

'The coldest place' has melted away

Until a few years ago, the Chacaltaya Glacier on Bolivia's Mount Chacaltaya was known as the world's highest ski resort. Today, the mountain is just a mountain. The glacier has melted. It is a forewarning of severe water shortage in the world's glacier regions.

By Rasmus Thirup Beck and Anders Birch (photo)

Samuel Mendoza was only seven years old when he first set his little feet on the Chacaltaya Glacier 43 years ago. His father worked in the Austrian-style chalet that *Club Andino Boliviano* (the Andes Club of Bolivia) had built for the increasing number of ski tourists, and he took Samuel up to the glacier. Before, the boy could see the snow-covered peak from the family's house. In Aymara, one of Bolivia's old native languages, the adults called it Chacaltaya, 'the coldest place'.

Samuel's first meeting with the mountain and the glacier was not to be his last. On the contrary. When he was 20 years old, he got a job at the chalet, and since then, he has been on the mountain every single day, except when he was ill.

»For the past 30 years, my everyday life has been quite simple. I go up the mountain, and then I come down again. When I was younger, I often slept up there, but now I have to take better care of myself, so I almost always come down at night,« Samuel says one afternoon after work. He is showing us how – in spite of all the new houses that have been built in his El Alto neighbourhood, towering over La Paz – you can still see Mount Chacaltaya from a crossroads very close to his family's house.

The chalet is situated 5,280 metres above sea level, and the altitude is a massive physical challenge. For instance, Martha – Samuel's wife and former colleague at the chalet – is suffering from a disease of the stomach after all the years on Mount Chacaltaya. That was not what made her quit her job two years ago, however. She did it because of the missing ski tourists.

For the glacier and the snow has disappeared in 'the coldest place'. What was once known as the world's highest ski resort is now a powerful symbol of global warming and the water shortage that follows. In August 2009, the Bolivian glaciologist Edson Ramirez, an internationally acknowledged authority who has studied Andean glaciers since 1991, declared Chacaltaya dead.

»Chacaltaya is a sign, a symbol of global warming. During the next 20 years, all minor glaciers will disappear, and the bigger ones will be heavily reduced. We are convinced that this trend is due to climate change. Since the early 1970ies, the rate of deglaciation has tripled, and during the past few years, things have developed at an extremely fast pace.«

A stony run

Edson Ramirez can prove his statements in black and white by means of the photos that have been taken of the glacier since 1940. At first, the ice sheet covered the whole mountain on the right side of the crest, and in the latest photo there is only a small patch left.

Nobody has followed the process as closely as Samuel Mendoza. He has watched the Chacaltaya Glacier shrink from one year to the next – and sometimes even from one month to the next. The pace of the meltdown really accelerated in 2005, he says.

The fact that the ice is disappearing is sad per se, but it has also been a fatal blow to the ski resort industry that he was very fond of. Samuel Mendoza, who is now 50 years old, takes us to the area which was once a ski run. Now, there is a thick, dangerous layer of loose slate stone. The situation almost turns tragicomic, when he demonstrates how to get on and off the ski lift that was powered by a Volvo tractor engine long since damaged beyond repair. He makes a fictive jump to one side, saying »wusj – wusj – wusj« while he moves his hips in a slalom-like fashion.

»I've always liked skiing. In the past, I always went skiing on weekends, and on weekdays too if I had the time. We had giant slalom competitions up here. That was when there was plenty of snow«.

And Samuel was rather good. He won the Bolivian Championship one year, and in his house in El Alto, he keeps a small selection of photos picturing him going down the run at full speed.

»10 years ago, you could almost ski all year. There was snowfall in December, January, February, and March. And then in August, September, October, and December. There was plenty of snow, and it was very cold. Now, there is much less snowfall, and it is warmer. That is what spoiled our ski run, the world's highest ski run, Chacaltaya,« he says later on, smiling apologetically over a cup of coca tea in the chalet.

Edson Ramirez and his colleagues confirm his statement. In Bolivia, the average temperature has risen 0.5-1.0 degrees in the past decades, and the change in precipitation has been even more distinct.

»It worries us all the time that the climate change we are experiencing has caused a shift in the quantity, distribution, and timing of the rain that falls during the whole year. In January 2009, we only had 50 per cent of the rain we ought to have had,« Edson Ramirez explains.

A future without water

The central element of glaciers – water – is not only a pretty sight and fun to ski on. When the ice melts in the summer, it meets a considerable and vital part of the local population's need for drinking water, irrigation, and electricity generation.

Samuel and the other people who are daily visitors to the Chacaltaya chalet have already had a very concrete foretaste of what is to come in the big cities 21 kilometres away. In the past, they collected water for their coca tea, cooking, and toilets by chopping blocks of ice off the glacier and melting it. That is impossible now, and consequently, they have to bring water to work in large containers. They are also feeling the consequences back home in El Alto, where the water has been cut off for a few hours several times – and where people in other neighbourhoods have had to do without water at night and on weekends.

