Effect of land-use on urban landslide in summer heavy rainfall

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Climate anomaly by global warming due to climate change, - typhoon, flooding, drought and landslide etc. - intensifies the degree and magnitude of natural disaster on human environments. In Korea, the climate shows typical summer time Monsoon with concentrated rainfall results in many landslides. About 70 % of the land area of Korea consists of mountains and the landslides commonly occur in mountainous areas after intensive rain, often leading to topographic changes. They constitute a potentially costly risk for human life and the built environment. And landslide is a phenomenon that rock loses balance to external force such as an earthquake or rainfall to weaken the unity of the soil, crumble under a time by the action of gravity.

Moreover, the thickness of colluviums in most parts of Korea including Seoul is generally less than 2m because of the relatively shallow depth of the bed rock. Therefore, shallow landslides in mountainous area are frequent and they constitute a potentially costly risk for human life and the built environment especially in urban area. Additionally, there is a tendency of increasing frequency of local heavy rainfall and landslide damage will be more probable in the future.

During 26-27 July 2011, a heavy rainfall particularly occurred in Seoul, an amount approximately 30 % of the total annual rainfall for that region. There was worst flooding in urban areas by this flooding since the meteorological data have been recorded from 1907. Especially, the landslide debris and flooding from Mt. Woomyeon at Seocho-gu, Seoul resulted in death of 17 people on July 27, 2011. However, no landslides occurred at Mt. Gooryong and Mt. Daemo near Mt. Woomyeon in Gangnam-gu whose precipitation is more than that of Mt. Woomyeon. Therefore, it is necessary to investigate the difference of these two mountainous area landslides. Landslides hazard occur with interaction of many factors like meteorology, topography, geology and soil.

Therefore, the purpose of this research is to investigate the topographic and meteorological characteristics of both Mt. Woomyeon, Mt. Gooryong and Mt. Daemo, and identify the reason of landslides event of Mt. Woomyeon to minimize the property damage and casualties caused by urban heavy rainfall.