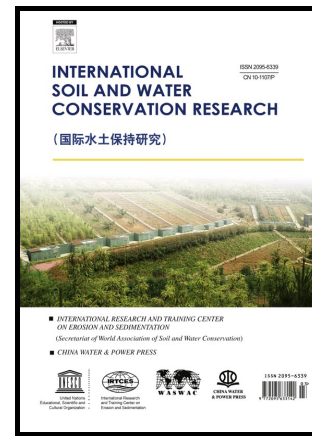


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**Estimation of soil erosion in a rain shadow river basin in the southern Western Ghats, India using RUSLE and transport limited sediment delivery function**

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**Abstract**

Soil erosion and deposition in a tropical mountainous river basin, viz., Pambar River Basin (PRB), in a rain shadow region of the southern Western Ghats (India) were modelled using Revised Universal Soil Loss Equation (RUSLE) and transport limited sediment delivery (TLSD) function in GIS. Mean gross soil erosion in the basin is  $11.70 \text{ t ha}^{-1} \text{ yr}^{-1}$ , and is comparable with the results of previous soil erosion studies from the region. However, mean net soil erosion from the basin is  $2.92 \text{ t ha}^{-1} \text{ yr}^{-1}$  only, which is roughly 25% of the gross soil erosion. Although natural vegetation belts show relatively higher gross- and net-soil erosion rates (mainly due to high LS and C factors), their sediment transport efficiency is remarkably less, compared to the land use/ land cover types with anthropogenic signatures (i.e., plantations and croplands). Despite the lesser amount of annual rainfall, the high rates of soil loss from the semi-arid areas of the basin might be the result of the poor protective vegetation cover as well as isolated high intensity rainfall events. The study highlights the significance of climate-specific plans for soil erosion management and conservation of the soil resources of the basins developed in rain shadow regions.

**Key words:** Soil erosion, RUSLE, Transport limited sediment delivery, Rain shadow region, Pambar River Basin, Western Ghats

**1. Introduction**

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