

Technical Assistance for Sediment Disasters Caused by Heavy Rainstorms in the Northern Kyushu District

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1. Introduction

From July 11th to 14th, 2012, an active seasonal storm front delivered a record rainfall in the Northern Kyushu district. A total of 268 sediment disasters resulted in 23 dead (or missing) persons and the full or partial destruction of 152 houses in Fukuoka, Oita and Kumamoto prefectures, according to Sabo Department, Ministry of Land, Infrastructure, Transport and Tourism on December 31. By request of Kyushu Regional Development Bureau and Kumamoto prefecture, etc., Erosion and Sediment Control Division, NILIM, along with Erosion and Sediment Control Research Group, PWRI, investigated the Aso District and Kawabe River Basin in Kumamoto prefecture and provided technical guidance on warning and evacuation, restoration measures, and direction for investigations to be made.

The Japan Self-Defense Forces and Fire Departments in charge of searching for missing persons in the Aso District sought advice for secondary disaster prevention. The researchers explained that considerations should be made during searches, amid occasional heavy rains immediately after the occurrence of the disasters.



Photo 1 Technical assistance for missing person searches by the Japan Self-Defense Forces (Shinsho Area in Minami Aso Village on July 13th)

2. Summary of investigation / technical assistance

2. 1 Aso District

Debris flow and slope failure occurred simultaneously in the Aso District mainly at the caldera walls of the somma of Mt. Aso. Since the number of the sediment disasters that caused human and house damage was extensive, NILIM

and PWRI organized 3 groups (a total of 9 members) and performed investigations. At the locations where missing person searches were being conducted, the groups explained to the Japan Self-Defense Forces about observation points such as sediment movements in the streams, rock falls at the head of the failed slopes, and the tilts of the trees, etc., about directions to evacuate such as higher areas in the cross directions instead of downstream areas, and about the speed of debris flow and window time to evacuation, etc. The site manager of the Japan Self-Defense Forces said, "We were concerned about the secondary disasters looking at the debris such as boulders, but now we can make decisions calmly with their advice."

One of the characteristics of sediment disasters in the Aso District is that many surface failures occurred on the caldera walls at the relative height difference of a few hundred meters, and they transform into debris flow, dragging driftwoods into the flow. They include those occurring in the zero-order basins, which do not represent distinct geographical features of valleys. There are cases where collapsed sediment reached areas 50m or more off the toes of the slopes due to fine volcanic soil saturated by a large amount of rainfall and ground water, or other factors. Moreover, there were reoccurrence of slope failure and debris flow in the same torrents as the Aso disaster in 1990; however, there were many cases that the sediment-control dams and other structures prepared by the prefectural government after the earlier disaster prevented or reduced the damage.

2. 2 Kawabe River Basin

Many debris flow and slope failure occurred in Itsuki Village under the jurisdiction of Kawabe River Dam Sabo Office. Though there was no reported human or house damage, unstable sediment remained in the torrents and on the slopes upstream the roads, so the groups provided technical guidance to the office and the village government for the future monitoring systems.

3. Conclusions

The Aso disaster taught us a number of lessons. In the future, we are going to conduct investigations and research into the mechanisms of slope failure and debris flow, effects of sediment control facilities, and warning and evacuation, etc.

【Reference】

NILIM HP: <http://www.nilim.go.jp/lab/rbg/index.htm>