Climate-Glacier Interactions Along Himalayan and Trans-Himalayan Regions

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Himalayan and trans-Himalayan regions is the home of thousands of glaciers ranging from small (<1 Km), Medium (1-5 Km) and large (>5 Km). It is well known that Glaciers are impacted by the climate variability and even climate change. Glaciers thus have the signatures of climate variations on decadal to thousands of year scales. Recently, lot of work have been done on the retreat / extension of the Himalayan and trans-Himalayan glaciers in several countries. The paper critically reviews this work and comes to the conclusion that in the recent past since the mid-20th century majority of glaciers have been receding with different magnitudes on decadal and inter-annual basis. The ELA of glaciers have also increased in altitude by a few 100 meters thereby suggesting that the 00 Isotherm might have also increased in altitude and the three line in the 2 regions might have also increased. This could be the direct effect of climate variability from decadal stage. The data also suggest that all those decadal, centennial and millennial scales are evolved in the glacial dynamics which is too early to conclude that the glaciers in these regions are depleting under the anthropogenic climate change.

The best way to face the climate change threat to glaciers is to organize an efficient long term monitoring of the large glaciers in the region. The smaller glaciers may undergo fast changes whereas the larger glaciers are not likely to disappear in the next 500 to 1000 years inspite of the threat. The paper highlights the current research work with regard to the mass balance, hydrological, meteorological and chemical studies of some of the major glaciers over the 2 regions.