To a large extent, the water utilities of La Paz and El Alto are fed by the glaciers of the highest mountains around the cities – such as Illimani and Huyani Potosi, whose snow-covered peaks can always be seen by all inhabitants. And those glaciers are the next ones to melt, Edson Ramirez estimates:

»If nothing changes within the next 30 years, most of the minor glaciers below the altitude of 5,500 metres will be gone, and the big ones located above 6,000 metres will be heavily reduced. It will constitute a very considerable challenge for us.«

It is up to the Bolivian government to find out how to meet the challenge, and consequently, it has prepared a Programa Nacional de Cambios Climáticos, a national climate change programme by means of which it will handle the problems.

Carlos Salinas, who is in charge of the programme, does certainly not take an optimistic view of the future.

»Bolivia is one of the countries which will be affected the most by climate change. If the world community does not pull itself together and reduce carbon emissions drastically and dedicate help to the developing countries that suffer the most, our future looks very, very bleak. And at this point, it is worth remembering that Bolivia has almost nothing to do with what is happening. It has been calculated that we are responsible for 0.03 per cent of carbon emissions, « he says with a stony stare behind the modern glasses.

Immediate adaption

For Bolivia, like any other country affected by climate change, now is the time for adaption – or 'adaptacion' as it is called in the international aid language. In Bolivia, the most urgent adaption exercise is adjusting the country's

outdated water distribution system, which consists of old, extremely leaky canals that take the melt water from the glaciers to the water utilities. Edson Ramirez and Carlos Salinas agree that the canals must be modernized, and that more water reservoirs should be constructed. And it has to be done right now – or else there will be no water to dam.

For the otherwise very sober-minded and fact-driven scientist Edson Ramirez, the dramatic developments of the past 10 years have been difficult to witness, not least at the personal level:

»When I was a student, when I was a boy, I remember that usually the teachers would talk to us about our country and how there were eternal snows. Today, I understand that it is not so. It is sad, particularly because the people who live here now are among the last to have the privilege of knowing the glaciers. But future generations won't have that.«

Samuel Mendoza still insists on teaching his children how to ski whenever there is just a little snow at the top of Mount Chacaltaya. He is even dreaming that one day there will be snow canons or man-made slopes on the old run. However, he is not blind to the water shortage problem in the city below. He hopes that someone will manage to do something in time: »If there is no water, we'll be in trouble. Big time. We shouldn't wish for that kind of a future.«

Fact Sheet1

The world's glaciers are disappearing

Chacaltaya is not the only glacier that has melted or is melting. On the contrary. All over the world – from the Andes over the Himalayas to the Alps – the ice sheets are retreating. And the same goes for the polar regions, of course.

The size of the world's glaciers has always varied. They have advanced or retreated from one year to the next or from one decade to the next. Nevertheless, the deglaciation of the past decades is unprecedented, and most scientists blame climate change in general, and global warming in particular. When temperatures rise, the ice will obviously melt. What is also important, however, is that there is often less rainfall and fewer clouds, allowing the sun to shine more directly on the ice.

In developing countries such as Bolivia, the summertime melt water from the glaciers constitutes a vital resource. Without the glaciers, there will simply be no water for long periods of the year.

Nevertheless, the first consequence of the glacial meltdown is more water, i.e. the towns and cities close to the glaciers will benefit for a short while, except that the risk of flooding will be higher. As the glacier retreats, it will accumulate less precipitation during the rainy season, and over time, the quantity of summertime melt water will be drastically reduced. The last phase is when the glacier disappears completely, and then people nearby can only collect rainwater when it is raining.

In industrial nations, particularly in the Alps and Rocky Mountains, the people who live close to the glaciers are trying to save their ice sheets, because they make a lot of money out of ski tourism. Every year, the owners of the Swiss ski resort in Verbier will cover the Tortin Glacier with a giant, 2.500 square metre thermo sheet in order to protect it from the sun. The European Environment Agency (EEA) estimates that three quarters of the glaciers of the Swiss Alps will be gone by 2050 – and the rest of the Alps will be affected to a comparable extent. The Danes will also feel it in connection with their yearly ski vacations.

Sources: The UN Climate Panel, The European Environment Agency (EEA), and 'Is it the end of snowy heights?' by Edson Ramirez et al.

Fact Sheet2

Bolivia in brief

History: Bolivia, named after the independence fighter Simon Bolivar, who led an uprising against the Spanish colonialists, broke away from Spanish rule in 1825.

Capital: Sucre (constitutional capital), La Paz (administrative capital) – the world's highest capital located 3,500 metres above sea level.

Population: 9.8 million.

Geography: Bolivia is located in central South America, southwest of Brazil. The total area is just under 1.1 million square kilometres, or more than 25 times the area of Denmark. The country has no coastline. However, Bolivia shares Lake Titicaca with Peru.

President: The radically left wing Evo Morales, who came to power in 2005, promising to finish the West's exploitation of his country.

Additional information: Bolivia holds the world record for coups, counter-coups, and changes of government: more than 200 altogether during the country's history.

Source: CIA World Factbook