GEOMORPHOLOGICAL DEVELOPMENT OF THE SCNP

Desert landscape evolution is mainly about formation and extension of pediments, to end in pediplains – low gradient and relatively featureless plains. Thus, the geomorphological development of the SCNP is described by Watson and Lemon (1985) as cyclic pediplanation of the series of land surfaces that were originally suggested by King (1962), namely Gondwana (Jurassic age), post-Gondwana (Cretateous), African (Early Tertiary), Post-African (Late Tertiary) and Congo/Zaire (Quaternary {Pleistocene}, Holocene and Recent). Each new cycle cut into features of its predecessor. A series of step-like erosional surfaces (platforms) formed, with the highest being the oldest. The current coastal platform represents the Congo Land Surface of late Cenozoic age.

Pediplanation starts with vertical (epeirogenic[1]) uplift of the land, followed by erosion of the steep margins of the landmass through both sheet flooding and lateral erosion by streams. As mountain fronts erode, their cliff faces and the steep wash slopes below retreat in a process known as backwasting. At the same time, a relatively thin layer of material from eroding uplands is deposited, mainly by laminar sheet flow of water, over bedrock on the gentle toe-slopes. As a result, these pediments at the bases of receding escarpments grow at the expense of the mountain fronts.

The Great Escarpment lies to the east of the Namib Platform and separates it from a mountainous hinterland at ± 900–1,300 m height (Partridge and Maud, 2000). The Great Escarpment is a result of continental uplift and denudation following the break-up of Gondwana and opening of the South Atlantic during the early Cretaceous. Weathering-resistant rocks of the Precambrian Damara Sequence of the Escarpment, for instance quartzites, form outliers jutting into the coastal plain and had in some places been eroded to inselbergs. Pediments extend from mountain foot slopes towards the coastal plain. These are gently sloping erosional landforms consisting of bedrock with a relatively thin covering of alluvial and/or colluvial material.

The northern Namib coastal plain's elevation varies from sea level to about 600 m, and the width between 30 and 50 km, with a very gentle slope of 1-2^{o}. The landform pattern is largely determined by exposed bedrock aligned more or less parallel to the coastline. This fold belt is the remnant of plate-tectonic compression during Late-Palaeozoic assembly of Pangaea and subsequent distortion during its breakup. The northern part consists of roughly bevelled bedrock in which mechanical weathering is controlled by the geological structure and rock type. It is partly exposed and partly covered by dunes, sand sheets, sand streaks, river terrace deposits, thin sands and gravels.

The coastal strip is characterised by sand-, gravel- and pebble beaches, exposed bedrock, rocky headlands, short northerly-extended sand spits and raised beach terraces. It shows the influence of Pleistocene and earlier sea level changes: six marine transgressions had been identified along the southern Namibian coast.

Intrusive granites form inselbergs on the coastal plain – either as broad, low exfoliated domes or jointed castle koppies known as *tors*.

Geomorphic and soil-forming processes in arid environments differ substantially from those in zones that are more humid. Streamflow is irregular, intermittent, ephemeral and often endorheic – ending in inland depressions, viz. playas and salinas (salt pans). Chemical weathering is inhibited by absence of moisture, so physical weathering processes dominate. Unconfined sheet floods and mass wasting are the primary erosional processes, more even than aeolian processes.

[1] Epeirogenic movements refers to slow uplift / upwarp of large, stable interior blocks of continents (cratons), causing little deformation of fracturing. It is in contrast to orogenic movements at plate margins caused by compressional or tensional forces that result in intense folding, thrusting, faulting and uplift of narrow belts

SOURCES

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