

## Concise Glacier Mapping and Inventory of Nepal Using Remote Sensing Data and Techniques

SAMJWAL R. BAJRACHARYA, SUDAN B. MAHARJAN and BASANTA R. SHRESTHA  
*International Centre for Integrated Mountain Development (ICIMOD)*

Rapid melting of glaciers resulting subsidence, shrink and retreat of glaciers snout in Nepal Himalaya is prominent in recent decades. The retreat rates of glaciers vary from basins and, in some instances, has doubled in recent years compared to early 1970s. Given these contexts, it is of utmost important to document the present status of the glaciers and to understand the dynamics of cryosphere and its impact. The use of remote sensing data and geographical information system is providing to be one of the most effective means of updating glaciers database.

The concise glacier inventory of Nepal is based on the semi-automatic mapping method using the landsat images of 2007 $\pm$ 2 years and SRTM DEM (90M). The Glacier ID is given as of GLIMS standard and the glacier attribute parameters like Area, Elevation, Aspect, Slope, Thickness and Ice Reserve are derived automatically. The mapped glacier area covers about 4150 km<sup>2</sup>, which is about 3% total land surface of Nepal. The number of glaciers in the inventory has increased but the total glacier area has been decreased significantly compared to 1970s.

Table 1. Concise Glacier Inventory of Nepal in 2009

Basins		Glaciers		Elevation of Glaciers (masl)		Ice Reserve (km <sup>3</sup> )
Name	Area (Km <sup>2</sup> )	Number	Area (km <sup>2</sup> )	Highest	Lowest	
Koshi	21598	751	1160	8437	3962	120.39
Gandaki	26171	1284	1796	8093	3273	152.33
Karnali	36753	1424	1112	7498	3631	67.07
Mahakali	4741	165	98	6850	3954	5.86
	89263	3624	4167	8437	3273	345.66

Keywords: Glaciers; retreat; inventory; semi-automatic method; remote sensing and geographic information systems.

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