

Asian water towers are world's most important and most threatened

December 9 2019



Credit: CC0 Public Domain

Scientists from around the world have assessed the planet's 78 mountain glacier-based water systems. For the first time, they ranked them in order of their importance to adjacent lowland communities while assessing their vulnerability to future environmental and socioeconomic changes. These systems, known as mountain water towers, store and transport water via glaciers, snow packs, lakes and streams, thereby

supplying invaluable water resources to 1.9 billion people globally—roughly a quarter of the world's population.

The research, published in *Nature* on Dec. 9, provides evidence that global water towers are at risk, in many cases critically, due to the threats of climate change, growing populations, mismanagement of water resources, and other geopolitical factors. Further, the authors conclude that it is essential to develop international, mountain-specific conservation and climate change adaptation policies and strategies to safeguard both ecosystems and people downstream.

Of the 78 global water towers identified, Asian Water Towers relied on the river systems including Indus, Tarim, Amu Darya, Syr Darya, Ganges-Brahmaputra are ranked as the most important and most threatened water towers.

The most relied-upon mountain system is the Indus water tower, according to their research. The Indus water tower—made up of vast areas of the Himalayan mountain range and covering portions of Afghanistan, China, India and Pakistan—is also one of the most vulnerable.

To determine the importance of these 78 water towers, researchers analyzed the various factors that determine how reliant downstream communities are upon the supplies of water from these systems. They also assessed each water [tower](#) to determine the vulnerability of the water resources, as well as the people and ecosystems that depend on them, based on predictions of future climate and [socioeconomic changes](#).

The study, which was authored by 32 scientists from around the world, was led by Prof. Walter Immerzeel and Dr. Arthur Lutz of Utrecht University, longtime researchers of water and climate change in high

mountain Asia.

"What is unique about our study is that we have assessed the water towers' importance, not only by looking at how much water they store and provide, but also how much mountain water is needed downstream and how vulnerable these systems and communities are to a number of likely changes in the next few decades," said Prof. Immerzeel.

Dr. Lutz added, "By assessing all glacial water towers on Earth, we identified the key basins that should be on top of regional and global political agendas."

Prof. YAO Tandong, renowned glaciologist from the Institute of Tibetan Plateau Research of the Chinese Academy of Sciences, a co-author of the study, said a temperature rise of 2° C, as described by the Paris Conference on Climate Change, could cause Asian water towers to see a temperature hike as high as 4° C.

"By 2060 to 2070, rising temperatures due to climate change could lead to ever-stronger glacial retreat in the region," said YAO. "In other words, the melting glaciers in Asian water towers could reduce the water supply for people living downstream in coming decades."

Prof. YAO is one of the first scientists to study glacier changes on the Tibetan Plateau and has spent years studying changes in Asian Water Towers. He is also the chief scientist of the Pan-TPE project that supported this research. The Pan-TPE project was launched in 2018 by the Chinese Academy of Sciences to echo calls from Third Pole Environment. It's an international science program to investigate [water](#), ecosystem and human impact in the region, with a focus on Asian Water Tower changes.

More information: Immerzeel, W.W., Lutz, A.F., Andrade, M. et al.

Importance and vulnerability of the world's water towers. *Nature* (2019)
[DOI: 10.1038/s41586-019-1822-y](https://doi.org/10.1038/s41586-019-1822-y)

Provided by Chinese Academy of Sciences

Citation: Asian water towers are world's most important and most threatened (2019, December 9)
retrieved 20 March 2024 from <https://phys.org/news/2019-12-asian-towers-world-important-threatened.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.