IDRiM Virtual Workshop
for Interactive Discussions between
Senior and Early-Career Scientists
23-24 September 2020 | Online Workshop
FOR A SAFER WORLD

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[Abstract Title]

Disaster Risk Reduction (DRR) by Spatial Planning in Egypt: Multidimensional Vulnerability Assessment Using Principal Component Analysis (PCA)

[Abstract]

Spatial planning has great potentials in DRR from natural hazards by disentangling the conditions that make people vulnerable to the hazard's impact. Though the globally ascending recognition of the spatial planning role in this endeavor, the followed planning practices in the developing countries rarely contribute to DRR. Thus, the planning process needs the support of risk analysis tools for decision making, which can be achieved by mainstreaming vulnerability assessment into the planning process. This paper aims at applying an objective, systematic and multidimensional vulnerability assessment for Alexandria city that supports the spatial planning in DRR. PCA was used to conduct an assessment that includes the physical, social, and economic dimensions by utilizing institutional databases (e.g. census and city's physical geodatabase) on the smallest administrative units. As a result, PCA utilized 38 indicators distributed on the vulnerability dimensions. El-Gomrok neighborhood contains the units with the highest vulnerability. Objective methods increase the transparency related to the results and the decisions that follow. The available

institutional databases were found to be sufficient for constructing the needed indicators to conduct the assessment. Since PCA was attributed to communication difficulties, mapping the individual components was found to appropriate to increase the clarity.

[Keywords]

spatial planning, Disaster Risk Reduction (DRR), mainstreaming, vulnerability assessment, Principal Component Analysis (PCA).