

## **Structural geology of Bagnotar area, District Abbottabad, Pakistan**

**Imran Khan<sup>1,2</sup>; Umar Khayyam<sup>3</sup>; Akif Aman<sup>4</sup>; Umair Aslam<sup>4</sup> and Muhammad Riaz<sup>5</sup>**

<sup>1</sup>*China University of Petroleum, Beijing, PR China*

<sup>2</sup>*COMSATS Institute of Information and Technology, Abbottabad, Pakistan*

<sup>3</sup>*Institutes of Geology, University of Azad Jammu & Kashmir*

<sup>4</sup>*Department of Geology, University of Peshawar, Pakistan*

<sup>5</sup>*National Centre of Excellence in Geology, University of Peshawar, Pakistan*  
*imrankhan@ciit.net.pk*

### **Abstract**

This study attempts to address the structural development and stratigraphic setup of a part of southeast Hazara Hill Ranges. These ranges are a part of the foothills of the western Himalaya. Present study deals with the detailed structural analysis of a portion of this range. Our study confirms the earlier discovery of major deformational events, that include the development of Geh Thrust Fault, which brought Pre-Cambrian sequences (Hazara slates and Tanawal Formation) over Mesozoic and younger platform rocks. This thrust fault is well exposed in the study area along Abbottabad-Nathiagali Road at Geh. In addition, Bagnotar Thrust, which significantly contributed to the deformation of the area, is also identified. Identification, documentation and subsequent analysis of structural features from the study area shows that the tectonic transport direction and stresses active in the area are mostly NW-SE directed. These structural features within the outcrop rocks are characterized by northeast trending folds and faults. The general trend of hinge lines of meso-scale folds observed is in northeast direction, implying southeast/northwest compressive stresses is accordance with the southward directed tectonic transport. The lineations and striations on the faulted surfaces indicate multi deformational events. The stratigraphy of the area has long been established, however, it is observed that the Pre-Cambrian sequences are not represented by Hazara Formation alone. We have been able to map alternating quartzite and phyllite units that resemble very closely the Tanawal Formation and it is now confirmed as Tanawal quartzite through petrographic studies. Thus the entire sequence is modified accordingly. It starts with Hazara Formation and Tanawal Formation at the base, overlain by the younger deposits of Mesozoic and Cenozoic age.