

Glacier caves

Just the tip of the iceberg, but may offer clues on climate change

By Joyce Mendez – ICIMOD

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Photo by Maurice Duchene

“I am not a scientist, I’m only an explorer, an eye witness, a photographer, but I have my observations.”

Thus did Maurice Duchene, glacial cave explorer and enthusiast, preface his presentation on the ice caves of the Nepal Himalayas. Duchene had the opportunity to observe the glacial caves up close in the Annapurna, Macchapuchre, Gokyo, Imja, Manaslu, and the Khumbu regions of Nepal at various intervals over the course of a decade. He was speaking before an audience of ICIMOD staff members and guests from the academic/scientific community in Nepal, as well as some scientists from as far as the University of Oslo, Norway and around the globe who were at ICIMOD coincidentally for a workshop on glacier mass balance monitoring. His talk was part of ICIMOD’s Knowledge Management Strategy to foster knowledge sharing and discussion on mountain issues.

Duchene’s fascination with caves began 30 years ago in his native France, where he had explored thousands of caves and abysses, a fascination that took him to the ice caves of Mont Perdu Massif in Mabore, Spain, to caving expeditions in Norway, Morocco, Switzerland, and eventually to the Nepal Himalayas. He has been coming to Nepal since 1997, more frequently or five months a year in the last five years, to descend these little known, little visited, less studied, but vastly fascinating and

mysterious ice caves and ice canyons of the Nepal high Himalayas. Glacier caves have been studied in mountain areas like the Alps, a specialised field called glaciocaveology, but little actual research has been done on them in the Himalayas.

Scientists, therefore, can learn much from lay people like Duchene to lead the way – explorers, trekkers and nature lovers, even communities living near glacier areas who, by virtue of their being there have borne witness to the changes over time on these fragile environments. In the light of climate change, which has lent new importance to glacier research, his observations, documented in photographs and compared with photographs from Google Earth at various times and from the photo collection of American glaciologist Jason Gulley (who has been studying the hydrology of glacial caves in Alaska and Nepal) appear valuable. They offer new ‘leads’ that climate change scientists studying the Himalayas may wish to pursue.

During a trek to the Kangchenjunga, for example, he stumbled upon caves as large as 15m x 25m with considerable water or snow above them, many floors and levels of caves with layers and sheets of ice and stalactite formations hinting at heat underneath, completely different caves in layer make-up and structure as he descended lower down the Annapurna, and a network or ‘gallery’ of caves 100m below the Macchapuchre. He has seen large lakes as originally seen in the Jason Gulley photos in 2000 almost double in size many years later, confirming the claims of rising glacier water levels.

His theory is that the water underneath these caves and in the glacial lakes were not just coming from the melt snow and ice, some were coming from underneath. On the other hand, some glacial caves which he saw in visits in 2006 and 2007 were gone now, and must have been eroded by the melting of ice. The same phenomenon has been observed in various glacier areas that he had revisited. The Annapurna has considerably less water today than 10 years ago, “in fact almost no water!”, in effect concurring the hypothesis of scientists that water in some of these glacial areas may be completely gone in a few years.

“But we cannot draw hasty conclusions, we are only seeing the surface; nobody knows exactly how deep these caves go and what goes on underneath. There is need for more studies and more information.” Duchene is having discussions with ICIMOD to bring scientists to his expeditions in order to come up with scientific explanations and more definitive conclusions. He urges ICIMOD and scientists to study not just glacier lakes but the glacier caves. “It would be interesting to bore-test ice samples 100m below the caves; that might provide us clues to past and future climate trends.” ● JMM