

## Critical minerals and the new development dilemma: What the WBG's new strategy must get right

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To succeed, the World Bank's new minerals strategy must reckon with a much harder reality than the framing of "win-win" development and clean transitions suggests. Critical minerals now sit at the intersection of geopolitical rivalry, national industrial ambitions and intensifying local conflicts over land, water and environmental damage. Moving beyond foreign direct investment attraction and weak local-content policies towards innovation-led diversification requires recognising the centrality of innovation policies, the political economy of mineral-dependent countries, their domestic tensions and the growing crisis of legitimacy that surrounds extraction in producing territories. Accountability, citizen engagement and institution-building matter not as abstract principles, but as concrete conditions for addressing these challenges.

The World Bank's stance on critical minerals – shaped by [Minerals for Climate Action](#), its [Extractives Global Programmatic Support](#) work, and related toolkits – has relied on a familiar mix of development ambitions, governance reforms and sustainability goals. By framing critical minerals as strategic enablers of the low-carbon transition, this approach positions them as an opportunity for long-term transformation, suggesting that, under appropriate institutional conditions, rising mineral production can support diversification in producer countries while contributing to the global public good of reducing carbon emissions. As the Bank prepares to release its first dedicated minerals and mining strategy, each of these areas merits careful re-examination. Past experience in resource-rich economies, and today's rapidly shifting context, show the need for a deeper look at what has and has not worked. I discuss the four main areas that need revision.

### Development focus and geopolitics: moving beyond extraction

The renewed emphasis on helping producer countries move beyond

extraction into more diversified, value-adding mineral chains is welcome but not new. Decades of research, [from resource curse debates to innovation-systems work](#), show that natural resources can drive diversification. Evidence from middle-income economies such as [Argentina](#), [Brazil](#), [Chile](#) and South Africa confirms that where existing manufacturing and technological capabilities are leveraged, resource sectors, from mining to renewables, can lead to diversification. Yet success remains the exception rather than the rule (see [Dispatch Springs 2023](#)).

### Two lessons stand out

Firstly, "adding value" should not be equated with producing final goods such as batteries. Processing and refining matter, but the most realistic and transformative opportunities lie in developing sophisticated supplier ecosystems around extraction and processing. These supplier spaces – logistics, arbitrary testing, drilling and geotechnical services, hydrological and environmental solutions, automation and digital monitoring – offer multiple entry points. They can [build on existing domestic capabilities](#) and later serve



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other industries and export markets, reducing dependence on the resource itself.

Secondly, diversification must become knowledge-intensive. Sustainable gains arise when economies expand into [specialised, knowledge-driven services and products](#) are [rooted in local problem-solving](#). Natural resources operate under highly specific conditions, and firms that design tailored solutions – such as climate-adapted engineering or high-altitude extraction services – often gain lasting advantage. Locally driven innovation focused on site-specific challenges, supported by smart environmental regulation, can become the engine of durable diversification (see *Observer* [Autumn 2023](#)).

#### **Policies: what works and what doesn't**

Experience across regions shows that turning mineral wealth into structural transformation and diversification – not renewed dependency – requires a mix of policies that go beyond generic investment promotion and the “good institutions” agenda traditionally emphasised by the Bank. Without this, countries will continue [“exporting raw materials and importing manufactures”](#), [remain exposed to price swings](#) and [social tensions](#), and retain only [limited capacity to capture value](#) along the chain (see *Observer* [Autumn 2023](#)).

In today's geopolitical context, marked by supply-security anxieties, export bans have returned to prominence. [Indonesia's partial success](#) in using them to attract nickel refining and battery investments [has inspired imitation](#). Yet they are only one tool, and not necessarily the most effective for most low- and middle-income countries. [Bolivia's experience provides a counterpoint](#): despite ambitious efforts to capture more value from lithium through restrictive export and partnership rules, results have fallen short. Such strategies demand a base of technological and institutional capability, coherent industrial planning, and credible partnerships with firms able to transfer technology and skills. Export restrictions without clear plans, specifying which activities will be

developed, how they will be financed, and how capabilities will be built, have little chance of working.

[Local-content policies](#) (i.e. requirements to buy a certain amount of local goods, services, or labour) are also double-edged. They are politically attractive and easy to monitor but often generate limited learning or linkages. Quotas are frequently met through low-complexity purchases, catering, transport and basic logistics, offering little scope for upgrading. When used, local-content rules should be tied explicitly to capability-building targets, technological upgrading, and measurable performance metrics for firms and public agencies. In federal systems, coordination between national and subnational authorities is vital to avoid fragmentation and competition over benefits.

The most promising path lies in linking diversification to innovation and productive development. This means treating local operational and environmental challenges – such as high altitude extraction, water scarcity and tighter environmental standards – as opportunities for innovation connecting firms, universities and operators. It also requires viewing well-crafted environmental regulation as an asset that incentivises lead firms to engage domestic actors. Diversification should proceed in tiers, beginning in segments with lower complexity and progressing toward more sophisticated goods and services, while aligning mining demand with pre-existing strengths and capabilities.

