

Vulnerability of Norwegian Municipalities to Natural Hazards

Ivar S. Holand

Department of Geography, NTNU, Norway

Ivar.S.Holand@hint.no

Päivi Lujala

Department of Economics, NTNU, Norway

Paivi.Lujala@svt.ntnu.no

Jan Ketil Rød

Department of Geography, NTNU, Norway

Jan.Rod@svt.ntnu.no

Abstract

The aim of this analysis is to reveal geographical variability in social vulnerability to natural hazards in Norway. Natural hazards are spatial and social phenomenon – they threaten particular places, and certain people and social groups more than others. A hazard is more likely to be disastrous when people affected are vulnerable (susceptible to harm). The vulnerability of a place is therefore not only determined by its hazard exposure, but also the inhabitants' social vulnerability – the social factors that influences people's susceptibility to harm and ability to respond, and characteristics of the place (e.g. urban/rural).

We adopt S. L. Cutter and her group's method of measuring social vulnerability, where statistical indicators of factors that amplify or reduce vulnerability, are collected and brought together in a factor analysis. The analysis reduces the complexity of the data material, and reveals underlying dimensions of social vulnerability. The result of the analysis is expressed in a social vulnerability index (SoVI). To adapt the method for the Norwegian case, we revisit social vulnerability concepts and commonly used indicators. Furthermore, we discuss methodological issues concerning the adaptation of SoVI, and other viable approaches.

We construct indexes for socioeconomic and built environment vulnerability. The indexes are mapped for visual inspection and interpretation of regional patterns. Using the maps we are able to identify regions with high vulnerability on both indexes or on one of them. Results reveal (with some notable exceptions) a core-periphery pattern of socioeconomic vulnerability and a pattern of built-environment vulnerability where the largest cities and the remotest municipalities come out worst.

Keywords: *Social vulnerability, natural hazards, indicators, factor analysis, GIS, Norway*