

Land use land cover change and its effect on the hydrological regime of a Himalayan Watershed

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In recent decades on planet earth people of the world by and large have been persistently ignoring the signs of environmental degradation which have by now reached crisis proportions. It is now clearly understood that the well being of Mother Earth depends on the preservation and sustenance of the environment. The increasing human interference with the natural environment, due to economic and social pressures, has resulted in inadequate land management; intensive changes in recent years of the land use and land cover patterns. Those practices, besides the natural setting and environmental characteristics of the Kashmir Valley; resulted as the major contributors to the development of the land degradation processes. In the Lidder catchment land use/land cover classification and change detection analysis was carried out for the LANDSAT images of 1979, 1992 and 2002. The CLUE-S model was used to generate two land use/land cover scenarios for the year 2020 based on the driving factors; elevation, slope, population density, soil, distances to rivers and towns and lithology. The outputs of CLUE-S model for the considered scenarios show a large increase in horticulture and settlement and a decrease in agricultural, fallow and plantation land classes. As observed from the average annual soil loss maps of 2002, 1992 and 2020 land use/land cover and 1983-2003 climate simulated by the SWAT, showed that moderate (4.5-15t ha⁻¹) to high (>15t ha⁻¹) soil losses were produced by catchment sections 6, 7 and 8 respectively while the lowest (<4.5t ha⁻¹) soil losses were produced by 1, 2, 3, 4 and 5 sections. This analysis has clearly shown the strong effect that LULC change, and especially agricultural land use, has had on the hydrological regime of the Lidder catchment.