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## Sedimentary basins of Botswana

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Geological and mineral exploration investigations across the geological spectrum in Botswana have revealed the occurrence of major sedimentary sequences that represent episodes of sedimentation [1]. Sedimentation and preservation of sedimentary rocks can be traced back from the Archaean through to the recent Kalahari Desert environment. Most of these sedimentary rocks are preserved in basins of intracontinental sag and rift settings.

Neoarchaeal volcano-sedimentary and siliciclastic sequences of the Nnwywane Formation and Mogobane Formation, respectively, form a category of pre-Transvaal basins that occur in laterally restricted basins developed in southeast Botswana [6]. These basins developed during extensional tectonics linked to the Limpopo Orogeny [2]. The pre-Transvaal basins of southeast Botswana have age-equivalents in South Africa where they are correlated with the Derdepoort and Tshwene-tshwene belts [3].

The pre-Transvaal basins were succeeded by the development of a major laterally extensive Transvaal basin whose main outcrop is in South Africa. The Transvaal basin accumulated Neoarchaeal to Palaeoproterozoic Transvaal Supergroup sequences dominated by siliciclastic and carbonate facies. The Transvaal Supergroup basins developed in response to prolonged subsidence that followed extensional tectonics during the on-set of the pre-Transvaal basins [3].

The Transvaal basins were succeeded during the Palaeoproterozoic by red bed sequences of the Otse, Waterberg, and Palapye groups that crop-out in eastern Botswana. The tectogenesis and relationships between these red bed sequences are little understood. The Otse and Waterberg groups occur in basins confined to the south of the Zoetfontein Fault whereas the Palapye Group is restricted to the north.

Sedimentary basin development continued with the formation of the Ghanzi-Chobe basin that consists of a linear belt of volcano-sedimentary sequences in northwestern Botswana [8]. The Ghanzi-Chobe sequences were deposited during Meso-Neoproterozoic times following extensional tectonics associated with the Namaqua-Natal orogeny [5]. The Ghanzi-Chobe basin

was subsequently deformed into a fold and thrust belt during the Pan African Damara Orogeny.

The Damara Orogeny also gave rise to a foreland Nama basin in the south wherein the dominantly siliciclastic Nama Supergroup rocks were accumulated during Neoproterozoic to Phanerozoic times.

The last major episode of ancient sedimentary basin development is represented by the Kalahari Karoo basin wherein is preserved sequences of the Karoo Supergroup. The Kalahari Karoo basin occupies much of central Botswana where it defines an intracratonic sag basin although the eastern margin indicates a fault-bounded graben system [4].

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