

# **Architecture of Fold-Thrust assemblages of the Marwat-Khisor Ranges of the outer Himalayan Orogenic Belt of Pakistan**

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## **Abstract**

Marwat-Khisor Ranges as central part of the Trans-Indus Salt ranges of Pakistan describe an east-west to northeast trending fold-thrust belt. This belt depicts the structural style of the southern deformed fold thrust belt of the outer Himalaya that characterizes the mobile perimeters of the Kohat Plateau and Bannu Basin in the south. The prominent fold-thrust assemblages of the Khisor Range are the Paniala, Saiyiduwali, Mir Ali, and Khisor anticlines with a youngest major Khisor fore thrust which bordered the Khisor Range in the south. The Marwat Anticline reveals a macro scale single key structure of the Marwat Range. Fold structures of the Marwat-Khisor ranges are generally asymmetric, overturned and exhibit south facing geometry. Construction of balanced structural sections across this belt suggests that the structural style is thin-skinned and mostly comprised of fold-thrust assemblages. These structural elements are kinematically associated to a regional basal decollement located at the base of Jhelum Group rocks. The Marwat Anticline initially developed as low amplitude forced fold that with the course of time displaced over an unexposed fault ramp to form a fault-bend fold. This episode was followed to the south by another thrust ramp from the basal decollement in the Khisor Range forming fault-bend anticlinal folds in the cover sequence. This ramp-flat trajectory from the basal decollement emerged in the form of Khisor thrust at surface juxtaposing Jhelum Group rocks against the Siwalik Group towards the Punjab Foreland. The Khisor thrust sheet defines the youngest deformation front of the outer Himalayan tectonic wedge in the Trans-Indus ranges.