Development of Technologies for Emergency Responses to Sediment Disasters Based on the Experience in the 2016 Kumamoto Earthquake

Sabo Department

We develop and diffuse the technology to evaluate the degree of hazard of slope failure caused by large-scale earthquakes and to develop the technology to grasp a large-scale collapse instantly by space and airborne SAR . We are engaging in the development of technology to reduce secondary disasters caused by rainfall by evaluating the looseness of the ground after the earthquake.

Social Background and Challenges

➢ During and after the Kumamoto Earthquake, 190 sediment disasters occurred. Investigations of the ground were extremely difficult because of the disruption of traffic and frequent aftershocks.

➢ A number of cracks and differences in level were generated around the collapsed areas. New and further collapses were observed after rainfall.

➢ There is an urgent need for the research and development related to effective emergency measures under the circumstances where large-scale earthquakes, including the one along the Nankai Trough, are expected.

Research Details

Development and Diffusion of a technology to evaluate the degree of hazard of slope failure caused by large-scale earthquakes

- Estimating the degree of hazard of slope failure to be caused by expected seismic ground motion in the areas where disaster prevention against the Nankai Trough earthquake is promoted (in the Kii Mountains) and reflecting it in the regional disaster prevention plans through collaboration with the Kinki Regional Development Bureau and discussion with local governments

- Developing a technology to effectively observe and measure the looseness of the ground caused by an earthquake through field investigations, model experiments, and numerical analyses conducted in the course of the outsourced research and a technology to estimate the occurrence of slope failure triggered by rainfall after an earthquake.

Large-scale slope failure triggered by the earthquake
(2016 Kumamoto Earthquake)

Development of a technology to extract large-scale collapse by space and air borne SAR

- Developing a technology to extract a collapse from the image obtained by synthetic aperture radar (SAR), which can survey the ground conditions on a wide scale even in the nighttime or under bad weather, and a technique to map out an investigation plan where multiple space and airborne SARs are effectively combined.
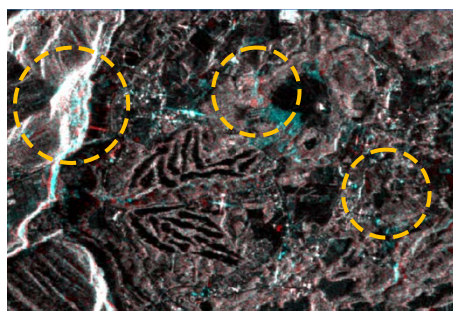
Collapses found by the analysis of SAR images
(2016 Kumamoto Earthquake)

> Responding to sediment disasters caused by large-scale earthquakes properly and contributing to the prevention/mitigation of secondary disasters and smooth recovery

☞Related articles:

- Characteristics of Slope Failure Caused by 2016 Kumamoto Earthquakes (Sabo Planning Division)