Title:	Geomorphic investigation of the Late-Quaternary landforms in the southern Zanskar Valley, NW Himalaya
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Abstract:	The Suru, Doda and Zanskar river valleys in the semi-arid region of Southern Zanskar Ranges (SZR) preserve a rich repository of the glacial and fluvial landforms, alluvial fans, and lacustrine deposits. Based on detailed field observations, geomorphic mapping and limited optical ages, we suggest four glaciations of decreasing magnitude in the SZR. The oldest Southern Zanskar Glaciation Stage (SZS-4) is inferred from glacially polished bedrock and tillite pinnacles. The SZS-4 is ascribed to the Marine Isotopic Stage (MIS)-4/3. The subsequent SZS-3 is represented by obliterated and dissected moraines, and is assigned to MIS-2/Last Glacial Maximum. The multiple recessional moraines of SZS-2 glaciation are assigned the early to mid Holocene age whereas, the youngest SZS-1 moraines were deposited during the Little Ice Age. We suggest that during the SZS-2 glaciation, the Drang-Drung glacier shifted its course from Suru Valley (west) to the Doda Valley (east). The study area has preserved three generations of outwash gravel terraces, which broadly correlate with the phases of deglaciation associated with SZS-3, 2, and 1. The alluvial fan aggradation, lacustrine sedimentation, and loess deposition occurred during the mid-to-late Holocene. We suggest that glaciation was driven by a combination of the mid-latitude westerlies and the Indian Summer Monsoon during periods of cooler temperature, while phases of deglaciation occurred during enhanced temperature.
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