The Metallogenesis of the Orogenic Gold Fields in the Karagwe-Ankole Belt in Central Africa:" a Systematic Review of the Current Understanding"

Rub'son H. N'nahano[1], Huan Li[1], Moise Luemba[2], Claude Nambaje[3]
1. Central South University, School of Geosciences and Info-Physics, Department of Geological Engineering and Geological Resources, Changsha, Hunan, China, 2. China University of Petroleum,School of Geosciences,Changjiang West Road, 66 Hungdao District, Qingdao, Shandong, 266580, China, Qingdao, China, 3. Indian Institute of Science, Centre for Earth Sciences, Bangalore 560012, Bangalore, BR, India

The gold metallogenic evolution of Central Africa has not been fully investigated in detail despite its huge reserves and a long mining history that has gone over a century. Most of the gold deposits of the main Kibara belt, known as the Karagwe Ankole Belt in some literature, are located in the eastern part of the DR Congo, named the Twangiza-Namoya Gold Belt (TNGB). These orogenic gold deposits are found in Proterozoic, Mesoproterozoic, and Neoproterozoic geological terranes. The variability of ore fluid genesis with regard to the complexity of the geological formations records makes the Central Africa's magmatic-hydrothermal systems challenging compared to the other orogenic gold world fields. Adding to that, the lack of knowledge of the particular hydrothermal processes that were involved in carrying and depositing the gold mineralization during the entire Precambrian era is making the region scientifically undiscovered in the field of economic geology. This work reviewed the systematic fluid inclusions, sulphur and boron isotope studies done in the region with the purpose of getting the preconception of the gold metallogenic model of the Karagwe-Ankole Belt (KAB). The gold deposits in the KAB are being supplied by fluids derived from sedimentary formations. Although some fluids are proved to be of magmatic and/or metamorphic origin, the most influential fluids are derived from sedimentary origins occurred during the greenschist facies metamorphism. Two types of gold bearing fluids have been constrained: the gold bearing fluid derived from the crystallization of the regional G4 specialized granites associated with the endowment of Nb-Ta-Sn mineralization and the ore fluids associated with the main fluid activity occurring during the early Pan-African orogen. This article concludes on the future research investigation that has to be done regarding the H-O-C-S and Cl systematic isotopes of each single deposit in the Karagwe Ankole Belt.