

Glacial Lakes and GLOF Risk in Nepal

1357
dead

5326
missing

13583
rescued

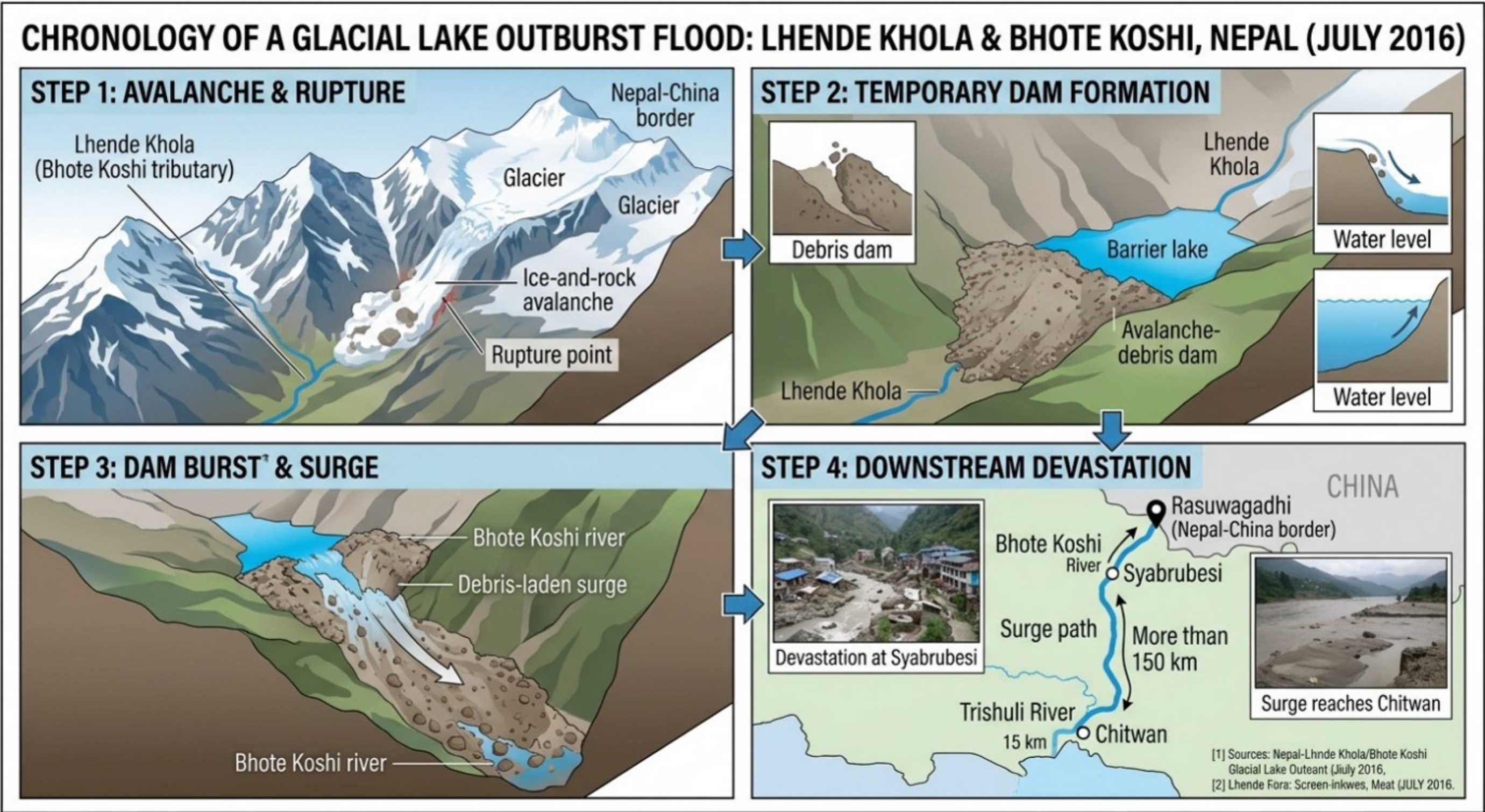


Nepal toll from the Rasuwa flood as of 8 Sep 2026

What happened: Rasuwa Flood, 26 Aug 2026

Under 24 hours: Time from avalanche to the flood reaching communities over 150 km away

Irony: An updated ICIMOD/UNDP lake inventory was released within a day of the disaster, but the lake didn't exist until the avalanche created it that morning.



