

## Climate change deteriorates water quality in the Himalayas affecting 40 percent of world's population

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A new study by Lappeenranta University of Technology (LUT) on the climate change and geochemical process of waters and lake sediments on the Tibetan Plateau show that global warming affects geochemical processes such as glacier melting, soil erosion and sediments release. This deteriorates water quality of rivers and lakes, thus significantly impacting the lives of 40 percent of the world's population living in the area.

According to the results concentrations of mercury, cadmium and lead in high-altitudes <u>lake sediments</u> where there is less human activity were significantly higher compared to low-altitude areas where more people live. This finding indicates that atmospheric long-range transportation of pollutants in remote areas of the Himalayas might deposit at high altitudes. Precipitation during the monsoon season in the region has high concentration of nutrients implies that atmospheric pollution is possibly being transported to the Himalayas from South Asia by the India monsoon, which means human activities in the surrounding area have effects on the waters of the Tibetan Plateau.

The research also found that arsenic concentrations in rivers in the Southern Tibetan Plateau were higher than the guideline for drinking water set by World Health Organisation (WHO) due to the existence of thermal spring in this region.



Tibetan Plateau has an extensive permafrost cover and there is a lot of carbon stored in it. The temperature in the area has been increasing for the past 500 years and the climate in the central plateau has been warming more than other regions in the last century. Rising temperatures export old carbon stores from ancient permafrost into contemporary rivers in the Tibetan Plateau. Global warming will continue to release more carbon to the water system, which will, in turn, intensify the regional climate change and affect water quality.

The Tibetan Plateau is the highest <u>plateau</u> on earth and is also known as the "Third Pole" and "water tower of Asia". Water quality is an essential issue for the inhabitants around the Himalayan area. The water quality in this region is under the threat of climate change as well as human activities as the two population-heaviest countries, China and India, are located in the area. However, local citizen's awareness on understanding of climate change on water quality and mitigation actions on are very limited. Researchers analysed the impacts of climate change on <u>water</u> quality of the lakes, precipitation, as well as headwaters in three major Asian rivers in the Tibetan Plateau: Yangtze River, Yarlung Tsangpo River and Ganges River.

Professor Mika Sillanpää, the director of the project, also calls for urgent research to be done to understand the carbon cycle at the Himalayas.

"Global warming is releasing increasing amounts of carbon matter from permafrost to waters and then to the atmosphere. This will intensify the regional and even global <u>climate change</u>. It will affect human livelihoods, rangeland degradation, desertification, loss of glaciers and more." Mika Sillanpää said.

**More information:** Pengfei Chen et al. Yak dung combustion aerosols in the Tibetan Plateau: Chemical characteristics and influence on the



local atmospheric environment, *Atmospheric Research* (2015). DOI: <u>10.1016/j.atmosres.2015.01.001</u>

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