated its Policy and Regulatory Framework on Mineral Resources to ensure that the legislative frameworks at national, regional and local levels complement each other. This framework enables land-use planning to integrate the various natural resource uses.⁵⁹</p>
<p>Participatory decision making and partnerships with communities and civil society</p>	<p>Participatory decision-making: Sweden's Mineral Strategy takes a 'stakeholder-centred' approach, emphasizing communication and participation opportunities. These principles are supported by mechanisms and tools for engaging across ministries and with different stakeholder groups.⁶⁰</p> <p>Industry-Community Dialogue: Finland has established a 'Network for Sustainable Mining' to improve dialogue between the mining industry and other stakeholders.⁶¹</p>
<p>Community-led impact assessment and participatory monitoring of mining projects</p>	<p>Disclosure of environmental monitoring: A mine in Chile publicly reports real time data on air and water quality via the use of smart sensors.⁶²</p>
<p>Mines owned and operated by Indigenous Peoples</p>	<p>Indigenous ownership: The first Indigenous owned and operated mine in Australia opened in 2017. The bauxite mine will provide employment for 65-100 people, and the associated training college will enable skills development.⁶³</p>

⁵⁷ <https://www.igfmining.org/wp-content/uploads/2018/03/IGF-Innovation-in-Mining-IMMS-Report-2018.pdf>

⁵⁸ <https://ec.europa.eu/environment/nature/natura2000/management/docs/NEEI%20case%20studies%20-%20Final%20booklet.pdf>

⁵⁹ https://www.min-guide.eu/sites/default/files/project_result/MIN-GUIDE_D2%202%20policy%20governance%20frameworks_final_0.pdf

⁶⁰ https://www.min-guide.eu/sites/default/files/project_result/MIN-GUIDE_D2%202%20policy%20governance%20frameworks_final_0.pdf

⁶¹ https://www.min-guide.eu/sites/default/files/project_result/MIN-GUIDE_D2%202%20policy%20governance%20frameworks_final_0.pdf

⁶² <https://www.igfmining.org/why-social-innovation-is-crucial-in-mining/>

⁶³ <https://gulkula.com/>

<p>Renewable energy generation at mine sites</p>	<p>Solar: A mining company in Suriname financed the construction of a 5MW solar project to increase the power available to the mine in peak periods.⁶⁴</p> <p>Policy: Several large mining companies in Chile have responded to the government’s “Energia 2025” power policy target for 20 percent of all Chilean energy to come from renewable sources by 2025. Major companies have signed agreements for up to 100% of their energy to be supplied by third-party renewable companies, while some have built their own solar and wind projects.⁶⁵</p>
<p>Regularisation and formalisation of artisanal and small-scale mining</p>	<p>ASGM: The National Bank of Ethiopia encourages miners to sell gold to the bank at 105% of the LBMA. The higher price aims to draw ASM gold into the formal market by out-competing alternate buyers and providing financial and non-financial support for miners.⁶⁶</p>
<p>Representation and support of women artisanal miners through mining associations</p>	<p>Women: TAWOMA – the Tanzania Women Miners Association – was established in 1997 to support women’s health and welfare, and provide a range of supports to improve environmental safety and commercial performance.⁶⁷</p>
<p>Local benefit sharing and agreement making with Indigenous Peoples</p>	<p>Benefit-sharing Agreements: A long-life mine in the USA operates under an agreement with the local Indigenous Peoples. Under the agreement allowing the mine to be built, the Indigenous Peoples’ Organisation receives annual payments, increasing over the life of the mine until the profit is shared equally.</p> <p>Local Development Funds: Ivory Coast, Burkina Faso, Senegal and Mali have introduced institutional mining funds for local development (MFLDs). MFLDs collect income directly from mining companies and/or as a share of central revenues, and allocate funds to local communities with the aim of improving development outcomes for communities close to mining operations.⁶⁸</p>
<p>Collaborative planning, knowledge sharing, dialogue-based solutions</p>	<p>Strategic Dialogue: The Strategic Dialogue on Sustainable Raw Materials for Europe (STRADE) brought together the EU and resource rich countries in order to develop a more responsible sourcing approach, addressing all dimensions of sustainability: economic, social & environmental.⁶⁹</p>

⁶⁴ <http://ccsi.columbia.edu/files/2018/12/3418-CCSI-RE-and-mining-report-09-lr-reduced-optimized-07-no-links.pdf>

⁶⁵ <http://ccsi.columbia.edu/files/2018/12/3418-CCSI-RE-and-mining-report-09-lr-reduced-optimized-07-no-links.pdf>

⁶⁶ <https://pubs.iied.org/pdfs/16610IIED.pdf>

⁶⁷ <https://www.iisd.org/sites/default/files/publications/igf-women-asm-challenges-opportunities-participation.pdf>

⁶⁸ <https://www.igfmining.org/impact-of-the-mining-sector-on-local-development-will-institutional-mining-funds-for-local-development-be-a-game-changer/>

⁶⁹ https://www.stradeproject.eu/fileadmin/user_upload/pdf/STRADE_Final_Report_2018.pdf

Questions for consultation:

- What other good or best practice cases exist to inspire the next phase of sustainability in the extraction and use of minerals?
- What can the mineral sector learn from the governance of other types of natural resources?
- How do different stakeholders lead on promoting and achieving best practice?
- What regional variations exist in the social, environmental, geological and governance contexts that shape the outcomes of best practice examples?

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