Not a one-off: three events in 14 months

Date	Location	Trigger and impact
4 Aug 1985	Dig Tsho, Khumbu	Ice fell into a glacial lake, breaching its rock dam; the flash flood destroyed a power plant, 14 bridges, killing 4-5 peoples.
16 Aug 2024	Thame, Khumbu	Cascading two-lake failure; about 770,000 m ³ ; reached Thame in 22 min; USD 6.18M in losses
May and Jul 2025	Tilgau; Rasuwagadhi	Avalanche and supraglacial bursts; bridges destroyed, 8+ dead
26 Aug 2026	Lhende Khola, Rasuwa	Avalanche-dammed lake failure; 1357 dead, 5326 missing, ongoing

What's worrying is how fast these lakes can form and fail, sometimes within hours, often behind avalanche or landslide dams that no one saw coming. It's a hazard moving faster than the maps and inventories built to track it.

How many lakes, how many are dangerous

Scale / inventory	Lake total	Potentially dangerous	Key point
Five-country HKH inventory (Bhutan, China, India, Nepal, Pakistan)	8,790 glacial lakes	203 (204 with Thorthormi, Bhutan)	Regional baseline; often cited as “over 8,000 lakes”
Koshi, Gandaki, Karnali basins (Nepal, Tibet AR of China, India), 2020 assessment, reissued Aug 2026	3,624 lakes: 2,070 Nepal; 1,509 Tibet; 45	47: 21 Nepal; 25 Tibet; 1 India	Most-cited current figure for Nepal's major northern river corridors
Distribution of the 47 PDGLs	-	Koshi 42; Gandaki 3; Karnali 2	Koshi basin (Everest region) concentrates almost all screened risk
Finer-resolution 2023 remote-sensing update	Eastern Himalaya (incl. Nepal) now has the region's highest lake count and area	-	Smaller mapping thresholds find more lakes; a methods effect, not new formation alone

Note: Counts vary by survey date, boundary, and minimum lake size; no single number is definitive, and “potentially dangerous” is a screening flag for monitoring, not a failure prediction [2,5].

Why the risk keeps growing

65% faster

HKH glacier mass loss, 2010-2019 vs. the previous decade

30-80%

Projected loss of remaining glacier volume by 2100, depending on emissions

Mechanism:

- As glaciers melt and pull back, they leave behind loose piles of rock and debris (moraines), and lakes build up behind them.
- As mountain slopes become less stable, avalanches and landslides are increasingly the trigger, sometimes bursting these old moraine dams, and sometimes creating brand new lakes behind rock and ice debris, which then collapse too, as seen in 2025-2026.

Danger travels downstream

- In the 2026 flood, the highest death tolls were recorded in Chitwan and Nawalparasi, far downstream of where the flood began.
- **Why:** that is where population and infrastructure concentrate; risk depends on exposure, not just hazard.

The monitoring gap

- ICIMOD-UNDP screening combines lake size and growth, dam condition, glacier state and surrounding slope hazards, refined with satellite imagery, InSAR slope-deformation data, UAV survey and bathymetry for priority lakes.
- But none of this can warn of an avalanche-created lake the same day, the exact gap exposed by the 2025-2026 events.
- Risk reduction now has to rely more on real-time slope monitoring, not just periodic lake inventories.

Priorities going forward

- Extend monitoring beyond mapped lakes to unstable rock and ice slopes that can dam rivers without warning.
- Fund early-warning systems on an ongoing basis, not just at installation. Tsho Rolpa's has failed twice from lack of maintenance.
- Map flood corridors, including far downstream, before approving roads, settlements and hydropower along glacier-fed rivers.
- Strengthen cross-border data sharing with China and India: most PDGLs, and the trigger for the 2026 flood, sit outside Nepal's borders.

Conclusion

2,070 lakes mapped

Nepal's 2020 inventory across its three major river basins; 21 flagged potentially dangerous within Nepal, 47 across the shared Koshi, Gandaki and Karnali headwaters

“The lake that triggered this disaster didn't exist the day before it killed hundreds of people.”

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