

2010年1月にパキスタン北部・アタバードで 発生した巨大崩壊と堰止湖の拡大

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Expansion of a Landslide-dammed Lake Following a Catastrophic Landslide in January 2010 at Atabad, Northern Pakistan

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Abstract

At Atabad, northern Pakistan, steep valley slopes on a right side of the Hunza River collapsed on January 4, 2010 (Atabad landslide) and a river blockade occurred. There have been catastrophic landslides with 10^7 - 10^8 m³ scales as well as river blockades in 1858 and 1962 in the surrounding region, indicating that the region frequently experiences landslides. The Atabad landslide has an area of 1,500 m long by 1,000 m wide, and originates from the main scarp located at approximately 3,200 m a.s.l. The released debris, estimated to be *ca.* 4.5×10^7 m³ in volume, accumulated in a mound and mud flow deposit, which spread over an area of approximately 1,500 m long by 500 m wide.

The water level of the landslide-dammed lake (Atabad lake) formed by the river blockade rose rapidly to approximately 30 m within ten days from the collapse and reached a maximum water depth of 120 m in July. On July 7, 2010, the lake reached a maximum length of 21 km and a maximum area of 12 million m², with a volume of storage of 440×10^6 m³, as revealed by monitoring lake growth using multi-temporal satellite imagery. It is considered that water inflow from melting glaciers with rising air temperature caused the expansion of the lake area and the rise of lake level. The excavation of a spillway decreased the risk of outburst flooding and extreme rise of water level since July when the river discharge was at the maximum.

Key words : catastrophic landslide, river blockade, landslide-dammed lake, outburst flooding, multi-temporal satellite imagery, Hunza Valley, Karakoram Mountains

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