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## The Mesoproterozoic East African Nickel Belt

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Nickel production in Africa takes place principally in Botswana, South Africa and Zimbabwe, with much of the South African and Zimbabwean production being a by-product of platinum-group element mining in the Bushveld Complex and Great Dyke. Several large nickel deposits have been discovered elsewhere in Africa but until recently, their development has been hindered by political risk and limitations in energy and transport infrastructure. Most of the continent is significantly underexplored with respect to base metals, including the area (Fig. 1) covered by the East African Nickel Belt (EANB).

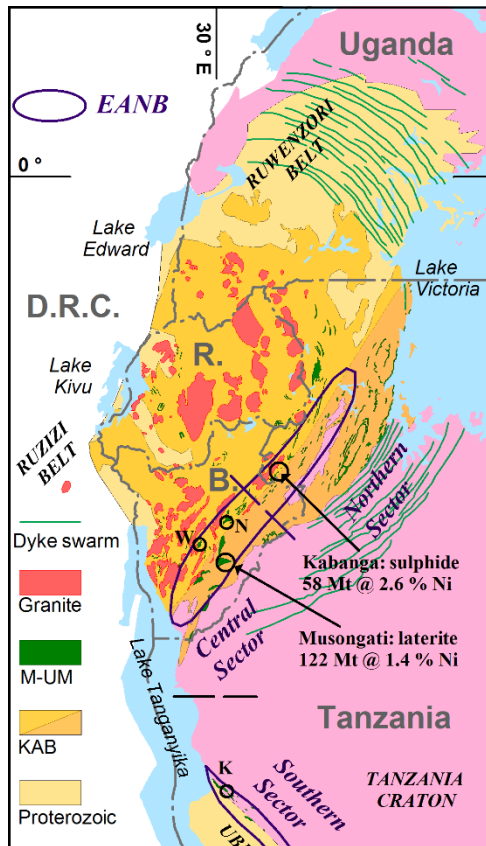


Figure 1: Geological sketch map with location of the EANB (B. – Burundi; R. – Rwanda)

Smaller and lower grade laterite deposits are also known at Nyabikere (N) and Waga (W: Central Sector) and at Kapalagulu (K: Southern Sector, Fig. 1)

The known nickel deposits of the EANB all occur in mafic-ultramafic (M-UM) intrusive rocks of the Mesoproterozoic-age Kibaran igneous event that have been intruded into metasedimentary rocks of the Karagwe-Ankole Belt (KAB, Fig. 1). These intrusive bodies take the form of medium to large layered intrusions and small dynamic magma conduits (chonoliths and sills). Nickel laterite deposits are developed over exposed dunite and peridotite lithologies in the basal sequence of larger layered intrusions, whereas nickel sulphide deposits are developed at the base of the small chonoliths. Geochronological and geochemical data suggests that all intrusions in the EANB formed in a single magmatic event (1350 to 1400 Ma) and were derived from a picritic parental magma, which was variably contaminated in mid to upper-crustal staging chambers by metasedimentary and other rocks [1]. As a result, nickel sulphide mineralization with a wide variety of compositional and textural types was formed in all the ultramafic-bearing intrusions. In most of these, the grades or tonnages are too low to be considered economic in the foreseeable future, however, in a few cases, both grades and tonnages are sufficiently high to be of economic interest.

In the 1970s, government-led regional surveys identified a large nickel laterite deposit at Musongati in Burundi and a nickel sulphide deposit at Kabanga in north-western Tanzania (Fig. 1). These deposits have subsequently been explored and delineated by mining companies resulting in the current mineral resources stated in Fig. 1.

The deposits of the EANB remain undeveloped due to their distance to the coast and a lack of transport and energy infrastructure at present. The governments of Burundi and Tanzania are committed to improving infrastructure links via a 500 km long railway extension [2].

*References:*

[1] Maier W D et al. (2010) *Min Deposita* 45(5): 419-441

[2] Oirere S (2015) *Int Railway Journal* online, July 23, 2015

