Flood mapping and the variation of inundation area with the application of LID using FLO-2D model— a case study in Nanjing, China

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In China, riverine flooding has received special attention in the last decades whereas flooding in urban setting has not been given enough attention. With the acceleration of urbanization, large permeable land changing into impervious areas, urban waterlogging problems become increasingly prominent in Chinese cities. It is urgent to take non-structural and structural measures to mitigate urban flooding risk. Flooding hazard mapping and low-impact development (LID) are effective measures for urban inundation risk management. However, studies on flooding hazard mapping and LID started relatively late in China and there are few applications. This study applies a grid-based physical process, two-dimensional finite difference model named FLO-2D model to a district named Hexi in Nanjing where has suffered serious waterlogging problems in recent years, in order to simulate flood inundation and make flood hazard mapping in the current condition and in the scenario of applying some LID practices in this district. The current flood mapping shows that the flood vulnerability of some regions in the Hexi district is very high and the differences between the current flood mapping and the case with some LID practices indicate that LID practices are effective in stormwater runoff management. The study results suggest important implications for urban inundation risk management.

Key words: Urban inundation, Flood mapping, FLO-2D Model, LID