



## Field Transect: NR003, Archives of Late Quaternary climate fluctuations in Satluj Valley, Himachal Pradesh

### Geological Significance:

- The Himalayas present a unique natural geographic setting on earth where both global and regional controls on climate can be studied. Quaternary and especially the late Quaternary has been the period of significant global climate fluctuations including Last Glacial Maxima (LGM), younger Dryas etc.
- This field traverse aims to demonstrate the regional influence of SW monsoon in the higher reaches of Himalayas with special reference to late Quaternary climatic archives in selected segments of Satluj and Baspa valleys.
- The Satluj river is a perennial river of Indus system which originates from Rakhas Tal and Mansarovar Lake in Tibet at an elevation of 4572m. After traversing through the Higher, Lesser and Outer Himalayan belts in Himachal Pradesh, it debouches on alluvial plain near Ropar in Punjab. Spiti and Baspa Rivers are its major tributaries. The river valleys exhibit 80 m to 400m high terraces from the present river bed. In Baspa valley, evidences of late Quaternary palaeoclimatic fluctuations are well preserved in palaeolake deposits formed due to damming of Baspa River. Beside alluvial fan, debris and land slide deposits have also dammed the valley at different elevations. The aggradation–degradation episodes vis a vis evolution of SW monsoon can be studied here.

### International Attraction:

- ✓ To unravel the climate and tectonic intricacies, the study of fluvio-lacustrine archives and dispersal mechanism of river systems along Himalayan river valleys attracted geoscientific community in last several decades.
- ✓ In the Satluj and its tributary stream (e.g. Baspa river valley), temporal and spatial distribution of valley fill deposits indicates variable modes of depositional processes that operated during major climatic fluxes (Indian Summer Monsoon dynamics and glacial-interglacial fluctuations).
- ✓ The sedimentological-geomorphological studies and OSL based absolute chronology of these landforms permits to demarcate major phases of valley aggradation/incision in Satluj and Baspa valleys in response of climate fluctuations; well correlatable with major glacial-interglacial periods.

Duration: 5 Days

Date of Excursion: Pre-Congress

Max.Participants:25

### GEOTOURIST SITES:



Himalayan Queen, Shimla, H.P.



Christ church, Shimla, H.P.

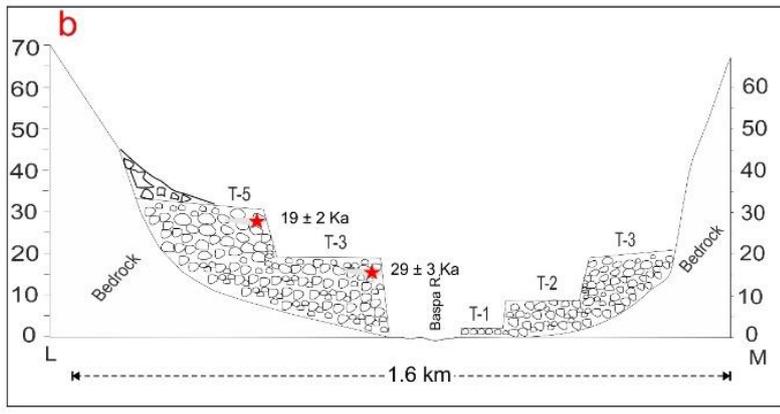


Narkanda, H.P.



Sangla Valley, Sangla, H.P.

## Geological Field Photographs:



(a) Staircase fluvial terrace at Chitkul Village. Note chaotic glacigenic debris spread over T-5 surface; (b) Cross section across Baspa River at Chitkul showing various terrace levels from present day Baspa River bed and OSL chronology.



Snout of hanging glacier near Chitkul. Such hanging snout debris are in metastable condition and liable to mass movement due to glacial retreat (warming)/ heavy precipitation (intensified monsoon events). This may cause river chocking of Baspa River and lake formation.



Yellow arrow shows feeder channel and dashed lines showing fan surfaces that might be responsible for localised reduction of River gradient and ponding in Bethal area, Satluj valley, H.P.

### GEOTOURIST SITES:

*The Himalayan Queen (toy train)* is the best mode of transport to explore the treasures of great Himalayas. The train has now come under the world heritage list of UNESCO and stands at fourth rank. It fascinates the visitors and there is no going back to their native places. The scenic beauty which starts from Kalka to Shimla is thrilling and wonderful throughout the route. The Kalka Shimla route is 96 km long, including 103 tunnels except for one which no longer exists.

*Christ Church* is one the oldest churches in North India and was built by the British in 1857. It is one of the long lasting legacies of British rule in India. The majestic appearance of the church and its stunning location makes it a prime attraction in Shimla. The church has stained glass windows, which represents faith, hope, charity, fortitude, patience, and humanity.

*Narkanda* is situated at an attitude of 2708 meters. The place offers a spectacular view of snow ranges. This is an ideal retreat for the tourists who seek seclusion in mountains. It commands a unique view of the eternal snow line, the inviting apple orchards and dense forests. Narkanda is famous for Skiing & Winter sports.

*Sangla Valley* is located in the Kinnaur district of Himachal Pradesh. It is one of the most beautiful valleys in the country surrounded by snow clad mountains. In Tibetan, the term Sangala means "pass of light" which refers to the valley receiving sunlight during the day.