



Cluster analysis of Landslide Vulnerable region on an urban Area in South Korea

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Mountain areas occupy about 65% of the territory in South Korea. Due to the rapid population growth and urbanization, many cities suffer from the limitation in space, and hence the commercial buildings, educational facilities, and housing settlement areas continue to stretch until the bottom of the mountain. In result, residents become more and more vulnerable to landslides and debris flow. This led to the central government to perceiving the need for strengthening regulations relevant to urban planning. In order to consider risks due to landslides and debris flow in the stage of urban planning, present authors suggested the strategies, including: first, selecting priority areas necessary to manage landslide-related disasters strictly; second, establishing the integrated management system useful to offer technical assistances to persons in charge of urban planning in the areas; third, promoting disaster awareness programs with those persons along with the central government.

As the first attempt, this study mainly discusses the GIS-application procedures in which authors selected the priority areas, which are summarized:

1. Collect the landslide historical data for the period 1999 - 2012 when the disasters particularly threatened the whole country.
2. Define the areas with the one-kilometer radius around the landslide occurrence places.
3. Exclude the areas where population is less than 100 persons per 1 km².
4. Exclude the areas where mountains with Grade I or II of landslide risk (announced by the Korea Forest Service) go below a certain portion of the area.
5. Carry out the cluster analysis with the remaining areas
6. Classify the types at the standpoint of landslide disaster risk management.

Through the procedures, this study obtained a total of 86 priority areas, which were also classified into 24 areas - Type A (high population exposure and mid landslide occurrence likelihood) -, 25 areas - Type B (mid population exposure and high landslide occurrence likelihood) -, and 16 areas - Type C (high population exposure and high landslide occurrence likelihood).