



Estimating Glacier Retreat through Satellite Based Observation In the Beas Basin, Himachal Pradesh, India

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Glaciers are now well recognized as the most reliable indicators of climate (IPCC, 2007), more particularly in the regions where there is an acute paucity in the availability of meteorological database. Subsequently it can be said that monitoring the glaciers is important to assess the overall reservoir health (Kulkarni et al., 2007). Almost negligible studies have been conducted to investigate the deglaciation status in the Indian Himalaya. A change detection analysis of the areal cover of glaciers in the Beas basin, India with the aid of remote sensing techniques in the present study concludes that the Beas basin has witnessed a loss of about 22.49 km² in the last four decades which is about 22% of the area. Another major aspect of this study is the noticeable retreat of the glaciers in the period 1972-1989. The glaciers in the Beas basin show larger area loss in this period as compared to the loss in area during the 1990s and later. Thus, it can be said that in spite of the alarming scenario of a continued recession of the glaciated terrain in the Beas basin, the pace of retreat has been observed to slow down after the 1990s. The loss has been more significant in the glaciers comprising of the area of 2-5 km² range as compared to the other categories. Glaciers in the area range more than 5 km² and less than 2 km² show less variation reflecting not much of significant loss. The total number of glaciers increased in the period of last four decades although not very significantly, indicating fragmentation. The glaciers in the range 0.5-2 km² show a higher tendency towards fragmentation. The average elevation of the glaciers in the basin underwent an upward shift from 4565 m in the year 1972 to 4629 m in the year 2006 which is a reason for concern. The gradual upward shifting of contours over a period of almost four decades can be a consequence of a shift in Equilibrium Line Altitude (ELA) which has been constantly moving upwards showing a retreat of glaciers in the region. Moreover, it is also indicative of a negative mass balance.