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A Preliminary Overview of the Metallogenic Provinces of Southern Angola

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Abstract

The distinct mineralisations found in the Republic of Angola make it an area of significant interest due to its metallogenic potential. These occurrences often have a spatial distribution and form mineral associations related to specific geological areas and environments. However, given the growing global demand for mineral resources, it is crucial to comprehend a country's regional mining potential. This knowledge is essential for effective territorial planning and future exploration and research of its resources. For this reason, the Government of the Republic of Angola, through the Ministry of Natural Resources, Oil and Gas (MIREMPET) and the Geological Institute of Angola (IGEO), implemented the National Geological Plan of Angola (PLANAGEO, 2014-2022). The main aim of PLANAGEO was to establish a detailed and comprehensive geological framework, facilitating a thorough interpretation of the identified geophysical and geochemical anomalies, as well as the geological processes responsible for the recognised mineralisations.

The UTE PLANAGEO consortium, comprising the Geological and Mining Institute of Spain (IGME), the National Laboratory of Energy and Geology of Portugal (LNEG), and the Spanish company Impulso Industrial Alternativo (IIA), conducted numerous geological, geophysical, and geochemical mapping surveys in the southern region of the country, covering an area of around 480,000 km². One of the most important results of the project was the Metallogenic Map of Southern Angola at a scale of 1:1,000,000. This map provides a summary of the mineral resources of the country and proposes, for the first time, a preliminary approach to the distribution of metallogenic provinces in the southern region of Angola. These regions are characterised by mineral resources of potential interest, clearly defined and associated with a geological context, that may or may not be genetically related.

The southern region of Angola comprises five major metallogenic provinces, with metallogenic eras ranging from the Neoproterozoic to Cretaceous times: i) the metallogenic province of Au-Fe, mainly related to BIF-type deposits; ii) the metallogenic province of Cr-Ni-PGE, associated with distinct Proterozoic mafic to ultramafic bodies; iii) the polymetallic metallogenic province of the Kunene Complex (KC); iv) the metallogenic province of Cu, related to various hydrothermal

mineralisation events and the Copper Belt of the Lufilian Arc, covered by the Kalahari Basin; v) and the metallogenic province of Nb-Ta-REE, represented by Cretaceous alkaline-carbonatite structures and selected granite pegmatite fields.

Hence, this work presents an assessment of the metallogenetic potential of the southern region of the Republic of Angola, discussing the various mineral resources within a regional geological context. Although this work focuses on mineral resources that involve natural processes of concentration and/or whose deposits represent an anomaly in the crust, it also includes the potential interest for the exploration of industrial rocks and minerals and ornamental rocks. The primary aim of the metallogenetic map is to offer fundamental knowledge for future mining research planning and to promote the socio-economic development of the country based on the sustainable use of its natural resources. This will favour intra- and inter-community trade relations and have a direct benefit on the economic development of the country.

Keyword

Metallogeny, Mineral resources, Metallogenetic provinces, Angola, PLANAGEO