Shyam Kanhaiya
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Response of the River Jhelum to Active Tectonics, NW Himalaya

Reyaz Ahmad Dar, Yasir Manhas, Khalid Omar Murtaza, Waseem Qader, Jehangeer Ahmad Mir, and Omar Jaan Paul

1 Introduction

Alluvial rivers flow on the sediments deposited by them and are sensitive to slight changes in geomorphic, tectonic, and anthropogenic processes occurring within the basin (Achyuthan, 2003; Joshi & Kotlia, 2014, 2018; Kale et al., 2014; Kothyari et al., 2016a; Dubey et al., 2017; Dar et al., 2019). In view of their sensitivity and quick response to various disturbing processes, alluvial rivers provide a vital opportunity to comprehend the tectonic deformation of an area (Seeber & Gornitz, 1983; Ouchi, 1985; Holbrook & Schumm, 1999; Jain & Sinha, 2005; Turowski et al., 2006; Amos & Burbank, 2007). The response of alluvial rivers to active tectonics can be inferred from varied channel dimensions, including channel sinuosity, channel avulsions, aggradation, and degradation (Willett & Brandon, 2002). According to Schumm et al. (2000) any deformation on a scale of few millimeters (2–3 mm annually) may induce morphological changes in a river basin. Besides, climate, lithology, folding, faulting, incision, etc., can result in the formation of various channel patterns and alluvial landforms (Schumm, 1986; Keller & Pinter, 1996; Whipple et al., 2013; Kothyari, 2014; Kothyari et al., 2016b, 2018; Taloor et al., 2017).

The Kashmir Valley located in the NW Himalaya is sandwiched between the Great Himalayan Range to the northeast and Pir Panjal Range to the southwest (Fig. 1). The geomorphic setting of the valley suggests that due to the tectonic uplift of the Pir Panjal Range, the ancient drainage got impounded and formed a vast lake (Dar et al., 2014; Paul et al., 2021). This lake, known as Karewa Lake, later on

R. A. Dar (✉) · Y. Manhas · W. Qader · J. A. Mir · O. J. Paul
Department of Earth Sciences, University of Kashmir, Srinagar, India

K. O. Murtaza
Department of Geoinformatics, University of Kashmir, Srinagar, India

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