

COMPARISON OF SEASONAL AND ANNUAL MASS BALANCES OF 3 GLACIERS IN THE EVEREST REGION SINCE 2007

Sonam Futi SHERPA^{1*}, Patrick WAGNON² and Rijan Bhakta KAYASTHA¹

¹*Himalayan Cryosphere, Climate and Disaster Research Center, Department of Environmental Science and Engineering, School of Science, Kathmandu University, Dhulikhel, P. O. Box. 6250, Kathmandu,*

Nepal

²*IRD/UJF – Grenoble I/CNRS/G-INP, LGGE UMR 5183, LTHE UMR 5564, 38402 Grenoble Cedex, France*

*Corresponding Author: sonamfuti.sherpa@gmail.com

ABSTRACT

Understanding climate-glacier relationship is of a great interest since glaciers play an intrinsic role in water availability, sea level rise and act as an indicator of climate change. Observations in Himalayan region show shrinkage of glaciers in an accelerated rate, however, the key climatic understanding behind this mass loss is minimum in the presence of a very few glaciological. In this study, 5 years glaciological mass-balance (MB) measurement of Changri Nup Glacier from 2010 to 2015 with updated mass balance of Mera (2007 to 2014, 7 years) and Pokalde (2009 to 2014, 5 years) Glaciers of Nepal are presented and analyzed. Cumulative mass balance of Changri Nup Glacier from November 2010 to November 2014 is -4.88 ± 0.31 m w.e., with a mean annual glacier-wide MB of -1.22 ± 0.31 m w.e. Equilibrium line altitude (ELA0) for steady state condition is calculated as 5550m a.s.l. corresponding to an accumulation area ratio (AAR0) of 59%. Meanwhile, glacier wide mass balance of Pokalde Glacier averaged over 5 years and Mera Glaciers averaged over 7 years are -0.64 ± 0.28 m w.e. and -0.02 ± 0.28 m w.e., respectively. These glaciers affected by the Indian monsoon in summer and influenced by the dry west winds in winter, show an annual mean vertical mass balance gradient of 2.06, 1.33, 0.45 m w.e. (100 m)⁻¹ for Changri Nup, Pokalde and Mera Glaciers, respectively and belong to the summer accumulation type glaciers, where ablation is not negligible during summer as well as in winter but less.

KEYWORDS: Mass Balance, Climate Change, Glaciers, Glaciological study