

2025 Blatten Landslide Case Study

Location and Event Profile: Blatten is a small alpine village located in the Lötschental Valley in the canton of Valais, southern Switzerland. On 28 May 2025, a catastrophic mass movement destroyed or buried around 90% of the settlement after the collapse of the Birch Glacier. The event released over 3 million cubic metres of ice, rock and sediment, travelling more than 2 km down-valley and overwhelming the village site.



This was not a sudden, unpredictable disaster. It followed weeks of rockfall from the Petit Nesthorn mountain, which loaded the glacier with more than 9 million tonnes of debris. This increased pressure caused the glacier to accelerate rapidly before detaching. The hazard sequence represents a classic example of a cascading geophysical hazard: rock slope failure → glacier destabilisation → debris flow and valley blockage.

Secondary hazards included partial damming of the Lonza River, creating a serious flood risk upstream, and the potential for further slope failures on neighbouring peaks.

Geophysical and Climatic Processes: The steep, fractured geology of the Alps makes slopes highly susceptible to mass movement. Permafrost thaw, driven by rising alpine temperatures, reduced rock cohesion and increased instability. Glacier thinning and surface meltwater penetration further weakened the ice-bed interface. These long-term climatic changes acted as conditioning factors, while the immediate trigger was the loading of the glacier by rockfall debris.

Impacts on Human Wellbeing:

Social Impacts: Almost all residents lost their homes, community buildings and historical landscape. One person remains missing, but the early evacuation of approximately 300 residents prevented mass casualties. Psychological trauma, loss of identity and temporary displacement have been major social consequences.

Economic and Infrastructural Impacts: Tourism, a key economic activity in the valley, was severely disrupted. Roads, electricity lines and water infrastructure were damaged or buried. The Swiss federal government and cantonal authorities pledged full reconstruction support, highlighting the financial resilience typical of a High Income Country.

Environmental Impacts: Forests, farmland and alpine ecosystems were destroyed or buried. River systems were disrupted, altering sediment flows and increasing downstream flood risk.

Vulnerability and Preparedness in a High Income Country: Switzerland's status as a High Income Country played a crucial role in reducing disaster risk. Vulnerability varied spatially: homes closest to the valley floor and glacier runout zone were most exposed, while higher settlements were less at risk.

Preparedness Factors:

- Advanced monitoring systems (ground sensors, satellite data, visual slope surveillance)
Detailed hazard zoning maps identifying high-risk debris flow and avalanche corridors
Clear communication and rehearsed evacuation procedures
Strong institutional coordination between local, cantonal and federal authorities

Residents had high risk awareness and trusted official warnings, leading to rapid compliance with evacuation orders. This contrasts sharply with many LIC contexts, where lack of monitoring, weak governance and limited public trust often result in high death tolls.

Conclusion: The Blatten landslide demonstrates how excellent pre-event management in an HIC can transform a potential mass-casualty disaster into a largely non-lethal event. While physical destruction was extreme, human vulnerability was significantly reduced through investment in science, planning and governance. The case clearly illustrates the IB Geography concepts of hazard profiles, cascading hazards, varied impacts on wellbeing, and spatial variations in vulnerability and preparedness.

BLATTEN LANDSLIDE (2025): ANNOTATED HAZARD EVENT PROFILE & IMPACTS (IB GEOGRAPHY FOCUS)

NATURAL TRIGGERS (CASCADING HAZARDS)



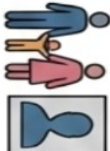
Rock slope failure on Petit Nestrom led to frequent rockfalls, accumulating debris on Birch Glacier [cite: 76, 77, 118]. Climate change (permafrost thaw, glacier shrinkage) acted as a contributing factor [cite: 83, 84, 119].

HUMAN VULNERABILITY & PREPAREDNESS FACTORS



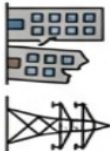
Blatten was within a known debris flow/avalanche risk area [cite: 90]. Effective monitoring, hazard zoning, and early warning systems were in place [cite: 85-91, 120]. Proactive evacuation plans were rehearsed and executed [cite: 91-93].

VARIED IMPACTS ON HUMAN WELLBEING



SOCIAL & HUMAN IMPACTS

Evacuation of 300 residents prevented mass casualties, though one person remains missing [cite: 71, 104]. Social disruption and emotional toll on the community [cite: 103, 105].



ECONOMIC & INFRASTRUCTURAL IMPACTS

Severe damage to tourism, transport, and electricity infrastructure [cite: 100, 101]. Pledged rebuilding assistance from the government [cite: 102].



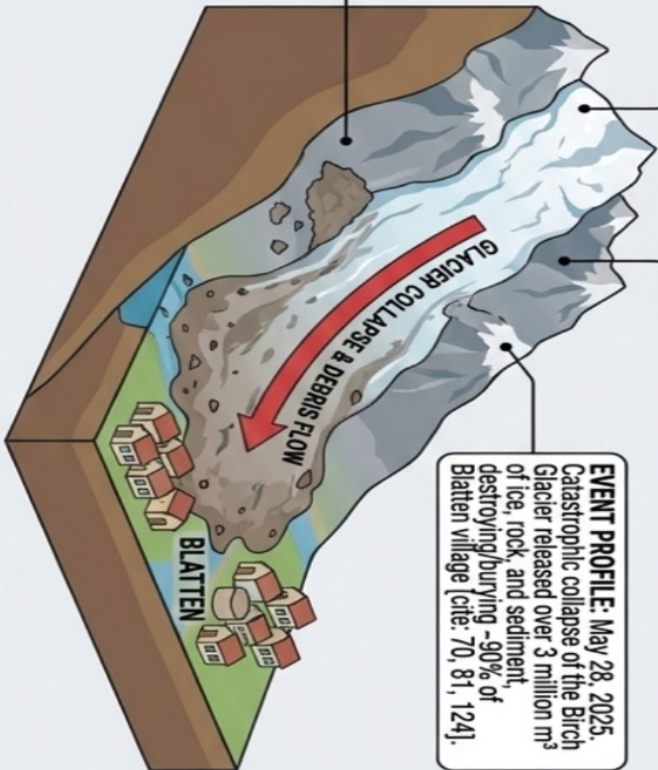
ENVIRONMENTAL IMPACTS

Devastation of alpine ecosystems, farmland, and forests [cite: 99]. Disruption to natural river flow [cite: 98].

SECONDARY HAZARD: RIVER DAMMING & FLOODING RISK



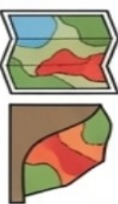
The landslide partially blocked the Lonza River, raising concerns about potential flooding and further secondary disasters [cite: 98, 113].



EVENT PROFILE: May 28, 2025. Catastrophic collapse of the Birch Glacier released over 3 million m³ of ice, rock, and sediment, destroying/burying ~90% of Blatten village [cite: 70, 81, 124].

VULNERABILITY VARIATIONS & PREPAREDNESS (BETWEEN & WITHIN COMMUNITIES)

SPATIAL VARIATION IN HAZARD PERCEPTION



Hazard zoning identified Blatten's location as high-risk, influencing spatial risk perception [cite: 90, 128].

PERSONAL KNOWLEDGE & PREPAREDNESS



Residents had personal knowledge of risks through rehearsals and communication of evacuation plans [cite: 91]. Proactive decision-making and collaboration were key [cite: 94].

GOVERNANCE & INSTITUTIONAL CAPACITY



Strong institutional capacity for monitoring (sensor networks, visual assessments) and inter-agency collaboration enabled successful evacuation [cite: 87, 88, 94]. Resilient planning is crucial [cite: 121].