INTERNATIONAL CAMPAIGN FOR TIBET

Beyond the Bridge: Warning signs of geologic instability and hydropower dam-induced displacement and disaster in Tibet

https://savetibet.org/beyond-the-bridge-warning-signs-of-geologic-instability-and-hydropower-dam-induced-displacement-and-disaster-in-tibet

November 21, 2025

The November 11, 2025, collapse of the newly constructed 758-meter-long cantilever Red Flag (Ch: Hongqi) bridge in eastern Tibet's Drakpar (Baowan) Village, Barkham (Ma'erkang), Ngaba (Aba) Tibetan Autonomous Prefecture, Sichuan, demonstrates the severe risks associated with massive Chinese infrastructure projects in Tibet. The incident confirms the high potential for future similar disasters triggered by China's vast and reckless hydropower construction scheme. Real-time monitoring detected slope instability 24 hours prior to the landslide resulting in zero casualties during the bridge collapse. However, the collapse reveals a systemic issue: the approval and construction of major infrastructure on high-risk, geologically unstable sites. China's overall construction spree is driven by political imperatives and the desire to fully exploit Tibetan resources to fuel China's expanding energy demands and eventually become an energy exporter.

> **VIDEO:** Bridge collapse

Construction in a volatile region

The Red Flag bridge was a key segment of China's National Highway G317, which links China to Tibet. It was completed in January 2025 before opening to traffic in April and was constructed as a part of the Gyalmo Ngulchu (རྒྱལ་མོ་རྔུལ་ཆུ Dadu, or Salween) River Shuangjiangkou Hydropower Station. Located in one of the world's most geologically volatile regions — where the Tibetan Plateau meets the Sichuan Basin — China claimed the bridge was supposedly engineered to withstand magnitude 8.0 earthquakes before it was swept away by a landslide.

Preliminary investigations attribute the failure of the bridge's right-bank approach (approximately 130 meters) to a landslide triggered by geological instability in adjacent mountainsides. Critically, this instability was exacerbated by water accumulation and pressure from the nearby Shuangjiangkou Dam (the 5th in a long chain of 28 dams planned on the Gyalmo Ngulchu River).

The Shuangjiangkou Dam, dubbed the "world's highest dam" at 315 meters upon completion, began initial water filling on April 3, 2025, with Phase II impoundment starting October 10, 2025 — just weeks before the collapse.

> **VIDEO:** Chinese language news report

Destabilization as a failure point

Evidence points to reservoir-induced geological destabilization as the primary trigger, rather than structural defects in the bridge itself.

Key factors include:

- **Proximity:** The Red Flag bridge spans a gorge immediately adjacent to the Shuangjiangkou dam site on the Gyalmo Ngulchu River.
- **The Hydrostatic Pressure:** Impoundment began in April 2025, raising water levels and saturating unstable mountainsides. The process raised water levels behind the dam, submerging the original river valley and exerting hydrostatic pressure on surrounding slopes and geological formations. This reflects the hydrological

and geotechnical principle that rising water levels can saturate soils, reduce shear strength, increase pore pressure, and trigger slope instability. The collapse of the bridge occurred six months after the reservoir began impounding, which substantiates the probability of the reservoir loading acting as the trigger. This is corroborated by expert analysis of the incident attributing it to reservoir-induced slope instability and critiquing hasty dam construction in geologically vulnerable areas. Official statements from local Chinese authorities attribute the bridge collapse directly to worsening mountainside conditions and a landslide but does not confirm causation was impoundment.

- **Another Massive Landslide:** The subsequent landslide displaced about 3 million cubic meters of material, directly impacting the bridge's piers and right span.

Shuangjiangkou Hydropower Station

The Shuangjiangkou Hydropower Station began site preparation in September 2005, received Chuosijial State approval on April 9, 2015, broke ground on July 13, 2015 and achieved river closure on December 8, 2015.[1] Built at the confluence of the Kyomkyo (ཇྱོམ་ཀྱོ་ Jiamuzu) and Trokyab (སྤྲོ་སྒྲབས་ Chuosijia) rivers in the seismically active Ngaba Tibetan and Qiang Autonomous Prefecture, the 2 GW project advanced rapidly under China's 14th Five-Year Plan.

