**Understanding Regional Climatic Change with Glacier Terminus Fluctuations in Sikkim Himalaya, India**

***Parvendra Kumar1***

***1****Dr. Harisingh Gour Central University, Sagar, Madhya Pradesh, India, 470003.*

Glaciers being one of the most sensitive indicators of climate change contain huge repository of landforms that can be used as proxy data source to assess magnitude and frequency of processes over time and space. Sikkim state lies in the Eastern Himalaya with climatic settings range from tropical to cryospheric and dominated by SW monsoon, followed by the winter rain from the South China Sea as well as the Mediterranean Westerly which directly influence the behavior of glaciers in the region. In such geo-climatic settings even any smaller changes in climate will be reflected very well in the secular movement of glaciers in region. We assessed 26 glaciers based on remote sensing data (1975 to 2014) and several field visits to the glaciers in the Sikkim Himalaya. In addition, we also assessed the impact of climatic parameters from 1957 to 2005, along with non-climatic parameters on glacial terminus behavior. On an average, glaciers retreated at ̴ 6.89 m yr -1 from 1975 to 2014 which is lower than other parts of the Himalaya as reported. Moreover, annual average temperature decreased (-0.24 oC) and precipitation increased (19.79 mm) during 1957-2005 at Gangtok station in Sikkim Himalaya. Out of 26 assessed glaciers, 15 glaciers remained stationary, and 11 glaciers retreated with varied rates. Only two glaciers retreated continuously for the entire assessment period. Temporally, the average rate of retreat increased from 6.60 m yr -1 (1975-1988) to 7.04 m yr -1 (1988-2000), 10.86 m yr -1 (2000-2005), which drastically reduced to 1.47 m yr -1 during 2005-2009. It is followed by an increased average rate of retreat of 7.66 m yr -1 between 2009 and 2014. Dissimilar patterns of glacial retreat for the entire Sikkim Himalaya in general, and within 10 km wide buffer zones, in particular, suggest a weak control of general climate on glacial fluctuations in this region. Moreover, non-climatic parameters have shown a strong control on glacier fluctuations as the glaciers with glacial lakes, glaciers with simple form, glaciers with snout aspect to E, SW, and ES and glaciers with a length below 7 km show higher rates of retreat than the others.

*Keywords:* Sikkim Himalaya, Glaciers, climate change, non-climatic factors.