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Quick Monitoring Tool for Landslide Dam Outburst Debris Flow and Its Application to the Actual Disaster

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In 2011, Typhoon Talas hit the Kii Peninsula, Japan and caused many deep catastrophic landslides. Some of them blocked the river flow and formed landslide dams. Since large landslide dams sometimes cause catastrophic outburst debris flows or floods, it is critical to monitor the water stage of the ponding water behind the dams to know the time of the outburst. Normally, it is the time when the water starts to overflow. However, it is very difficult to establish a monitoring system of the water stage because landslides always occur deep in the mountains. It could take longer time.

The aerially-placable floating water stage gauge, herein after called APF gauge, was developed to urgently monitor the water stage of the landslide dams. It can be installed by helicopter and simultaneously start monitoring and sending data via satellite mobile phone. At the time of the Typhoon disaster in the Kii Peninsula, the APF gauges were installed into four landslide dams. As a result, the water level monitoring was launched just 2 days after the date of the discovery even under the difficult situation of no access. Depending on the observed data, the time of the occurrence of the overflow was informed as official warning information.