

## Hydro-Chemical Characterization of Glacial Melt Waters Draining from Shaune Garang Glacier, Himachal Himalaya

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**Abstract :** A detailed study of the ion chemistry of the Shaune Garang glacier meltwater has been carried out to assess the role of active glacier in the chemical denudation rate. The chemical compositions of various ions in meltwater of the Shaune Garang glacier were analyzed during the melting period 2015 and 2016. Total 112 of melt water samples twice in a day were collected during ablation season of 2015 and 2016. To identify various factors controlling the dissolved ionic strength of Shaune Garang Glacier meltwater statistical analysis such as correlation matrix, Principle Component Analysis (PCA) and factor analysis were applied to deduce the result. Cation concentration for  $\text{Ca}^{2+} > \text{Mg}^{2+} > \text{Na}^+ > \text{K}^+$  in the meltwater for both the years can be arranged in the order as  $\text{Ca}^{2+} > \text{Mg}^{2+} > \text{Na}^+ > \text{K}^+$ . Study showed that  $\text{Ca}^{2+}$  and  $\text{HCO}_3^-$  found to be dominant on the both melting period. Carbonate weathering identified as the dominant process controlling the dissolved ion chemistry of meltwater due to the high ratios of  $(\text{Ca}^{2+} + \text{Mg}^{2+})$  versus  $\text{TZ}^+$  and  $(\text{Ca}^{2+} + \text{Mg}^{2+})$  versus  $(\text{Na}^+ + \text{K}^+)$  in the study area. The cation denudation rate of the Shaune Garang catchment is  $3412.2 \text{ m}^{-2} \text{ a}^{-1}$ , i.e. higher than the other glacierised catchment in the Himalaya, indicating intense chemical erosion in this catchment.

**Keywords :** Shaune Garang glacier, Hydrochemistry, chemical composition, cation denudation rate, carbonate weathering

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