GEOLOGICAL ASSESSMENT OF BASEMENT ROCKS VARIABILITY TO WEATHERING AND ITS LANDSCAPE ASSESSMENT IN ZUNGERU AREA NORTHWESTERN NIGERIA

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ABSTRACT

In the north-eastern area of Zungeru, it is common to find extensive areas with few, if any fresh rock outcrops. Among potentials impact of geology and deep weathered rock land features includes pollution of surface and underground water, farm land degradation by which fertile land becomes unproductive for agriculture practice, loss of vegetation cover that may promote surface run-off and erosion and destruction of geologic column. There are three basic types of weathering profile, type A which is characterised by thorough disaggregation and with a gradual downward increase in coherence to hard rock, these profiles are typically associated with coarse-grained granites and other homogeneous or closely fractured rock types, type B is characterized by upper zone of thorough disaggregation and a lower zone of core stone development and common with mostly widely jointed acid and basic igneous rocks, type C characteristic of weathered metamorphic rocks in particular meta-sedimentary rocks that developed break up angular blocks base profile an separated by thin seams of decomposed rock. This paper is aimed at combining geology and geochemistry of rocks to evaluate the influence and extent of weathering and land degradation in parts of Zungeru. The basement rocks in the study are falls within the Ushama and BirninGwari formations and make a gradational contact with the sedimentary rock of Bida sandstone formation. Geological mapping by traverse method using topographic base map on a scale of 1:50,000 was carried out. Depth of the gullies where measured from the surface using measuring tape. Geochemical analytical method employed is ICPMS. Geochemical plots and weathering indices suggest extreme weathering for phyllite and muscovite schist, intermediate weathering for biotite schist and low weathering for granite gneiss and amphibole schist. Identification of localized and regional weathering zones with deep weathered profile in north-west of Zungeru suggested that weathering is most distributed in areas of low grade meta-sedimentary rocks of mica schist and phyllite. Landscape pattern and frequency varies with rock types and ranges from between of 5 to 50 meters surface extend of about 120 meters in areas with phyllite and muscovite schist, rock weathering intensity in the area is highly influenced by climate, topography and intensive land over cultivation in the area. Crop rotation and bush fallowing system of farming is suggested while cultivation of deep root crops should be minimized.