

## Issues of landslide risk management for local community by Warning information of slope monitoring

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So many Landslide and flood disasters occurred during rainfall season every year in Japan. To reduce the damage, the hazard or risk maps are one of the important tools of local community. On the other hand, it is not shown on maps that the intense distribution of rainfall vary with time. This means that hazard area dynamically changes with time. And therefore we have studied the WebGIS system evolved with dynamic information based on warning information.

In this paper, we are going to discuss issues of landslide risk management by warning information of slope monitoring.

Firstly, warning information of slope monitoring is explained below.

we have described that we conducted two large-scale model tests under different condition of groundwater using rainfall simulator at NIED. Surface displacement, ground inclination, moisture content and groundwater level are measured in this test. Then we discuss about the mechanism of unstable slope initiation during rainfall. In addition, we examine the method to define the criteria of rainfall-induced landslides initiation by slope monitoring.

Secondly, landslide risk management is expressed below.

GIS is an essential technology for supporting the various phases of risk management. Especially, WebGIS can integrate various disaster risk information on internet directly and it is easy way for people to access disaster risk information. "e-Community Map", which we have developed as open source software based on WebGIS technologies, integrates geospatial data provided through interoperable data interfaces of various distributors and bottom-up data inputted by local communities. The system delivers dynamic, geo-registered maps using standard international geospatial HTTP protocol services (Web Map Service (WMS), Web Feature Service (WFS), Web Coverage Service (WCS) and etc.) via an interoperable environment. The local communities input their legacy information and tabulated data using PCs, GPS-equipped phones, and other tools. The system outputs maps, including printed maps for off-line communication and field surveys.

In the phase of disaster preparedness, "e-Community Map" is effective for understanding local environment and discussing action for disaster preparation. Local residents can compare and overlay various geospatial data and understand hazards and risks corresponding with them. Then, they can check out points of interests and input various data, photos and memos. In discussion, they can examine the adequacy of preparation and build cooperation with stakeholders. Finally, they make their own maps and maintained them through the participation. And they use their maps for individuals, families and children and improve their preparedness and relationship.

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