The Human Cost: Displacement of Tibetan Communities

The construction of the Shuangjiangkou Dam has imposed serious human costs, primarily through the forced displacement of local Tibetan communities. The 3.135 billion cubic meter reservoir spanning two counties (Barkham and Chuchen (Jinchuan)) submerged villages, farmland, and Tibetan cultural sites along the Gyalmo Nguchu River on which the dam is built, displacing an estimated 6,300 Tibetans who depended on the land for subsistence herding and farming.[2]

In a formal personal appeal submitted in February 2025, a widow who was displaced by the dam requested reconsideration of her housing compensation and lamented that by August of the previous year, approximately 80% of the houses in her village had already been demolished.

This situation resembles previous conflicts, such as protests against the construction of the nearby Kamtok (Gangtuo) Dam in Derge County, where hundreds of Tibetans were arrested and detained for opposing the planned submersion of their land and holy sites in February 2024.[3] One of the detainees is reportedly under intensive care at a hospital in Chengdu after Chinese authorities subjected him to torture and other inhumane treatment during his incarceration.[4]

The collapse serves as a physical manifestation of the immense geological risks present in Tibet, where the drive to build energy infrastructure ignores the region's tectonic volatility, ultimately creating long-term liabilities. It also serves to remind us that if China's hydropower plans are completed, 1.2 million Tibetan people will be forced from their traditional lands and homes.

It also exemplifies the geological consequences of large-scale hydropower dams on the Tibetan Plateau, where Beijing's energy ambitions intersect with fragile tectonics and the displacement of Tibetan communities who have occupied the land for centuries. While swift evacuations mitigated tragedy this time, it serves as a cautionary tale for development in vulnerable ecosystems, suggesting immediate reevaluation of China's hydropower projects in Tibet is necessary.

A catastrophe in the making: The Medog Dam

The Medog hydropower project is China's most ambitious hydropower project in Tibet. Currently in the preparation stage after being prioritized in the 14th Five Year Plan, China aims to capitalize on the enormous hydropower potential of a 2000m drop in elevation over 50km by building a tunnel through Namcha Barwa mountain (7,782m).

Medog sits on the border where the Tibetan plateau meets India, making it prone to earthquakes and landslides, as well as geopolitical tensions over a contested national border. The construction and diversion of the river will likely interrupt the river's water flow in India, and any major disasters would cause enormous damage in the form of flash floods. The 50km radius surrounding the planned project is lush, with 60% of the land covered with trees.

Given the sheer size of the hydropower project and the risks that construction will create landslides, it is highly likely that an estimated total of 24,217 residents living within a 50km radius will be impacted by the dam construction and supporting infrastructure.[5] A single rupture at this location could unleash catastrophic floods into India's Arunachal Pradesh and Assam. While the collapse of the Red Flag bridge acts as a stark warning, Medog looms as a potential catastrophe.

In January 2025, following a major earthquake in Dingri County, Shigatse Prefecture, Chinese authorities emptied three damaged reservoirs and relocated at least 1,500 residents from downstream villages as a precaution against potential dam failure. This incident starkly illustrates the vulnerability of large-scale hydropower infrastructure to seismic events.[6] Yet China continues to claim that its planned Medog (Motuo) Dam—which would be the world's largest and most powerful— on the Yarlung Tsangpo river, close to the disputed border with India, will be fully earthquake-resistant despite the manifold and well-documented risks such projects pose in one of the planet's most active tectonic zones.

The Clean Hydropower Myth

Large hydropower dams on the Tibetan Plateau are neither environmentally clean and safe nor socially just. Ecologically, their impacts are severe. Scientific evidence demonstrates that hydropower is not a reliable solution for addressing climate change. Far from being carbon-neutral, large dams can release significant amounts of methane—a potent greenhouse gas—making them particularly problematic in the narrowing window for meaningful global emissions reductions.

China previously demonstrated some caution in 2004 when Premier Wen Jiabao halted 13 dams on the Gyalmo Ngulchu and the Tiger Leaping Gorge project based on social and environmental concerns.[7] However, China's hydropower expansion accelerated around 2011 with the launch of the 12th Five-Year Plan (FYP, 2011-2015), which prioritized hydropower as a pillar of "low carbon" energy to meet growing demand and reduce coal reliance.[8]

Tibetan ecological wisdom

In the face of China's overriding national priority to secure energy supplies and strategy to link Tibet ever more closely with China, Beijing is likely to continue its destructive energy and hydropower policies in Tibet, despite the underlying geological instability, high seismic risk, and severe environmental vulnerabilities.

