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Pilot Project of Impact-Based Forecast on Heavy Rainfall in Seoul Metropolitan Area, Republic of Korea

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According to the recent rainfall phenomenon in summer, locality is distinct due to the wide variation in precipitation in the same city. In addition, the intensity of torrential rain has increased, and regional damage due to precipitation intensity was different. Since heavy rains cause great damage, especially in cities where social infrastructure is concentrated, the Seoul Metropolitan Office of Meteorology (SMOM) conducted a study for impact-based forecast on heavy rain to mitigate the heavy rain disaster for three years from 2016 to 2018.

Currently, the Korea Meteorology Administration (KMA) issues heavy rain warning system is announced in two stages (advisory, warning) for whole country with no difference of thresholds in each region. For the purpose of the impact-based forecast on heavy rain applying the characteristics of individual city, SMOM progressively developed our research every year. First, in 2016, we studied a threshold of heavy rain in Suwon City and divided the expected flood hazard information into four stages (Be concerned, Be aware, Be prepared, and Take action), and conducted a pilot service to a public official in charge of disaster prevention every six hours until the day after tomorrow. In 2017, we reflected the 2015 annual report of disaster in our study and corrected the threshold with the cumulative three-hour precipitation. We selected five cities (Suwon City, Seoul City, Yangju City, Pocheon City and Yangpyeong County) that were vulnerable to heavy rainfall and provided the impact-based forecast on heavy rain including detailed rain forecast and historical disaster information. In 2018, we corrected the thresholds by analyzing heavy rain cases in 2016 and 2017. After consultation with disaster prevention managers in each city, the threshold was set and the impact-based forecast on heavy rain was expanded to 33 cities in the Seoul metropolitan area.

Over the past three years, SMOM has implemented a pilot project to the impact-based forecast on heavy rain in the metropolitan area, providing various types of warning services. The region was subdivided to study the threshold of heavy rain, and the ensemble model was applied to increase the accuracy of the threshold every year. Through this study, SMOM provided four levels of risk information using the heavy rain risk matrix for each city, supporting disaster response decision-making by local government disaster prevention officials. A detailed study on the impact-based forecast on heavy rain is needed in order to help effectively cope with the rapidly changing local torrential rains.

Key words : Heavy rain, Impact-based forecast, Pilot project, Threshold, Seoul metropolitan area, Risk matrix, Warning system

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