

# Revised stratigraphy and structural interpretations of a part of the Samana-Khyber Ranges, NW Pakistan

Muhammad Ashraf<sup>1</sup>; Waliullah Khattak<sup>2</sup> and M. Asif Khan<sup>3</sup>

<sup>1</sup>*Geological Survey of Pakistan, Islamabad*

<sup>2</sup>*Geological Survey of Pakistan, Quetta*

<sup>3</sup>*National Centre of Excellence in Geology, University of Peshawar*  
[mashraf73@yahoo.com](mailto:mashraf73@yahoo.com)

## Abstract

This study presents the first geological map on 1:50,000 scale of the southern margin of the Khyber Agency and covering part of the northeastern Orakzai Agency, Survey of Pakistan topographic sheet No 38 O/1. The area was previously mapped on 1:250,000 scale by Meissner et al. (1973) with the help of aerial photographs and limited field traverses. Meissner correlated the northern part of the quadrangle with the rocks of the Attock-Cherat range situated in the east of the mapped area. The Precambrian rocks, undivided Jurassic rocks with the unconformable and or faulted contact with overlying Miocene Murree formation and undivided Paleocene rocks in the vicinity of Bara River were mapped in the northern part of the quadrangle. In the southern part of the area along the Mastura River the Cretaceous rocks were shown over the undivided Jurassic rocks.

The stratigraphic setup of the area reinvestigated in this study highlights several differences from those of the previous workers. The area marks the junction between two tectonic blocks; Khyber block in the north and the Samana block in the south which is separated by Bazar thrust. The Khyber block in the mapped area consists of three major units including Shagai Formation, Khyber Limestone and Landikotal Slate of Pre-Cambrian age, with minor Carboniferous-Permian limestone in the NW part of the mapped area and some undifferentiated ?Jurassic-Cretaceous rocks in the eastern parts of the quadrangle.

The Samana block to the south consists of the Jurassic Samana Suk Formation and the Paleocene Hangu, Lockhart and Patala formations. Meissner et. al. (1973) mapped the same lithologies in the part of the presently studied area in the Samana block except for that they showed the presence of Cretaceous rocks at the southern along the banks of the Mastura River and also extended these lithologies (Cretaceous rocks) northeastwards towards the Bara River. In the present study, no Cretaceous rocks are found along the Mastura valley nor are these found to occupy the Isakai thrust. The Paleocene rocks in the Mastura Valley occupy the footwall of the Isakai thrust and form alternating shallow anticlines and synclines occupied respectively Palaeocene Hangu and Patala formations.

Major results of this study include:

1. The Bazar thrust separates the Precambrian-Paleozoic rocks in the north from the Mesozoic-Cenozoic rocks in the south. The Precambrian-Paleozoic rocks are not found south of this fault in the Samana Block.
2. The Precambrian formations exposed in the northern block in the Bazar-Chora valley of the map have been renamed.
3. The Bara River and the Mastura river valleys are occupied by the Paleocene rocks.
4. The Stratigraphy in southern Samana block has been revised. The Cretaceous rocks are not found in the Mastura River valley and Ukhodarra area and these are mapped as Palaeocene.