

EGU22-9946, updated on 08 Aug 2022

<https://doi.org/10.5194/egusphere-egu22-9946>

EGU General Assembly 2022

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Mapping future exposure to multiple hazards in Tomorrow's Cities: the Khokana, Kathmandu, Nepal case study

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Exposure to multiple hazards can create many risks, including some related to human life and physical infrastructure. Therefore, it is important to develop approaches for characterising and controlling future urban development in a risk-informed manner. Towards this aim, this study develops a future risk-sensitive exposure-mapping methodology using the Khokana area of Kathmandu (Nepal) as a case study. Characterisation of future exposure is carried out on the basis of literature reviews, a thorough review of three future urban development options prepared by the Kathmandu Valley Development Authority (KVDA), discussions with experts, and data obtained from recent detailed building and road assessment surveys of the existing urban system. This characterisation is then used, along with future multi-hazard intensity predictions, to create a risk-informed masterplan layout of buildings and infrastructure that appropriately balances the demands of an expanding population. The developed methodology forms the backbone of the urbanisation component within the Tomorrow's Cities Decision Support Environment, and can be generally applied to risk-sensitive urban planning in any context.