Risk Analysis of Flood Physical Vulnerability in Residential Areas of Mathare Nairobi, Kenya

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Abstract : Vulnerability assessment and analysis is essential to solving the degree of damage and loss as a result of natural disasters. Urban flooding causes a major economic loss and casualties, at Mathare residential area in Nairobi, Kenya. High population caused by rural-urban migration, Unemployment, and unplanned urban development are among factors that increase flood vulnerability in Mathare area. This study aims to analyse flood risk physical vulnerabilities in Mathare based on scientific data, research data that includes the Rainfall data, River Mathare discharge rate data, Water runoff data, field survey data and questionnaire survey through sampling of the study area have been used to develop the risk curves. Three structural types of building were identified in the study area, vulnerability and risk curves were made for these three structural types by plotting the relationship between flood depth and damage for each structural type. The results indicate that the structural type with mud wall and mud floor is the most vulnerable building to flooding while the structural type with stone walls and concrete floor is least vulnerable. The vulnerability of building contents is mainly determined by the number of floors, where households with two floors are least vulnerable, and households with a one floor are most vulnerable. Therefore more than 80% of the residential buildings including the property in the building are highly vulnerable to floods consequently exposed to high risk. When estimating the potential casualties/injuries we discovered that the structural types of houses were major determinants where the mud/adobe structural type had casualties of 83.7% while the Masonry structural type had casualties of 10.71% of the people living in these houses. This research concludes that flood awareness, warnings and observing the building codes will enable reduce damage to the structural types of building, deaths and reduce damage to the building contents.

Keywords : flood loss, Mathare Nairobi, risk curve analysis, vulnerability
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