Giant, deadly ice slide baffles researchers

Climate change could be to blame for Tibetan tragedy.

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Jibiao Zong

The massive ice avalanche in Rutong county, Tibet, covered 10 square kilometres with its debris.

One of the world's largest documented ice avalanches is flummoxing researchers. But they suspect that glacier fluctuations caused by a changing climate may be to blame.

About 100 million cubic metres of ice and rocks gushed down a narrow valley in Rutog county in the west of the Tibet Autonomous Region on 17 July, killing nine herders and hundreds of sheep and yaks.

The debris covered nearly 10 square kilometres at a thickness of up to 30 metres, says Zong Jibiao, a glaciologist at the Chinese Academy of Sciences' Institute of Tibetan Plateau Research (ITPR) in Beijing, who completed a field investigation of the site last week.

The only other known incident comparable in scale is the 2002 ice avalanche from the Kolka Glacier[1,2] in the Caucasus Mountains in Russia, says Andreas Kääb, a glaciologist at the University of Oslo in Norway. That catastrophic event killed 140 people.

Preliminary analyses show that the Rutog avalanche was unusual because it started from a flat point at 5,200–6,200 metres above sea level rather than in steep terrain. The ice crashed down nearly one kilometre along the narrow gully and ran into the Aru Co lake, 6 kilometres away.

"The site of collapse is baffling … the Rutog avalanche initiated at quite a flat spot. It doesn't make sense," says Tian Lide, a glaciologist also at the ITPR, who runs a research station in Rutog.

Zong adds: "It went with such a force that the gully was widened out by the process."

Glacier surge

This force is likely to have been caused by lubrication of the ice from rain or glacial melt, and researchers think that increasing precipitation in recent years may be partly to blame.

Temperatures in Tibet have soared by 0.4 °C per decade since 1960 — twice the global average. Warming can generate meltwater that carves out a glacier from within, making it vulnerable to collapse, says Tian.

Kääb thinks that both the Kolka and Rutog avalanches could have been triggered by a rare glacier surge, in which a glacier periodically advances 10–100 times faster than its normal speed. The phenomenon affects about 1% of glaciers globally.

Western Tibet has many surge-type glaciers, and some researchers suspect that climate change at high elevations could affect the frequency of surges[3].

Regardless of what triggered the Rutog avalanche, “climate change is causing more glacial hazards through mechanisms we don’t fully understand”, says Tian. “There is an urgent need for more monitoring and research efforts, especially in populated areas in high mountains.”

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