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ICY MATTERS

Melting glaciers and ice caves in the Nepali Himalayas are visible evidences of climate change

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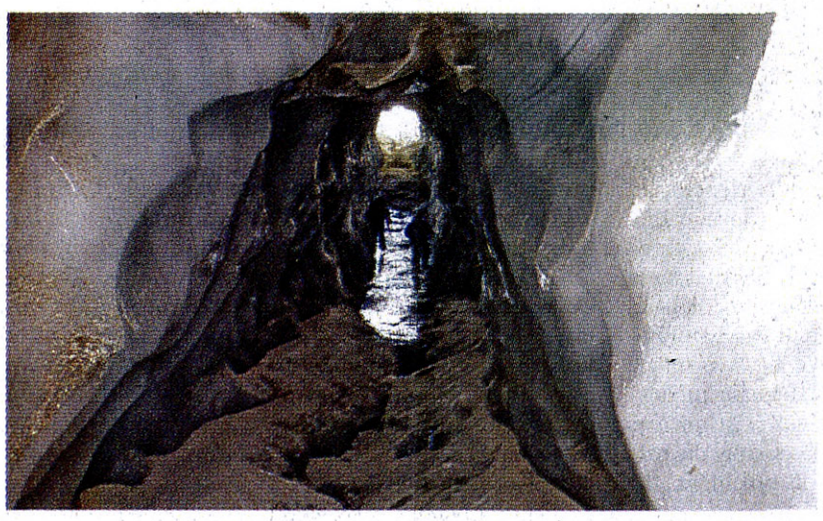

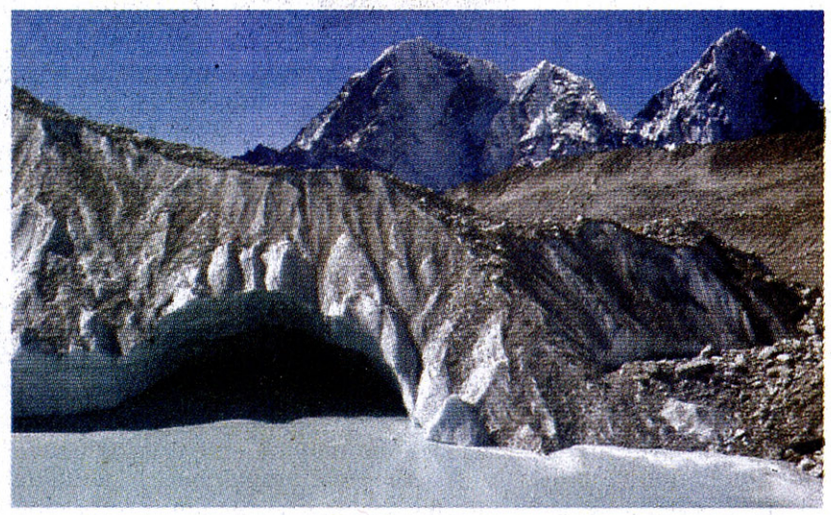

At a time when the attention of the world was concentrated on the Copenhagen climate summit two weeks back, two French explorers—Maurice Duchene and Michel Douat—were busy in Kathmandu, compiling information on their recent visit to the Annapurna range. The duo was very worried about the rapidly-increasing number of ice caves in the mountains, finding 15 new caves in one season itself.

Duchene and Douat have explored 22 mountains areas during the last three years and have discovered a number of small supra-glacial caves with small developments (20-25 m deep) in the major snow-capped mountains of Nepal.

Though the duo are not trained scientists, it was evident that the caves were a result of the snow melting at faster rates, with increases in temperatures in the caves and the fluctuation of water levels themselves causes of worry. "We have been visiting the mountains to witness the real effects of global warming," says Duchene, chairman of the International Centre for the Exploration of the Himalayas, France, adding, "We thought that the Himalayas in Nepal were the best destination to explore."

"The interesting part is that while some of the caves we discovered had water, the others were empty," says Duchene. Douat adds, "What further complicated the matter was the fact that there are no scientific reasons which explain the rise and fall of water levels at different points on the same surface."

The pair goes on to discuss their plans to conduct research on this issue, collaborating with people from the environmental sector, the Department of Hydrology and Meteorology, Nepal Academy of Science and Technology, and the International Centre for Integrated Mountain Development (ICIMOD). "We have found many ice caves and observed them externally but it is now time to determine why the water level is changing so rapidly inside these caves," said Duchene.

According to the two, 15 new caves have been discovered in the Annapurna region because of the speeds at which the snow was melting. In Imja Tse, 20 caves were discovered in just two days. "Of the 22 mountains that we visited, each one has at least 22-25 caves mainly because of loss of snow," says Duchene.

The researchers believe that melting snow means that the water levels in glacial lakes increase every year. As the water from melting glaciers builds up, there is a threat that the lakes could burst through their rock or ice barriers and causing rapid flash floods, better known as glacial lake outburst floods (GLOF)—further, Nepal has at least 20 glaciers that are potentially susceptible to GLOFs.

According to a preliminary research by the two, there is a surplus of water trapped in these cavities. In the event of an outburst, this liquid water could contribute to a rapid deterioration of the glaciers, consequences of which could be as dramatic as GLOF.

The duo had explored ice caves at Cho Oyu, Everest, Kanchanjunga, Khumbu, Manaslu, Annapurna and Imja Tse among others—as well as visiting major glaciers such as the longest glacier of Nepal: Ngozumba, a 19km long glacier in the Cho Oyu region.

However, Ngozumba has been melting rapidly for the last few years and there is a high risk that the moraine could burst, say the two.

Several unsual phenomenons have been noticed in the Khumbu region. The Khumbu glacier itself has seen a one-km-long canyon created by melting waters. On the Nuptse, a large delocalised cave has formed between the rock face and the glacier. Other similar cavities can be seen on the Pumori as well.

But the biggest caves, and melting waters subsequently, have been seen in the Annapurna region. Duchene recalls a cave with a vertical 99m drop, which was earlier filled with water on their last visit. A new cave, 30 m deep, was found near Thorung La, while large cave entrances have been noticed in the Pangre glacier as well. "There are several smaller caves and large unexplored entrances as well," says Duchene.

Ice caves may look beautiful and awe-inspiring, but if the words of the two Frenchmen are to be believed, global warming is resulting in the creation of such structures. Rapidly-melting snow levels are equally endangering the glaciers, which have receded in the last century at rates never seen before.

While the world turns it attention on emissions and mitigations, global warming is very real. And it's happening right under our noses.