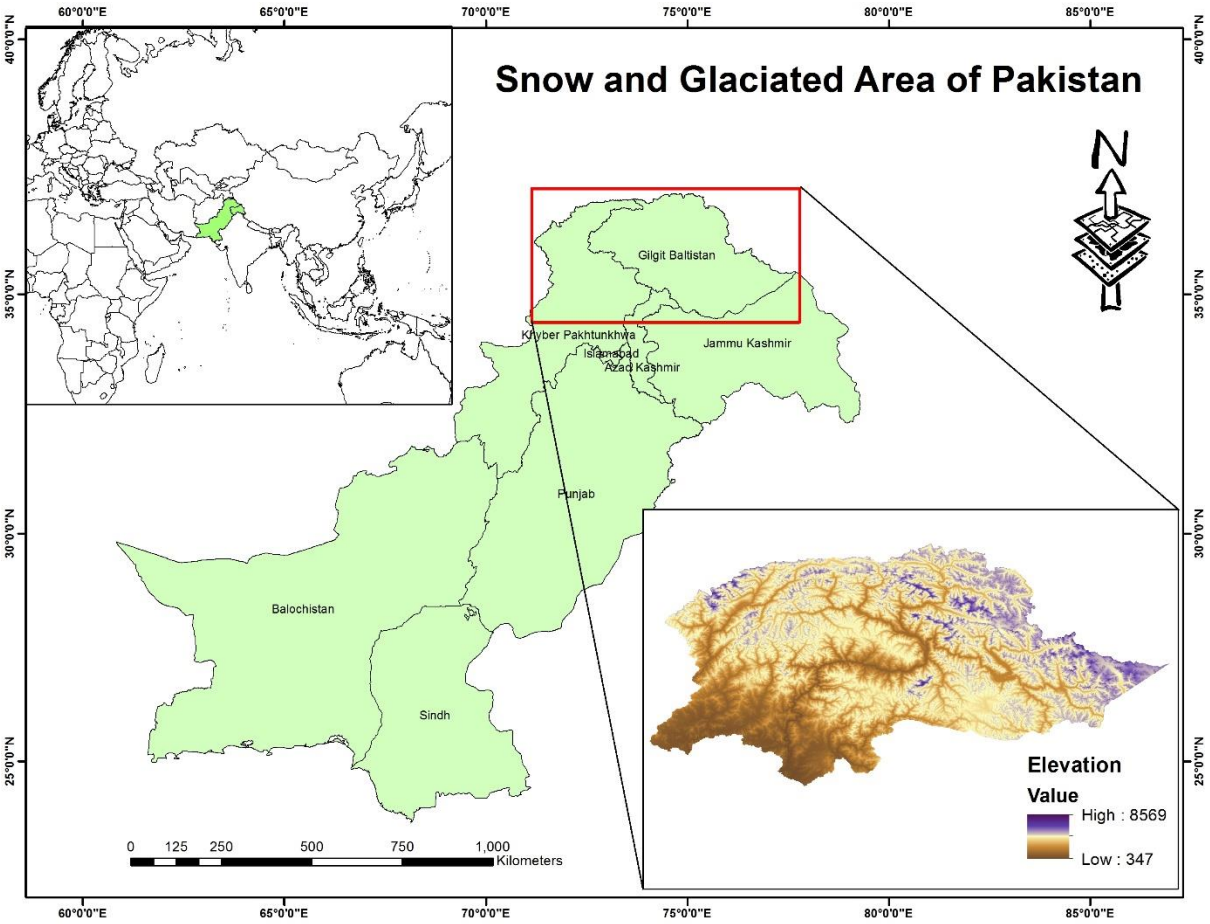
Introduction:

Hindu Kush-Karakorum-Himalayas (HKH) ranges join together in Northern Pakistan to host world largest repository of snow and glaciated ice outside Polar Regions. The confluence point of three prominent mountain ranges of the world also lies in Pakistan. The snow and ice in this region replenishes inflows in Indus River and its tributaries which ultimately contributes in safe and clean drinking water for domestic usage, irrigation, and hydropower generation in the downstream part for agrarian based economy of Pakistan.

The fragile mountainous environment is adversely vulnerable toward spectre of global Warming and Climate Change. In IPCC's report it was claimed that Glacier in HKH are melting rapidly, therefore, PMD operating as National Meteorological and Hydrological Service in Pakistan decided to step in permanent glacier monitoring, so that, the pace of climate change, and its impacts in Northern Pakistan, can be estimated.

In addition to field visits to study dynamics of glaciers and glacial lakes, remote sensing and Geographical Information System (GIS) techniques were also applied to study various properties of snow and glacier and their geomorphology. PhD and Master degree holder researchers in relevant field along with supporting technical staff is engaged in different targets related to monitoring of glacier and glacier dynamics.

The Snow Cover Area (SCA) for the Northern Pakistan was also extracted from satellite snow products. The MOD10A2 and MYD10A2 snow products from MODerate-resolution Imaging Spectroradiometer (MODIS) scientific instrument, built by Santa Barbara Remote sensing in 2002 (https://nsidc.org/data/modis/data_summaries), aboard on Terra and Aqua Satellite with the spatial resolution of 500 meters and temporal resolution of eight days was being used for extraction of snow cover area. The snow cover mapping was done using algorithm that differentiates pixels as snow, ice lakes, cloud, water, land and others (Hall et al., 2002).The changes in snow and glacier parameters will be addressed and analysed in the vague of climate changes.


Snow and Glaciated Area of Pakistan
N
60°0'0"E
65°0'0"E
70°0'0"E
75°0'0"E
80°0'0"E
85°0'0"E
40°0'0"N
35°0'0"N
30°0'0"N
25°0'0"N
Gilgit Baltistan
Khyber Pakhtunkhwa
Islamabad
Azad Kashmir
Jammu Kashmir
Punjab
Balochistan
Sindh
0 125 250 500 750 1,000
Kilometers
Elevation
Value
High : 8569
Low : 347