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REVIEWER'S REPORT

Manuscript No.: **IJAR-53122** Date: 06-08-2025

Title: QUATERNARY TERRACES OF DIFFERENT DOMAINS OF ALAKNANDA & ITS TRIBUTATIES, BEHAVIOUR OF STATISTICALCAL PARAMETERS DOWN THE CURRENT IN BADRINATH _RESHIKESH SECTION, GARHWAL HIMALAYA, UTTTRAKHAND STATE INDIA

Recommendation:
Accept as it is .....YES.....
Accept after minor revision.....
Accept after major revision .....
Do not accept (*Reasons below*) .....

Rating	Excel.	Good	Fair	Poor
Originality			✓	
Techn. Quality		✓		
Clarity			✓	
Significance		✓		

Reviewer Name: Mir Tanveer

Reviewer's Comment for Publication.

Abstract

The abstract provides a comprehensive geological and geomorphological overview of the Alaknanda and Bhagirathi valleys within the Upper Ganga basin. It specifies the geographical scope, including districts such as Uttarkashi, Chamoli, Pauri, and Tehri, and references topographic sheets (53J and 53N) at a 1:50,000 scale. The focus on sedimentological characteristics and terrace distribution across multiple tributaries is clearly articulated. The mention of the Alaknanda as the trunk stream and its comparison with tributaries establishes the hierarchy within the drainage system.

The description includes detailed geological information on rock units—Central Crystalline, Garhwal Group, and Dudatoli Group—and their structural configuration with reference to thrusts, faults, and tectonic deformation phases. The explanation of lithological characteristics, structural features, and intrusive activity indicates the complexity of the study area. The link

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between tectonic structures such as the Alaknanda fault and terrace alignment adds an important geomorphic dimension. The discussion of stratigraphic equivalences between Alaknanda and Bhagirathi valleys further strengthens the comparative geological analysis.

Geographical and Geological Context

The abstract highlights the geological diversity of the study area, noting the distribution of crystalline rocks, schists, quartzites, and phyllites, and their stratigraphic relationships. The identification of major tectonic elements, such as the Main Central Thrust, north Almora Thrust, and associated strike-slip fault systems, demonstrates the significance of structural controls on landscape development. The reference to synclines and anticlines (Marithanasa, Pingapani, and Karanprayag structures) indicates detailed structural interpretation.

Sedimentological and Geomorphological Focus

The terrace distribution across different tributaries—six terraces in Alaknanda, five in Bhagirathi, and progressively fewer in smaller tributaries—illustrates the longitudinal and hierarchical variation in fluvial processes. The emphasis on terrace formation, alignment, and their correlation with tectonic activity provides insight into the Quaternary geomorphology of the region. This aspect is crucial for understanding river dynamics and landscape evolution in the tectonically active Garhwal Himalaya.

Structural and Stratigraphic Detailing

The abstract meticulously identifies formations within the Garhwal and Dudatoli groups and correlates them with formations in the Bhagirathi valley (Rudraprayag, Lamri, Chamoli, Gawangarh, and Patrali formations). The discussion of intrusive events—biotite granite, tourmaline granite, and basic intrusives—adds petrological detail to the geological framework. The segmentation of the Deoban Group into lower, middle, and upper formations with their respective lithologies indicates stratigraphic precision.

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Language and Style

The abstract employs highly technical language suited for a geological and geomorphological study. Terminology such as "strike-slip fault," "syncline," "thrust," "meta basics," and "greywackes" reflects academic rigor. The content is descriptive, with a strong emphasis on lithology, structure, and tectonic interpretation. It aligns with the conventions of geoscientific writing, prioritizing detailed geological characterization.

Overall Assessment

The abstract provides a dense and comprehensive synthesis of geomorphic, sedimentological, and structural aspects of the Alaknanda and Bhagirathi valleys in the Garhwal Himalaya. It effectively integrates terrace morphology with tectonic and lithological frameworks, highlighting the interplay between geological structures and fluvial processes. The level of detail regarding rock units, structural elements, and terrace distribution indicates significant field-based research and regional geological expertise. The study holds strong relevance for understanding Quaternary landscape evolution, tectonic geomorphology, and sedimentary processes in a tectonically active Himalayan setting.
