

DRAINAGE ANALYSIS ALONG THE KALABAGH FAULT ZONE: IMPLICATIONS FOR NEOTECTONICS AND RECENT KINEMATIC HISTORY

Muhammad Noor Taj Khan^{1, 2}; and Sohail Wahid¹

¹ *National Centre of Excellence in Geology, University of Peshawar, Khyberpakhtunkhwa.*

² *Department of Geology, University of Swabi, Khyberpakhtunkhwa.*

noortaj20@gmail.com

Abstract

Drainage morphology of a region contains the recent history of landscape development. Quantitative measurements of morphological parameters of a drainage system can help in identification of the influence of tectonic or erosional processes in drainage evolution. Digital Elevation Model (DEM) of an area, which is the digitally stored remotely sensed spatial data, can be used to digitally measure and analyze the drainage morphology in digital environment. This geomorphometric information can be integrated with surface geology data for structural and tectonic interpretations. DEM data of 30 meters spatial resolution is used in this study to compute regional scale geomorphometric indices and ascertain the neotectonic signal, structural geometry and recent kinematic history of the Kalabagh fault zone. The following morphometric data and related indices are used in this study: 1) Stream network characteristics and associated indices. 2) Morphological characteristics of drainage basins. 3) Basin relief and associated indices. 4) Indices related to geometry, shape and regional tilting of drainage basins. Quantitative assessment of drainage morphology revealed that the studied fault zone is tectonically active and possess a younger drainage system which is developing under the influence of tectonic control. Differential thrust propagation along the frontal thrust zone of NW Himalayan Foreland is accommodated by development of a transfer zone. Strike-slip faulting and fold and thrust development along the fault zone is accommodating the active southward advancement of Potwar Plateau allochthon in a right lateral sense. Neotectonic activity along the Kalabagh fault zone points toward the concentration of active tectonic deformation in the laterally adjacent internal zone of the Potwar Plateau.