Realization for Rainwater Social with Rainfall Observation and IoT-DRR

*MORIYAMA Toshiyuki[1]

1. Fukuoka Institute of Technology

Since ancient times, residents have mainly managed water management in Rice-cultivating piscatory civilization. This water management has been transferred to the public as modernization, residents' water consciousness is diluted. For this reason, “Labs for Rainwater Society" Study Group (Reference 1) has progressed many projects to restore residents' awareness of water cycle. For example, installation of a rainwater tanks, promotion of the villain, event with residents by the Mizubering Project for His River. The heavy rainfall event at 5th July 2017 in Northern part of Kyushu was a torrential rain once in several hundred years that the affected area receives for the first time after modernization (Reference 2), resulting in many sacrifices and confusion.
In this presentation, I report the analysis results of sediment-related disasters based on the data observed by AMeDAS and XRAIN radar systems.
(1) Based on the slope element assembly model of Hirano et al. (Reference 3), the critical cumulative rainfall amount and the concentration time of the slope were estimated from the history of sediment disasters in the past on that area. Estimation was difficult because the data was unclear.
(2) Estimate the collapse area rate of the slope from the cumulative rainfall amount (maximum value of 180 minutes cumulative rainfall amount) in the watershed at concentration time (3 hours were assumed) using C-band and X-band radar observed with XRAIN (Reference 4). The mean and variance of the occurrence critical cumulative rainfall amount were estimated by least squares method. By calculated collapsed are, the amount of driftwood can be estimated by multiplying it by the wood standing density, and the sediment discharge amount also by the depth of collapse.
Furthermore, as IoT - DRR (Internet of Things for Disaster Risk Reduction)
(3) We introduce the smart rainwater tank (Reference 5) which the research group is conducting and propose to reduce the number of people who evacuate to evacuation centers for water cutoff in the event of a disaster.
(4) Since river water level is not monitored in small and medium rivers in Japan, it is realized inexpensively by IoT divices, and methods for forecasting river water level with high accuracy (Refs. 6, 7, 8), networks with high redundancy, propose the CivicTech to help management by residents.

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