Finally, complementary capabilities matter. Policy debates often focus narrowly on production and technology transfer, overlooking the regulatory, negotiation, financial and organisational capabilities that shape firms' ability

to exploit new opportunities as Moreales and me will demonstrate in a forthcoming paper. Crucially, none of this is feasible unless the political dimensions of diversification, ever more prominent, are recognised and addressed.

#### **National stakes**

At the national level, diversification policy is shaped by institutional weaknesses, tensions and trade-offs. Implementation capacity is often thin and dispersed, and when fiscal space is tight, attracting investment tends to outweigh the slower,

politically demanding task of building local capabilities, especially when this requires placing conditions on investors. In this setting, the push for foreign investment, frequently encouraged by the World Bank, can undermine the prioritisation and coordination needed for long-term upgrading. Political-economy pressures that favour capital inflows and liberalisation over

capability formation might be reinforced by the Bank's focus on mobilising private investment unless these trade-offs are made explicit (see *Observer* [Summer 2025](#)).

Contrasting experiences such as [Argentina's Régimen de Incentivos para Grandes Inversiones](#) (RIGI) – an investment regime offering tax, foreign exchange and regulatory stability guarantees to large investors – and Indonesia's nickel export bans, which attempt to compel domestic processing through trade restrictions, illustrate how countries are pulled in opposite directions, each with its own constraints and risks. These cases underscore how unsettled the balance remains between attracting investment and strengthening domestic capabilities. As the Bank expands its support for “responsible” mining projects to make them both bankable and scalable, addressing these tensions openly, and managing them

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through institutional coordination and iterative learning, will be vital if its new mining strategy is to turn diversification goals into practice rather than rhetoric.

### Global stakes

An increasingly urgent challenge, often missing from value-addition debates, is geopolitics. Barriers to entry into high-value segments have always existed: [value chain studies](#) long showed that firms retain high-value activities within their borders or a small circle of established partners. However, today, these barriers are hardening. Rising geopolitical tensions and new industrial strategies are reshaping trade in critical minerals. Policies of friend-shoring, onshoring and tightly controlled bilateral deals increasingly guide investment and supply decisions. Many advanced economies now seek to internalise or tightly control the most sophisticated stages of production, refining, component manufacturing and technology development. This push for strategic autonomy will intensify competition among supplier countries and risks leaving behind those unable to secure privileged partnerships.

Entering value chains is therefore becoming less about competitiveness and more about control and security. If this trend continues, opportunities for inclusive and sustainable diversification in the Global South will narrow further. The only viable response is stronger South–South cooperation, combining pooled capabilities, harmonised standards and strengthened collective bargaining in emerging critical-minerals governance. The World Bank could more actively support such cooperation among Southern countries, not only through policy dialogue but by reinforcing initiatives such as the [African Green Minerals Alliance](#), a possible Latin American Lithium and Salt Flats Alliance, and regional efforts to [coordinate standards and bargaining strategies](#). These efforts, though still fragile, represent concrete steps toward building collective capacity and resilience in a rapidly fragmenting global order.

### Governance and institutional capacity: from conflict to legitimacy

The second area aligns with the World Bank's traditional focus on institutional strengthening and improved governance, stronger laws, regulation, transparency and citizen engagement, applied to critical minerals. This remains essential, yet it must confront long-standing challenges specific to resource governance. "[Resource curse](#)" research shows that beyond familiar macroeconomic shocks (price volatility, external imbalances, Dutch disease), the most corrosive effects are political. Large rents weaken accountability by reducing reliance on taxation, fuel rent-seeking and elite capture, and, where institutions are fragile, enable revenue mismanagement that entrenches power and perpetuates [cycles of corruption, polarisation, and very often violence](#). Resource booms typically [provoke conflict with severe human, economic and institutional costs](#), disrupted labour markets, investment flight and weakened state capacity.

Over the past two decades, "conflict-minerals" due-diligence regimes (e.g. [Dodd-Frank §1502](#) and [EU regulations](#)) have sought to mitigate these risks by disrupting the link between mineral extraction and armed violence. While these measures have helped to curb funding to armed groups in some 3TG (tin, tantalum, tungsten and gold) supply chains, their broader effects have been mixed. In many contexts, they have contributed to *de facto* embargoes, increased informality and significant income losses for artisanal miners, while leaving largely untouched the deeper socio-environmental tensions that now drive conflict and social resistance around mining. These unresolved tensions have, in turn, fed what can be [described as a wider legitimacy crisis](#) in the mineral sector.

