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CENTRAL TANZANIAN TECTONIC MAP (CTTM): A STEP FORWARD TO DECIPHER PRE PAN-AFRICAN AND PAN-AFRICAN STRUCTURAL EVENTS

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From Central Tanzania, between Dodoma (west) and Morogoro (east), Nguru Mountains (north) and Mahenge Mountains (south), we compiled a simplified structural map using published geological maps and own observation. We defined 6 domains characterized by distinctly different structural imprint and different age domains. These domains are (1) Tanzanian Craton, (2) Konse Group, (3) Usagaran Eclogite Zone, (4) Usagaran Magmatic Belt, (5) Ruaha domain and (6) Eastern Granulites. From these domains a study on metamorphic conditions and rheology of the main rock forming minerals (quartz, feldspar, amphibole, pyroxene) was performed. Combining these data with succession of structural events and available geochronological data we present a model on pre Pan-African and Pan-African tectonothermal events.

The overall geometry of both, the pre Pan-African and Pan-African events is governed by the shape of the Archean Tanzanian Craton. The Craton behaved as a passive indenter. During general W-E convergence the N-S trending Craton margin accumulated orthogonal compressional structures, along the W-E trending margin strike-slip and extension occurred. (1) The pre Pan-African convergence resulted in eclogite formation on the compressional side of the Craton margin and approximately coeval emplacement of granitoids and island arc volcanics on the extensional side. The penetrative fabric of high grade gneisses within domains 3,4 predates emplacement of ca. 1.8 Ma old granitoids. Decompression fabrics from granulite facies Usagaran rocks suggest a clockwise P-T history. (2) The Pan-African convergence (from ca. 640 Ma onward) resulted in flat lying, westward directed thrusts on the compressional side and strike-slip tectonics with arcuate structures and wrench zones on the extensional side. Rheology variations suggest forward propagation of thrusts with emplacement from deeper crustal levels in the east. All units are effected, but deformation intensity decreases strongly from East (Eastern Granulites) to West (Craton Margin). Within the Ruaha domain isothermal decompression from granulite facies is observed. (3) The distribution of the Eastern Granulites mimics the shape of the indenter but internal structures and P-T evolution differs. North - south extensional features and NE trending strike-slip shear zones developed. Almost isobaric cooling is dominantly observed.

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