Development of Statistical Equations for Estimating Snow Damage in South Korea

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Recently, snow disasters have been increased in South Korea due to the unexpected heavy snow in a region where winter gives little snow. For instance, 10 people were dead by the collapsed roof due to the unusual heavy snow. Many local governments do not have enough snow removal equipment because of little snow in winter season. Therefore, it has been important to estimate the amount of snow damage to prepare heavy snow disaster. There are not many researches to estimate damage of snow disaster in South Korea. In this study, historical snow damage data from 1994∼2017 recorded in National Disaster Report were used to predict the future snow disaster damage using a statistical equation. Also, socio-economic factors were considered to estimate possible snow damage. One of the socio-economic factors was Snow Vulnerability Index(SVI). Historical snow depth and amount of snow damage, number of vulnerable houses, and preparedness were considered to calculate SVI. Also, time-dependent snow damage patterns due to the evolution of technology and/or climate change must be considered. The different snow damage pattern causes the bias in the snow damage and the statistical equation has a bias correction process. Principal multiple regression method was applied to develop the snow damage estimation function. Five principal components out of 6 were selected to develop the model and applied to predict the recent snow damages. Total 229 number of local districts have different model and the snow damage were estimated properly. The developed model could be applied to plan the budget for the snow removal equipment or snow damage reduction.