What is different today – and what the Bank's new strategy must squarely address – is that resistance to mining is no longer confined to specific regions, fragile states, or low-income countries. Across multiple territories,

mining expansion is unfolding amid environmental degradation, water competition, land-use disputes and perceptions that benefits accrue elsewhere. This is [fuelling widespread and increasingly organised contestation](#), including in countries with relatively strong institutions. This is therefore not merely a risk to "manage"; it raises more fundamental questions about the legitimacy of extraction itself.

The Bank's strategy should therefore treat legitimacy as a core governance outcome, embedding early, continuous and decision-shaping participation, alongside robust accountability, throughout the project and policy cycle. This will [benefit both mineral producers and consumer countries](#).

Two lessons emerge from recent research in [Latin America](#), [Africa](#) and [Asia](#). First, legitimacy is institutional, not communicational: resistance stems from exclusion and mistrust in how extraction is governed. Second, legitimacy requires experimentation and shared learning. Participation becomes transformative when it co-shapes technologies, locations and operational models. The Bank should support local "transformation labs" where communities, governments and firms jointly test solutions. These can turn resistance into cooperation and generate scalable pathways to cleaner, fairer mining practices.

In short, building governance and capacity means not only improving regulation and transparency but creating institutional conditions for legitimate, negotiated and genuinely sustainable extraction.

### Sustainability: from global goals to local control

The World Bank, like other global institutions, prioritises system-wide sustainability goals: decarbonising mining and processing, building climate-resilient operations, and reducing material footprints through recycling and circularity. These are essential, yet in mining they collide with stubborn local realities. Extraction competes with farming for water use, degrades

rivers and soils, and leaves long-term liabilities such as tailings and hazardous waste. It also entails major occupational and public-health risks, from cyanide in leaching to tailings dams and underground blasting. When failures occur (e.g. Brumadinho in Brazil and cyanide spills in San Juan, Argentina), the damage is lethal and long-lasting for workers, communities and ecosystems. The Bank's new strategy should therefore place local environmental challenges related to critical minerals at the centre, not only global concerns.

## Policies

The dominant approach has expanded market-supporting "soft technologies": certification, voluntary standards and transparency tools – e.g. the Initiative for Responsible Mining Assurance (IRMA), and the Responsible Mining Initiative (RMI), enabling buyers and investors to reward better performers. Parallel due-diligence requirements in consumer markets aim to pull firms toward improved practices along supply chains. These steps set expectations but rarely shift behaviour in a highly concentrated, business-to-business sector with limited consumer pressure. Voluntary schemes struggle without credible enforcement, and international guidelines are unevenly applied in low- and middle-income countries (LMICs).

What is needed is a harder-edged, locally grounded package that makes key environmental and social rules mandatory and links them to industrial and innovation policy. This includes rigorous monitoring and public disclosure; finance and procurement that reward compliance and continuous improvement; and participatory processes with real decision weight, so projects can be redesigned (pace, technology, even location) rather than

merely "consulted on". Where civic space and access to information are protected, local mobilisation remains one of the strongest checks on poor practice and a driver of safer, cleaner project design.

## (Re)framing: from decarbonisation to security

A crucial issue is how the drivers of mineral demand are conceptualised. If the World Bank continues to frame the surge in demand primarily through clean-energy and digital transitions, it will miss a rapidly expanding dimension: defence-related demand. As [Johnstone and I argue](#), military mobilisation and war-driven technological change increasingly shape what counts as "critical", where extraction expands, and under what conditions. Rising geopolitical tensions, rearmament programmes and the reclassification of materials as "defence-critical" have already prompted stockpiling, new strategic alliances and access agreements across producing regions. Although systematic evidence is still emerging, these shifts have far-reaching implications for development and sustainability: they restrict knowledge flows and linkages with domestic suppliers, compress project timelines, weaken social and environmental safeguards, and narrow the space for civic participation and democratic oversight. As supply chains become more entangled with national-security agendas, producer-country governments face pressure to deliver "secure" and "friendly" supply, challenging their autonomy and capacity to design development policies. The Bank's strategy must therefore recognise and analyse this securitisation of demand and build explicit safeguards around it.

## Conclusion

The World Bank's new minerals strategy will only succeed if it moves decisively beyond a narrow focus on foreign investment attraction, regulatory reform and generic notions of "good institutions". Today's shifting geopolitical context shows that critical minerals are no longer merely a climate or development issue, but a terrain of industrial competition, national security and intensifying social contestation. Past experience and current legitimacy challenges suggest that, if the strategy is to support diversification rather than renewed dependency, it must place innovation, domestic capability-building and political legitimacy at its core, while openly confronting the tensions between global security agendas, investor interests and local environmental and social demands.

This cannot be achieved through technical fixes alone. It requires robust accountability mechanisms and meaningful, continuous citizen engagement. The growing securitisation of mineral demand further raises the stakes: militarisation risks accelerating project timelines, weakening safeguards and narrowing opportunities for local value addition and democratic oversight. Without confronting these trade-offs directly, ambitions for development, sustainability and inclusion in the mineral sector will remain largely rhetorical.

