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The Teesta Stage-VI Tunnel Disaster and Himalayan Hydropower Risk

22 July 2026

ENVIRONMENT

GS1

GS3

CURATED & WRITTEN BY

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The Teesta Stage-VI Tunnel Disaster and Himalayan Hydropower Risk

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✓ Every fact web-verified against primary sources

On July 20, 2026, a suspected methane gas burst and explosion inside the under-construction Head Race Tunnel (HRT) of NHPC's 500 MW Teesta Stage-VI Hydroelectric Project at Samardung, Namchi district, South Sikkim, trapped 25 workers, at least 22 of whom died, in toxic, oxygen-deficient conditions. It ranks among India's worst hydropower-tunnel accidents and has renewed scrutiny of large hydropower in the young, hazard-prone Himalaya.

WHAT HAPPENED

Construction crews were working deep inside the **Head Race Tunnel (HRT)**, the tunnel that carries water from the intake to the powerhouse, when a suspected accumulation of **methane (CH₄)**, a colourless, flammable and **asphyxiant** gas, is believed to have ignited into an explosion, generating dense toxic fumes and displacing oxygen. In a confined, poorly ventilated tunnel, even a modest release can create a lethal, oxygen-deficient pocket within minutes. Rescue was slowed by the difficulty of ventilating and reaching the affected face. The loss of life is a grave reminder that construction-worker safety must be the first, not the last, consideration in Himalayan infrastructure.

THE PROJECT AND THE RIVER

The **Teesta Stage-VI** plant is a **run-of-river** scheme, which diverts flow through a tunnel to a powerhouse without a large storage reservoir, developed by **NHPC Limited**, India's largest hydropower public-sector company. It sits on the **Teesta river**, the lifeline of Sikkim and North Bengal and a major **transboundary river** shared with **Bangladesh**, where water-sharing remains a sensitive **bilateral** issue.

FEATURE	DETAIL
Project	Teesta Stage-VI HEP, 500 MW
Type	Run-of-river
Developer	NHPC Limited
Location	Samardung, Namchi district, South Sikkim
River	Teesta (transboundary with Bangladesh)
Incident	Methane burst and explosion in the Head Race Tunnel; 25 trapped, at least 22 killed

WHY THE HIMALAYA IS SO HAZARD-PRONE

The Himalaya are **young fold mountains**, still rising as the Indian plate pushes into Eurasia. This makes the belt **seismically active** and geologically restless.

Geological and Gas Risks

Tunnelling here can intersect **methane and geothermal pockets**, highly stressed rock, and shear zones. Sudden gas inrush, rockburst and high ground-water inflow are recognised hazards of deep Himalayan tunnels.

The Cascade of Water Hazards

The basin's fragility was already exposed by the **October 2023 Teesta-III GLOF**. A **glacial lake outburst flood (GLOF)** occurs when a moraine-dammed glacial lake bursts, sending a destructive surge downstream; the 2023 event breached the Chungthang dam and killed scores of people. Together, the 2023 flood and the 2026 tunnel tragedy underline how compounding hazards stack up in a single basin.

DISASTER MANAGEMENT FRAMEWORK

India's response architecture rests on the **Disaster Management Act, 2005**, which created the **National Disaster Management Authority (NDMA)** chaired by the Prime Minister, with **State** and **District** authorities below it, and the **NDRF** for on-ground response. For industrial and tunnel sites, occupational-safety obligations, ventilation and gas-monitoring norms, and mandatory rescue readiness are equally central.

THE LARGER DEBATE

The tragedy sharpens a long-running question: should **large hydropower** be pushed aggressively in seismically active, ecologically sensitive Himalayan zones, or should the region favour **run-of-river micro-hydel, solar and stricter cumulative-impact assessment**? Robust **carrying-capacity studies**,

independent safety audits and worker-protection standards are essential before further expansion.

UPSC RELEVANCE

GS Paper 1: Physical geography of the Himalaya, Himalayan drainage systems, and the formation of young fold mountains.

GS Paper 3: Disaster management, energy infrastructure, and environmental impact of large projects in fragile ecosystems.

- **Prelims pointers:** Teesta is a tributary of the Brahmaputra system and a transboundary river with Bangladesh; methane (CH₄) is a flammable asphyxiant; GLOF means glacial lake outburst flood; NHPC is India's largest hydropower PSU; NDMA is chaired by the Prime Minister under the DM Act, 2005.
- **Mains question:** "Large hydropower in the Himalaya multiplies both energy gains and disaster risk." Critically examine in light of recent Teesta basin events. **(GS3, 250 words)**

★ FACTS CORNER, KNOWLEDGE PEDIA

Teesta river: Rises near Pauhunri/Cho Lhamo in North Sikkim, flows through Sikkim and West Bengal, and enters Bangladesh where it joins the Brahmaputra system.

Head Race Tunnel (HRT): the tunnel that carries water from the intake or reservoir down to the powerhouse turbines.

Methane hazard: CH₄ is both explosive (in the 5 to 15 percent range in air) and an asphyxiant because it displaces breathable oxygen.

GLOF: Sudden release of water from a glacial lake when its natural or artificial dam fails; a rising threat as Himalayan glaciers retreat.

NDMA: Apex body under the Disaster Management Act, 2005, chaired by the Prime Minister; supported by the National Disaster Response Force (NDRF).

Sources: NHPC Limited, National Disaster Management Authority, Ministry of Jal Shakti

Source: The Teesta Stage-VI Tunnel Disaster and Himalayan Hydropower Risk — Ujiyari.com | Free UPSC & State PCS Current Affairs

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