Determination method of the geotechnical parameters for assessing the collapse risk of mountain slope

Namgyun Kim, Jaehwan Kwak, and Man-Il Kim
National Forestry Cooperative Federation, Forest Technology Division, Korea, Republic of (knkblue2@hanmail.net)

In Korea, occurrence frequency of mountain disasters like landslide, debris flow, rock fall are increasing due to the extreme weather such as localized heavy rainfall and typhoon during the summer season. The Korea government is investigating and discovering vulnerable areas of mountain disaster to mitigate the damage of people's lives and property. In this study, we selected the mountain slope with high probability of collapse among the vulnerable areas of mountain disaster and suggested reinforcement method through risk assessment. The slope safety factor was calculated using the limit equilibrium analysis for risk assessment of mountain collapse. The risk of collapse was determined by comparing the calculated slope safety factor with Korea government (Ministry of Land, Infrastructure, and Transport) restrict slope safety factor. The Slope safety factor suggested by the government (Ministry of Land, Infrastructure and Transport) is divided into three conditions: dry season, rainy season, and earthquake. Geotechnical parameters for limit equilibrium analysis were obtained by soil test. However, the results of the soil test could be different depending on soil sampling location or the weather condition. Therefore, geotechnical parameters were determined by comprehensive analysis such as comparing literature data, reviewing existing design data, and applying empirical formula of N value by standard penetration test. As a result of risk assessment, it was analyzed that there was a risk of mountain collapse in all conditions except dry season, and it was determined that slope stabilization is necessary.