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Melt generated through snow and glaciers are considered to be a vital fresh water resource because they store the solid winter precipitation as then act as a reservoir to provide water when it is mostly needed i.e. during the summer season. Recently, a lot of studies based on hydrological modelling showed that the changing climate will adversely affect the snow and glacial melt patterns around the globe. Considering this situation it is quite critical to know more about these melting processes and the factors driving them.

Degree-day approach for simulating the flows generated through the snow and glacial melt has proved to be a handsome one because it uses the temperatures as an index variable to address the complex energy balances as well as its only dependency over the air temperatures to generate the melt make it feasible especially for the high mountainous data scare regions (e.g. Upper Indus Basin). Degree-day models use the Degree-Day Factor (DDF) as a ‘key’ parameter which transforms one degree-day [$°C.day^{-1}$] into daily melt depth [$mm.day^{-1}$]. Literature enlightens that the DDF is not a constant parameter but it changes with the ripening of the snowpack.

In the present research, snow measurement datasets from three different locations e.g. Japan (Enshurin 173m a.s.l.), Germany (Brunnenkopfhütte 1602m a.s.l.), and Pakistan (Deosai 4149m a.s.l.) have been collected and evaluated for the estimation of the DDFs. Initial findings show that there exists a considerable spatio-temporal variation of the DDFs. Which ranges from 0.3 – 6.8

[mm°C^{-1} day^{-1}] in the German Alps, 0.2 – 7.9 [mm°C^{-1} day^{-1}] in Yamagta Forest Japan and reaches ≥10 [mm°C^{-1} day^{-1}] in the Himalayan ranges during the snowmelt season.

In general, the DDFs show an increasing trend during the snowmelt season at different elevations, which not only demonstrates the altitude influence on the variability of the DDFs but also links to changing snow densities. Latter suggests that the DDFs should not be taken as constant because it changes with the location and needs to be estimated for different regions.

KEYWORDS: Degree-Day Factor, Snow and glacial melt, Measurements