# Balancing clean energy mineral demand with infectious disease risks in Africa



The global pursuit of a clean energy transition has intensified demand for critical minerals essential to technologies such as sustainable transportation systems, electric vehicles, solar panels, wind turbines, and grid battery storage. As many countries seek to diversify supply chains to meet a projected two- to fivefold increase in mineral demand by 2050 under net-zero emissions scenarios, regions rich in these resources have become focal points. Notably, the African continent hosts substantial reserves of critical transition minerals. The Democratic Republic of the Congo (DRC) alone accounts for more than 55% of global cobalt reserves and produces approximately 75% of the world’s cobalt. Guinea in West Africa holds the largest bauxite reserve, the primary ore for aluminium and a source of gallium. Southern Africa, particularly South Africa, contains over 70% of the world's platinum, while Zimbabwe is home to the continent's largest untapped lithium deposits.

While mineral extraction brings economic prospects, recent analyses highlight emergent public health concerns linked to mining activities, particularly infectious disease risks. Mining operations often involve habitat encroachment—disrupting ecologically rich environments and increasing the likelihood of spillover, emergence, reemergence, and wider spread of infectious diseases (SES). Studies from the past thirty years indicate that mining activities in biodiverse African regions have been associated with outbreaks of several emerging and reemerging infectious diseases. For example, gold mining in the Goroumbwa cave area of the DRC contributed to disease outbreaks between 1998 and 2000, while gold and lead mining in Uganda’s Kitaka mines were linked to outbreaks in 2007. More recently, mining areas in the DRC’s Biakato Mines in 2018–2019 and Kamituga in 2023 have been connected to the emergence of more severe strains of the Mpox virus.

The intricacies of mining-related disease risk are linked to the natural habitats of certain reservoir host species. Egyptian rousette fruit bats, which naturally roost in caves and mines, serve as reservoirs for known pathogens such as the Marburg virus alongside other undiscovered pathogens. Anthropogenic disturbances from mining increase human contact with these bats, heightening the risk of zoonotic disease spillover. Additionally, climate change exacerbates these vulnerabilities by forcing bat migration into new areas, potentially spreading diseases to previously unaffected populations with little immunity and facilitating sustained human-to-human transmission.

In response to these challenges, there is a critical gap in current environmental and health impact assessments (EIAs) and associated policies, which largely omit considerations for biosecurity and health security safeguards. Over 450 policies tracked by the International Energy Agency (IEA) on critical minerals supply do not explicitly call for integrating biosecurity risk analysis into mining operations. Experts advocate for the development and enforcement of Environmental, Social, and Governance (ESG) standards that explicitly include global health security considerations, aiming to holistically protect ecosystems, mining workforce, and surrounding communities.

International initiatives like the Mineral Security Partnership (MSP)—a coalition including Australia, Canada, several European nations, India, Japan, South Korea, the United Kingdom, the United States, and the European Union—are actively working on diversifying critical mineral supply chains with numerous projects across Africa. However, experts stress the urgent need for these partnerships to incorporate biosecurity risk assessments as a mandatory part of mining project evaluations. This would involve comprehensive analyses covering environmental drivers of disease risks, socio-behavioural factors increasing human vulnerability, and systemic deficiencies in coping capacities that facilitate pathogen spillover and transmission.

Collaboration among a wide range of stakeholders is viewed as essential. This includes African governments and technical bodies such as the African Union (AU), the Africa Centers for Disease Control and Prevention (Africa CDC), and the Quadripartite institutions comprising the Food and Agriculture Organization, the United Nations Environment Programme, the World Health Organization, and the World Organisation for Animal Health. The Quadripartite has specifically identified mining and other anthropogenic activities that increase zoonotic spillover as critical areas for pandemic prevention efforts.

In the realm of policy development, incorporating SES risk analyses into EIAs aligns with broader global health objectives such as those proposed in the ongoing negotiations of the Pandemic Prevention, Preparedness and Response Accord. This framework aims to enhance cross-sector cooperation to prevent, detect, and respond to pandemic threats at their source. Additionally, efforts by the newly formed Panel on Critical Energy Transition Minerals seek to integrate considerations of justice, equity, and sustainability, including health security, into clean energy policy discussions.

Technological solutions also play a pivotal role, with advocacy for policies enabling the use of Earth observation and remote sensing technologies to monitor environmental changes linked to mining activities. These technologies can track land use alterations, temperature fluctuations, and greenhouse gas emissions, which contribute both to climate change and pathogen habitat shifts. Agencies such as NASA have demonstrated successful applications of such data in public health surveillance, including infectious disease tracking. Combining remote sensing with advanced genomic sequencing holds promise for early detection of pathogens with epidemic or pandemic potential.

The integration of comprehensive health risk assessments into mining operations requires that regulatory agencies—including the U.S. Environmental Protection Agency and the DRC’s Agence Congolaise de l’Environnement—work closely with regional and international health bodies. Mining companies and investors must also take responsibility for implementing risk mitigation and communication strategies informed by robust data and analyses.

As global demand for critical minerals surges amid clean energy transitions, these multifaceted approaches seek to balance resource development with the prevention of health crises. Ensuring that mining operations incorporate health security considerations stands as a complex but necessary undertaking involving coordinated policy frameworks, technological innovation, and international cooperation.

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## Bibliography

1. <https://www.iea.org/topics/critical-minerals> - This URL supports the claim that the clean energy transition is driving a significant increase in demand for critical minerals and highlights the importance of increasing mineral supply to meet these demands. It also discusses investment trends in the mining sector.
2. <https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions/executive-summary> - This URL provides further details on how clean energy technologies are becoming the fastest-growing segment of demand for minerals such as lithium, nickel, and cobalt. It emphasizes the need for increased supply to meet ambitious climate goals.
3. <https://www.irena.org/Digital-Report/Geopolitics-of-the-Energy-Transition-Critical-Materials> - This URL corroborates the notion that the energy transition is mineral- and metal-intensive, highlighting the geopolitical implications of critical mineral demand. It discusses the role of these minerals in supporting clean energy systems.
4. <https://www.un.org/en/climatechange/critical-minerals> - This URL confirms that demand for critical minerals will almost triple by 2030 as the world moves toward renewable energy, underscoring the need for diversified supply chains and sustainable mining practices.
5. <https://www.weforum.org/stories/2024/01/energy-transition-critical-minerals-technology/> - This URL supports the argument that critical minerals are essential for the energy transition but notes that their extraction poses environmental and health risks. It calls for comprehensive approaches to manage these challenges.
6. <https://www.unenvironment.org/resources/quadripartite-report-pandemic-prevention-and-preparedness> - This URL, while not directly linked, is part of broader discussions involving the Quadripartite institutions on enhancing cooperation for pandemic prevention. It aligns with the idea of integrating biosecurity and health security measures into environmental impact assessments related to mining.
7. <https://news.google.com/rss/articles/CBMijAFBVV95cUxNX0phV1JFVXhtV1hVc2c3ZU9GNWhlRjJvcXRPaVFEWi12SU5PODRsS2tqdE53NkgwaUxWYUVsTGlmVlZyQ0V2a3FjaFREY01Ndnl0VGNqQWVaRkJid0lQU3dHbTBFRVVSd3oyRnlRRVpKUVd1M29Nbzc1YjYtbkZ1eXRkOENJQ1JLSHBtTA?oc=5&hl=en-US&gl=US&ceid=US:en> - Please view link - unable to able to access data