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Exploration, Mining and Biodiversity in Angola: A New Business Model

Luis Chambel, Sandra Amaro, Luis Caetano
Sinese, Sardoal, Portugal

Geopolitical tension is heightened and increasing, with war, threats to free trade, and an increasing fragmentation of the global economy into conflicting blocks. There is a markedly increased supply risk, especially in energy, high-tech, energy transition, and defence commodities.

The world needs a sustainable economic model and a new energy paradigm, for which we need an expanded set and higher tonnage of minerals, with a smaller negative impact on the planet and human societies. Yet, mineral deposits are increasingly deeper, of lower grade, and with higher complexity, in more remot areas, with stricter mining regulation, with a harder-to-get social license to operate, and with competing land uses; with decreasing grades, the energy and water consumption and land use per ton of mined metal increase, with biodiversity and ecosystems under increasing pressure -- a trend that can only be countered with innovation.

Alongside the use of innovative technologies – including machine learning, drones, multispectral imagery and eDNA kits, we've adopted a new business model focused on core stakeholders aiming for a sustainable, nature-positive exploration and exploitation of natural resources.

This work describes the application of biodiversity assessment – identifying hotspots, endangered species, and vulnerable ecosystems -- in multiple mineral projects in Angola as part of the exploration-up-to-closure economic geology toolkit. Rather than just finding, evaluating, and mining mineral resources, the focus of our approach is on social and natural systems – simultaneously exploring for, e.g., superdeep Type II diamond mineralization in kimberlite and alluvial deposits, copper in the Angolan side of the Copperbelt, or REE in carbonatites, sources of renewable energy, biological resources, and archaeological sites.

This approach allows mineral companies to plan their activities with a better knowledge of the local social and natural systems, define impact metrics, and report to society under ESG-compliant standards, namely, PERC, TFND and others.