

STUDY OF ANNUAL MASS BALANCE (2011-2013) OF RIKHA SAMBA GLACIER, HIDDEN VALLEY, MUSTANG, NEPAL

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ABSTRACT

Little is known about the Himalayan glaciers due to lack of reliable and consistent data, although they are of particular interest in terms of future water supply, regional climate change and sea-level rise. There is thus an urgent need of monitoring the glaciers to bridge the knowledge gap. Therefore, glaciological observation has been carried out by the Cryosphere Monitoring Project (CMP) since September 2011 on the Rikha Samba Glacier in Hidden valley, Mustang district in western Nepal in order to study the annual mass balance. There are ten glaciers in Hidden Valley named G1, G2, G3 up to G10 out of which G5 is the Rikha Samba Glacier having the largest area of 5.37 km² in this valley and the highest and lowest altitudes of the glacier are 6476 m a.s.l. and 5392 m a.s.l. respectively. The glacier mass balance using glaciological method and Equilibrium Line Altitude (ELA) are calculated in this study. The glacier shows a net mass balance of -1.80 ± 0.097 m w.e. for the lower part of the glacier from 10 September 2011 to 3 October 2012 and -0.206 ± 0.019 m w.e. for the whole glacier from 4 October 2012 to 30 September 2013 indicating shrinkage of the glacier. The Equilibrium Line Altitude (ELA) of Rikha Samba Glacier is estimated at 5800 m a.s.l. in 2013. The magnitude of net mass balance for 4 October 2012 to 30 September 2013 is lower than that from 10 September 2011 to 3 October 2012 because we consider only ablation area for period September 2011 to October 2012. The result obtained from this research suggests that the glacier is showing negative mass balance for two years from 10 September 2011 to 30 September 2013 which can be attributed to warming in this region. These results are the preliminary results of scientific study initiated by the CMP which aims to give an account of meteorological and glacio hydrological observations in the glacierized Sangda River basin. This information can also be of great use in determining the ultimate state of the cryosphere of the Himalayan region.

KEYWORDS: Ablation, accumulation, climate change, glacier mass balance, Himalayan glacier