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Report

Field trip in the Kashmir Himalaya

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Abstract: This report contains short information about the geomorphological field trip in the Kashmir Himalaya. The guided trip program includes the following issues: the tectonic characteristics of the relief of the valleys, the sedimentation effects of the high-energy rivers, the mass movements, and the extent of the fluvioglacial and glacial forms, the wide river channel of a high-energy river covered in rock blocks, the genesis of the Kashmir Basin, the recession moraines, the wide braided channels of rivers, and the structure of the flood plain.

Key words: Sonamarg Valley, Pahalgam Valley, Shopian Valley, Wular Lake, Zanskar Himalaya, India

After the 9th International Conference on Geomorphology in New Delhi (November 6–11, 2017) organised by The International Association of Geomorphologists and the Indian Institute of Geomorphologists, 16 conference participants (Fig. 1) from 7 countries (Brazil, Germany, Israel, Poland, Romania, Russia, United States) took part in a 6-day (November 12–17, 2017) field trip B4 in the Kashmir Himalaya, Northern India (Fig. 2).

Fig. 1. Participants of the field trip in the Kashmir Himalaya, the Pahalgam Valley, 2 414 m a.s.l.

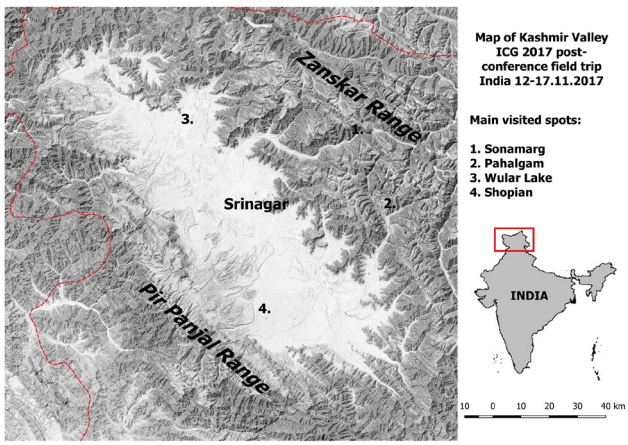

Fig. 2. Map of the Kashmir Basin. Places visited by the field trip participants are marked (1–4)
Red broken line shows the border between India and Pakistan.

The field trip was organised by Prof. M. Sultan Bhat and his co-workers from Department of Geography and Regional Development, University of Kashmir, Srinagar. After the flight from New Delhi and arrival at Srinagar participants in the field trip were taken to a lodging base at the Mannat Hotel. This was the starting point from where every day two buses took us to explore the Kashmir Basin and surrounding river valleys. At the beginning of our stay in Srinagar Prof. M. Sultan Bhat delivered a talk focused on the regional relief of the Kashmir Basin (Bhat 2017). The Kashmir region is an intramontane basin formed in the late Miocene surrounded by the Zanskar Himalaya in the north and east and the Pir Panjal Range in the south. Elevations range from 1 560 up to 5 550 m a.s.l. Some 5–4 Ma the Kashmir Basin was a place of low energy fluvio-lacustrine sediments (Karewa Formation). The Kashmir Basin is a tectonically active region with a complex pattern of faulting. Earthquakes are frequent and the last and most disastrous one was in October 2005 and brought more than 80 000 casualties.

The programme of the thematic trips was as follows:

Day 1: Srinagar – Sonamarg Valley – Machoi Glacier (Zanskar Himalaya). When making their stops on the way, the participants focused on the tectonic characteristics of the relief of the valleys, the sedimentation effects of the high-energy rivers (maximum fraction of 3 m) (Fig. 3), the mass movements, and the extent of the fluvioglacial and glacial forms. The participants in the field trip travelled the highest section of the valley (5 km) on horseback (Fig. 4), watching the morphology of the trough valley, with vast talus cones below the retreating glaciers (Fig. 5). The timberline seen on the slopes of the valley has a winding shape influenced mainly by snow avalanches. After reaching the forefield of the main glacier at 3 000 m a.s.l., the participants viewed a huge snow bridge where accumulated avalanche snow extended across the river (Fig. 6). There the field trip participants were treated to tea by shepherds. On the way back to the main road in the valley,

Fig. 3. Sediments of a high-energy Himalayan river

Fig. 4. Participants of the field trip in the Sonamarg Valley

Fig. 5. Relief of the uppermost part of the Sonamarg Valley

Fig. 6. Snow bridge in the Sonamarg Valley at the elevation of 3 000 m a.s.l.

recessional moraines and sedimentation effects could be seen in intermoraine depressions.

Day 2: Srinagar – Pahalgam Valley – Tchajwas Glacier (southern slope of the Zanskar Himalaya). The attention of the field trip participants was drawn to the wide river channel of a high-energy river covered in rock blocks with a diameter of over 3 m. The undercut slope showed a series of sediments known as the Karewa Formation with neotectonic deformations (Fig. 7). The observed landforms and sediments were discussed in the field.

Day 3: Srinagar – Wular Lake. The field trip participants discussed the genesis of the Kashmir Basin, with its largest lake, Wular Lake, as well as the origins of the silty sediments present around the lake.

Day 4: Srinagar – the Shopian Valley in the northern foreland of the Pir Panjal Range (4 743 m a.s.l.). The most interesting features included the recession moraines, the wide braided channels of rivers, and the structure of the flood plain at the spots where the river undercuts its banks. Particular interest was aroused by the extensive silty sediments in the Kashmir Basin, which were considered – as the organisers themselves declared – to be of limnic and not eolian origin.

Fig. 7. The Karewa Formation. Neotectonic deformations are visible

The field trip was rounded off with a summary discussion at the hotel in Srinagar. The field trip participants thanked the organisers, especially Professor M. Sultan Bhat, for their skilful organisation of the trips. The participants in the field trip expressed the view that there is a need to establish cooperation aimed at further geomorphological research in that part of the Himalayas.

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