For millennia, Tibetan communities adapted to the extreme and fragile landscape of the Tibetan Plateau by adopting modest, resilient, and low-impact approaches to construction and resource use. If decision-makers in Beijing were willing to embrace this accumulated Tibetan knowledge and experience, while pursuing genuine, just clean energy initiatives, development in Tibet could achieve greater longevity, safety, and ecological compatibility—offering a more sustainable path forward on the world's highest plateau.

Footnotes:

[1] Shanping Li and Bin Duan, "The Highest Dam in the World under Construction: The Shuangjiangkou Core-Wall Rockfill Dam," *Engineering* 2, no. 3 (September 2016): 274–75, https://doi.org/10.1016/J.ENG.2016.03.019.

[2] Bin Duan (段斌) and Gang Chen (陈刚), "大渡河流域水电科学开发实践分析" [Analysis on Scientific Development Practice of Hydropower in Dadu River Catchment], 水电与新能源 [Water Resources and Hydropower Engineering], no. 6 (2013): 7. See also Duan Bin 段斌, and Chen Gang 陈刚. "和谐理念下的大渡河水电开发关键技术问题前期论证与研究" [Preliminary Demonstration and Research on Key Technical Issues of Dadu River Hydropower Development under the Concept of Harmony]. Chengdu: China Gezhouba Group Corporation Dadu River Basin Hydropower Development Co., Ltd., 2013. http://www.chincold.org.cn/chincold/rootfiles/2013/08/02/1375149235406742-1375149235428451.pdf. 28 See also "China Energy News." 2015. "Construction Starts on Leading Power Station in Dadu River Basin: Will Increase Dry-Season Output of Downstream Cascade Stations by 1.76 Million kW and Dry-Season Power Generation by 6.6 Billion kWh." China Energy News, July 20, 2015, 16. http://paper.people.com.cn/zgnyb/html/2015-07/20/content_1589721.htm

[3] International Campaign for Tibet, “Taming the Drichu: China’s Derge Dam Threatens Tibetan Culture and Communities,” Save Tibet, July 1, 2024, https://savetibet.org/taming-the-drichu-chinas-derge-dam-threatens-tibetan-culture-and-communities/.

[4] Tibetan American Network ཨ་རིལ་བོད་མིའི་བར་ཁྲན་འཛིན། “Tibetan Monastic Leaders Jailed, One Near Death After Torture in Chinese Prison Over Dam Protests,” October 30, 2025, YouTube video, 0:00, https://www.youtube.com/watch?v=qRQAuZGTLbk.

[5] International Campaign for Tibet, “Chinese Hydropower: Damming Tibet’s Culture, Community, and Environment,” December 2024, https://savetibet.org/chinese-hydropower/.

[6] International Campaign for Tibet, “Tibet Earthquake: Tibetan Resilience and Future Risks,” Save Tibet, January 7, 2025, https://savetibet.org/tibet-earthquake-tibetan-resilience-and-future-risks/.

[7] Watts, Jonathan. 2004. “Chinese Premier Orders Dam Project on Tibetan Border to Be Reviewed.” The Guardian, April 10, 2004. https://www.theguardian.com/world/2004/apr/10/china.jonathanwatts.

[8] People’s Republic of China, *The 12th Five-Year Plan for National Economic and Social Development of the People’s Republic of China (2011–2015)* (adopted by the Fourth Session of the Eleventh National People’s Congress, March 14, 2011), English translation, Asia Pacific Energy Research Centre, https://policy.asiapacificenergy.org/node/37. See also Center for Climate and Energy Solutions (C2ES), *Energy and Climate Goals of China’s 12th Five-Year Plan* (Arlington, VA: Center for Climate and Energy Solutions, March 2011), https://www.c2es.org/wp-content/uploads/2011/03/energy-climate-goals-chinas-twelfth-five-year-plan.pdf.

International Campaign for Tibet (ICT) | 1825 Jefferson Place NW | Washington, DC 20036 | United States of America
Phone: (202) 785-1515 | Fax: (202) 785-4343 | info@savetibet.org

ICT Europe
Funenpark 1D | 1018 AK
Amsterdam, The Netherlands
Phone: +31 (0)20 3308265
Fax: +31 (0)20 3308266
icteurope@savetibet.nl

ICT Deutschland e.V.
Schönhauser Allee 163 | 10435
Berlin, Germany
Phone: +49 (0)30 27879086
Fax: +49 (0)30 27879087
info@savetibet.de

ICT Brussels
11, rue de la linière | 1060
Brussels, Belgium
Phone: +32 (0)2 609 44 10
Fax: +32 (0)2 609 44 32
info@save-tibet.eu