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Assessment the spatial and temporary variability of sediments production taken into account the land use and the climate change, In the Paute river basin southern Ecuador

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Erosion processes and sediment production data for The Paute river basin watershed (5000 km2) located the south of Ecuador, are analyzed, its importance is in the hydroelectric sector in which the project generates 1200 Mw and that correspond approximately to 55% of the energy for the Ecuador. The anthropogenic intervention, the watershed geomorphologic characteristics, added to the great variability of present land use and to the non-uniform space and temporary distribution of the hydrologic events; contribute to the permanence of the erosive processes of formation of gullies, progressive degradation of land cover that is translated in a constant production of sediments. According to the load of suspended sediment monitoring campaign, values like 90% of the total production would occur during the rainy time and in very little number of variable intensities events, from this data, between 40% to 50% show values up to 25 mm h-1. Therefore it has been taken as an important criterion the Rain fall regime and the annual sediment production. Considering the later results, a scheme for projection of rates of erosion and sediment production has been settled down taken into account factors as: Regime and annual Rainfall average; Land cover type and its surface, and Space zoning of vulnerable areas.

According to the degraded areas assessment and considering the current rainfall conditions regime and its land cover, and the available evidence with respect to the influence of the presence or absence of a good forest cover on rainfall it was settled down rates of erosion for the regional projection four main zones with the following ranks of annual erosion: i) natural zones < 5 t ha-1 a-1, II) zones of anthropogenic intervention from 5 to 50 t ha-1 a-1, III) zones of moderate erosion from 50 to 100 t has-1 a-1, and IV) high rates erosion zones > 100 t ha-1 a-1.

Starting on 2010 is operating Mazar reservoir in the retention of sediments as support to Amaluza reservoir and therefore beneficial to increase the useful life of the dam that at the present time. The aim of the present paper is to establish if the impact of the processes of erosion and sedimentation in the Paute river basin would have direct consequences in the hydroelectric production and useful life of the dams; a scenario analysis of erosion processes with respect to main works of water retention for hydroelectrically production of the zone was done, the temporary scale of the analysis of sediments has been considered from year 2010 to year 2030; Using ECHAM A2 and the ECHAM B2 climate change scenarios.