Tropentag, October 5-7, 2011, Bonn

"Development on the margin"

Assessing Social Vulnerability to Seismic Hazard through Spatial Multi Criteria Evaluation in Bantul District, Indonesia

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Abstract

This research aims to test the spatial multi criteria evaluation (SMCE) feasibility for social vulnerability assessment in seismic prone areas of Bantul, Indonesia. The research area experiences at least these spatial problems **(1)** seismic hazard and **(2)** rapid land conversion **(3)** dominated by low income group. Bantul District experienced 6.2 Mw earthquakes in May 27th, 2006 which caused damages to nearly 80 % out of the 508 km^2 total area. It happens as home to nearly 823.000 people whom predominantly earn low to medium income from agriculture and non-agriculture sector. Additionally, there is rapid land conversion due to rapid population growth, urbanisation and transition from agriculture based economy to industrial based economy. The research method applies SMCE or spatial analysis application that allows diverse input criteria and operates through problem tree analysis, standardisation, weighting, lastly map generation. Herein, social vulnerability towards seismic hazard refers to pre-existing condition of being unfavourable due to seismic hazard expressed on a scale from 0 (no loss/damage) – 1 (lethal/full damage) within specified time. The research has revealed five findings, *i.e.* (1) social vulnerability indices are spatially quantifiable using SMCE, (2) the generated "deterministic what-if scenarios" built upon five criteria, *i.e.* physical, demography, social-economic, losses and hazard, (3) six scenarios distinguish the research area into moderately vulnerable, vulnerable and highly vulnerable indices, (4) social economic as sensitive criteria, and (5) weighting modification indicates result consistencies. In summary, the social vulnerability assessment using SMCE potentially stirs up better and safer future development plan albeit critically falls into ecological fallacy.

Keywords: Indonesia, seismic, social, spatial multi criteria, vulnerability

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