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Urban Flood Risk Mapping–a Review

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Abstract : Floods are one of the most frequent natural disasters, causing widespread devastation, economic damage and threat to human lives. Hydrologic impacts of climate change and intensification of urbanization are two root causes of increased flood occurrences, and recent research trends are oriented towards understanding these aspects. Due to rapid urbanization, population of cities across the world has increased exponentially leading to improperly planned developments. Climate change due to natural and anthropogenic activities on our environment has resulted in spatiotemporal changes in rainfall patterns. The combined effect of both aggravates the vulnerability of urban populations to floods. In this context, an efficient and effective flood risk management with its core component as flood risk mapping is essential in prevention and mitigation of flood disasters. Urban flood risk mapping involves zoning of an urban region based on its flood risk, which depicts the spatiotemporal pattern of frequency and severity of hazards, exposure to hazards, and degree of vulnerability of the population in terms of socio-economic, environmental and infrastructural aspects. Although vulnerability is a key component of risk, its assessment and mapping is often less advanced than hazard mapping and quantification. A synergic effort from technical experts and social scientists is vital for the effectiveness of flood risk management programs. Despite an increasing volume of quality research conducted on urban flood risk, a comprehensive multidisciplinary approach towards flood risk mapping still remains neglected due to which many of the input parameters and definitions of flood risk concepts are imprecise. Thus, the objectives of this review are to introduce and precisely define the relevant input parameters, concepts and terms in urban flood risk mapping, along with its methodology, current status and limitations. The review also aims at providing thought-provoking insights to potential future researchers and flood management professionals.

Keywords : flood risk, flood hazard, flood vulnerability, flood modeling, urban flooding, urban flood risk mapping
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