

HDS025-10

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Monitoring of supraglacial lakes on Tshojo Glacier by satellite data related to unusual flood event occurred in 2009

Tsutomu Yamanokuchi^{1*}, Takeo Tadono², Jiro Komori³, Toru Koike⁴, Sachi Kawamoto¹, Nobuhiro Tomiyama¹, Puntsho Tshering⁵

¹RESTEC, ²JAXA, ³Nagoya University, ⁴Earth System Science Co. Ltd., ⁵Department of Geology and Mines, Bhutan

Global warming have a serious effect on world cryosphere and it sometimes causes the retreat of glaciers and formation of glacier lakes at the terminus of glacier. This causes a sudden outburst flood called GLOF (Glacier Lake Outburst Flood). GLOF is serious issue at Himalayan countries and actually more than 20 people were dead by GLOF event occurred in 1994 at Bhutan. A recent example is that unusual flood event was occurred along Pho Chu in 29, April, 2009. Tshojo Glacier is located at the headwater of Po Chu River and the source of this outflow water, while there is no huge glacier lake at the terminus of this glacier. Instead of huge lake, there are several spraglacial lakes on the glacier surface and one of the supraglacial lake was disappeared after this outflow event from the interpretation result of ALOS / PALSAR data.

This study aims to reveal the relationship between unusual water outflow event and disappearance of supraglacial lake through temporal analysis of supraglacial lakes on the Tshojo Glacier by using time series satellite data. Both optical and microwave sensor data are used for analysis, which are ALOS /PRISM, ALOS / AVNIR-2, SPOT-2 / XS and PA, SPOT-5 / XS and PA for optical sensor and ALOS / PALSAR data for microwave sensor (SAR) data.

Also, we have done ground survey around Tshojo Glacier in the autumn of 2010 to figure out this outflow event.

Next, we will plan to analyze the temporal change of this small lake and if possible, estimation of lost water volume of disappeared lake using DSM data made from ALOS / PRISM triplet pair. Then, we also try to reveal the relationship between the disappearance of lake and outflow event through the combined study with field survey results.

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Keywords: GLOF, Satellite, Supraglacial lake