

Hydro-meteorological Early Warning System for Urban Safety

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As experienced in Japan during its rapid economical developing period in 1970's and 80's, concentration of population and land use change in urban area increases its vulnerabilities against urban flood disasters. Furthermore, it is anticipated that the precipitation pattern will be changed and generally intensified due to the climate change associated with the global warming. Even though a lot of mitigation measures to prevent the flood damages including the disaster due to land slide have been implemented in Japan in the last several decades, there were more than 200 casualties due to the flood disaster in 2004 in Japan. It has been pointed that soft measures such as integrated land use management considering the robustness against natural disasters and hydro-meteorological early warning system should be well associated with the hard measures, but research and development on these issues and practical application in the society were not incorporated enough. However, considering the rapid economical growth and concentration of the population to the urban area in Asian countries and the signs of changing climate, it is necessary to develop and implement soft measures such as hydro-meteorological early warning systems now.

Hydro-meteorological early warning systems consist with the data acquisition in semi-real time, the water balance estimation using a land surface model, and the translation into risk evaluation of flood and land slide by comparing the estimates of river discharge and soil moisture against historical estimates, are underdevelopment on the global scale and on the regional scales in Japan and in Indo-China Peninsula, and on the local scale in the Mae Waang River Basin, in the south of ChiangMai, Thailand experimentally under GEWEX/MAHASRI project with support from GEOS/JEPP. Digital information of meteorological forecast is crucial for longer lead time of forecast and warning, but real time monitoring of rainfall by in-situ observation with telemetering and/or by weather radar and earth observational satellites are helpful.

The hydro-meteorological early warning system which has been developed on various scales, output examples and current performance will be introduced in the symposium.