

Título: Design and implementation of a voluntary collective earthquake insurance policy to cover low-income homeowners in a developing country

Ficha No. 27

RESUMEN

Understanding and evaluating disaster risk due to natural hazard events such as earthquakes creates powerful incentives for countries to develop planning options and tools to reduce potential damages. The use of models for earthquake risk evaluation allows obtaining outputs such as the loss exceedance curve, the expected annual loss and the probable maximum loss, which are probabilistic metrics useful for risk analyses, for designing strategies for risk reduction and mitigation, for emergency response strategies and for risk financing. This article presents, based on probabilistic risk models, the design and implementation of a risk transfer instrument to cover the private buildings of the city of Manizales, Colombia. This voluntary collective instrument provides financial protection to both, the estate-tax payers and the low-income homeowners through a cross subsidy strategy; besides, it promotes not only the insurance culture but also the solidarity of the community. The city administration and the insurance industry are promoting this program using the mechanism of the property-tax payment. This collective insurance helps the government to access key resources for low-income householders recovery and improve disaster risk management at local level.

Design and implementation of a voluntary collective earthquake insurance policy to cover low-income homeowners in a developing country

Mabel C. Marulanda¹, Ossa D. Cardona¹, Miguel G. Mora² and Alex H. Barbat³

Abstract. Understanding and evaluating disaster risk due to natural hazard events such as earthquakes creates powerful incentives for countries to develop planning options and tools to reduce potential damages. The use of models for earthquake risk evaluation allows obtaining outputs such as the loss exceedance curve, the expected annual loss and the probable maximum loss, which are probabilistic metrics useful for risk analyses, for designing strategies for risk reduction and mitigation, for emergency response strategies and for risk financing. This article presents, based on probabilistic risk models, the design and implementation of a risk transfer instrument to cover the private buildings of the city of Manizales, Colombia. This voluntary collective instrument provides financial protection to both, the estate-tax payers and the low-income homeowners through a cross subsidy strategy; besides, it promotes not only the insurance culture but also the solidarity of the community. The city administration and the insurance industry are promoting this program using the mechanism of the property-tax payment. This collective insurance helps the government to access key resources for low-income householders recovery and improve disaster risk management at local level.

Keywords: Seismic risk insurance instruments, earthquake risk model, probable maximum loss, expected annual loss, risk premium, cross-subsidy strategy

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PALABRAS CLAVE	Seismic risk insurance instruments, earthquake risk model, probable maximum loss, expected annual loss, risk premium, cross-subsidy strategy

COMPONENTES DE LA EVALUACIÓN

AMENAZA	<ol style="list-style-type: none"> 1. Tipo de amenaza: sismo 2. Métricas de intensidad: Peak Ground Acceleration (PGA) 3. Escala/resolución: Local 4. Resultados: - 5. Localización: Manizales, Colombia 6. Metodología: ERN-AL (2009), AIS (1996), Bernal et al (2015) 7. Períodos de retorno (años): -
VULNERABILIDAD	<ol style="list-style-type: none"> 1. Tipo de vulnerabilidad: Física 2. Metodología: Analítica. Cardona et al. (2008 a/b/c/d) 3. Tipología estructural: Adobe, bahareque, mampostería, industrial, prefabricado, muros y losas en concreto, pórticos en concreto 4. Representación: Función de vulnerabilidad; PGA vs. Valor esperado de la pérdida.
EXPOSICIÓN	<ol style="list-style-type: none"> 1. Tipo exposición: Edificaciones 2. Portafolios: Inmuebles privados 3. Localización geográfica: Manizales, Colombia 4. Valor de reposición total: COP (Millones) 3.115.050 5. Área expuesta (m2): -
RESULTADOS DE RIESGO	<ol style="list-style-type: none"> 1. Modelo utilizado: Sistema RN-COL 2. Métricas de riesgo: Pérdida Anual Esperada (PAE), Pérdida Máxima Probable (PML) 3. PAE: 1.982 ‰ 4. PML: 100, 500, 1000, 1500 años de Período de retorno 5. Representación del riesgo: Curva de excedencia de pérdidas, Mapas de pérdida anual esperada