

- 1082. Sharda, V.N. and Patnaik, U.S. 1995.** Morphological characterization of Shiwalik and outer Himalayan torrential watersheds. In: *Torrent Menace: Challenges and Opportunities* (Eds.) G.Sastry, V.N.Sharda, G.P.Juyal and J.S.Samra, CSWCRTI, Dehradun: 273-282.

The behaviour and mechanics of torrents originating from Shiwaliks and outer Himalayas has been critically examined through quantitative morphometric analysis. Himalayan watersheds are feather shaped and less compact than the Shiwalik watersheds. The higher values of relief ratio and average slope results in higher torrential flow in Shiwalik watersheds thereby suggesting effective soil and water conservation measures. The ruggedness number does not vary significantly and is found to be below 1 indicating equilibrium or mature stage of development in all the watersheds. Due to predominance of first order streams in Shiwalik watersheds, water flows quicker than outer Himalayan watersheds resulting in high peak discharges. From the relative drainage density curves, it is inferred that in all the watersheds the upper 10-20% of the area need to be treated to prevent extension of torrents and in the lower 40-45% of the area, soil conservation measures must be taken up to prevent encroachment of the adjoining lands. The hypsometric analysis indicates that though all the watersheds are in equilibrium stage, the Shiwalik watersheds approach the Monadnach phase due to distortion of hypsometric curves which is attributed to the presence of isolated patches of resistant rocks. About 15-20% area of outer Himalayan watersheds in the upper reaches has been found to be under abrupt elevation fall compared to 20 to 30% in the Shiwalik watersheds confirming the steeply sloping nature of the latter ones.