Glacier behavior in the Himalayas has to be understood and interpreted in light of the multiple driving factors; topography, climate and anthropogenic factors. The observed changes in Himalayan glaciers indicates that the glacier response varies across different ranges. The use of satellite images (1990-2015), DEM, altimetry data supported by selective field campaigns, to map the changes in glacier boundaries, snout, ELA, AAR, volume, thickness, debris cover and several other glacier parameters, show that the glaciers across the six ranges of Pir Panjal (PR), Greater Himalaya (GH), Shamasbari (SR), Zanaskar (ZR), Leh (LR) and Karakorum (KR) showed quite varied changes. It was observed that the glaciers in the KR show the least glacial area recession (1.59%) primarily due to the extreme cold winters with -18oC average temperature. Other glacial parameters like snout, ELA, AAR and glacier volume also showed very little changes in the KR during the period. The glaciers in the LR, with an average winter temperature of -6oC, have shrunk, on an average, by 4.19 per cent during the period, followed by the glaciers in the ZR showing a loss of 5.46 per cent. The highest glacier retreat of 7.72 per cent and 6.94 per cent was observed in the GH and SR with the average winter temperature of -1.3oC and -6.2oC respectively. In the PR (J&K), almost all the glaciers have vanished during the last 6-7 decades due to the increasing winter temperatures. The glaciers in Kashmir showed an overall recession of 26.40 per cent in area which is one of the highest reported in terms of Himalayan glaciers. The glaciers in the valley showed the maximum reduction in thickness (2.56m) using the IceSat data from 2000-08 while the Karakoram glaciers showed the least reduction in thickness (0.53m).

Climate change signals are quite loud and clear in the region and the higher rates of recession are due to the significant increase in the observed minimum winter temperatures. In Kashmir, precipitation is falling more as rain than snow due to the warming in winter. Further, the concentration of black carbon in the valley is highest compared to the other high altitude stations in the Himalaya (5.9 mgm-2). All these factors are responsible for the decrease in the volume and extent of the glaciers in the Kashmir Himalayas. The streamflow have significantly declined in the upper Indus basin particularly since the 1990s. There is a lack of credible knowledge about a melting third pole as is evident from the contradictory reports about the status of the glaciers in the region.  The depleting Cryosphere and the stream flow observed in the upper Indus basin, if not understood in the right earnest, have the potential to complicate the already tense security situation in the South Asian region.