The complex terrain of the Himalaya along with its glaciers is undergoing rapid changes due to changing climatic conditions. Remote sensing offers a vital tool to establish the glacier-climate relationship in this terrain.

In this study, Multi temporal Landsat Images of Karakoram region (of path & row for 148-35 scene) are studied to estimate snow cover conditions vis-a-vis the prevailing surface temperature derived from Land Surface Temperature (LST) estimation values. The satellite data from 1991 to 2017 (starting June to Oct months) pertaining to summer season are used as the terrain received maximum solar radiation and also maximum snow ablation during this period. LST has been calculated using thermal bands adopting both single and split window algorithms. Both Landsat data and the Advanced Space borne Thermal Emission and Reflection Radiometer (ASTER) DEM of 30 meter data are used to delineate the snow equilibrium line (ELA) and further examine the temperature variation with respect to elevation for the region pertaining to peak summer seasons (considering Aug-Sept months).

The studies indicate that the there is a rise of 0.70K over the snow region causing depletion in its surface area. Similarly, the fluctuation of the snow line is in tune with the observed LST. Since the terrain has strategic importance for military planning and operations hence the probable vulnerable sites causing mass movement pertaining to summer seasons has been identified and displayed in a GIS environment.