



## **Evolution and erosion rate of Holocene ravines in the Marginal Ganga Plain, India**

Rupa Ghosh (1,2), Pradeep Srivastava (1), and Uma Kant Shukla (2)

(1) Wadia Institute of Himalayan Geology, Dehradun, India, 248001. (rupaghosh2006@gmail.com), (2) Department of Geology, Banaras Hindu University, Varanasi-221005

Ravine formation and soil erosion has been matter of concern to agriculturist economies. Understanding the processes of ravine formation and proper estimates of Specific Sediment Yields (SSY) of such area might help in formulating mitigation policies significantly. So far, in the Ganga Plain, the work done on ravine formation and erosion and SSY estimates have been speculative and rather ambiguous. Here using (i) high resolution Digital Elevation Models (DEMs) prepared from Real Time Kinematic (RTK) survey of ravined zones and CARTOSAT images (ii) luminescence chronology, we provide the first digital estimates of SSY from the ravines. The results indicate specific sediment yield (SSY) in the Marginal Ganga Plain (MGP) ranges between  $600 \pm 100$  t/km<sup>2</sup>/yr and  $1600 \pm 200$  t/km<sup>2</sup>/yr. The regional correspondence relation of fracture orientation with first order ravine orientation suggests that ravine growth is genetically related to extensional stress regime of the peripheral forebulge. Further, the clay sedimentology indicates that besides regional tectonics, action of swelling clays may have accelerated development of the badlands.