

## Mass balance studies of the Dokriani Glacier from 1992 to 2000, Garhwal Himalaya, India

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### Abstract

Annual mass balance measurements of the Dokriani Glacier in Gangotri area of Garhwal Himalaya were conducted from 1992–93 to 1994–95 and 1997–98 to 1999–2000. The study was carried out by glaciological method, including weekly measurement of ablation stakes and fixed date measurement of net accumulation. Results of annual mass balance for six years show negative trend with the maximum deficit of  $-3.19 \times 10^6 \text{ m}^3$  water equivalent (w.e.) in 1998–99. Annual mean mass balance from 1992–93 to 1999–2000 was  $-2.25 \times 10^6 \text{ m}^3 \text{ a}^{-1}$  w.e. The resulting  $13.54 \times 10^6 \text{ m}^3$  w.e. cumulative volume loss, equal to a thickness reduction of 1.94 m over the study period is significant, since the Dokriani Glacier has average ice thickness of 50 to 55 m. Substantial wasting by  $-2.5$  to  $-3.0 \text{ m w.e. a}^{-1}$  in the ablation area, compared to the mass gain by 0.45 to 0.55 m w.e.  $\text{a}^{-1}$  in the accumulation area was recorded. Equilibrium line altitude (ELA) has ascended from 5030 to 5095 m a.s.l. and accumulation area ratio (AAR) fluctuated between 0.67 and 0.70 during the study period.