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Changes in vegetation cover and soil erosion in a forest watershed on removal of weed *Lantana camara* in lower Shivalik region of Himalayas

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ABSTRACT

In a hilly forest watershed located in lower Shivalik region, the invasion of *Lantana camara* weed resulted in a drastic reduction in plant biodiversity and ground cover, thereby increasing the rate of soil erosion. In order to reduce soil erosion and restore biodiversity, Lantana was removed from four micro-watersheds (WS₁, WS₂, WS₃, and WS₅) in year 2005. The changes in soil erosion and vegetation cover area in the ground storey (grasses + small shrubs) and middle storey (shrubs) were monitored in top, middle and lower reaches of four micro watersheds during the period 2005-2010 and were compared with a pure grass watershed (WS₄) located in the same watershed. Due to Lantana removal, the canopy cover of Lantana reduced from 80-90% in 2005 to 5-10% in 2009, resulting in better light penetration and improvement in ground cover vegetation of native grasses like *Eulaliopsis binata*, *Chrysopogon fulvus*, seasonal grasses, and native shrubs like *Adhatoda vasica*, *Murraya koenigii*. There was a reduction in soil loss in all the watersheds in 2010, which was found directly related to the ground cover improvement, mainly in the top reaches of micro-watersheds. It is concluded that the ground vegetation cover plays a major role in soil erosion and its reduction due to of *Lantana camara* invasion has a direct impact on hydrological behavior of the watershed. The removal of this weed can restore ground vegetation thereby reducing soil erosion.

Key words: Forest watershed, *Lantana camara*, Lower Himalayas, Run off, Shivaliks, Soil erosion, Soil loss, Vegetation cover