FICHAS BIBLIOGRÁFICAS - ESTUDIOS PROBABILISTAS DE RIESGO EN COLOMBIA

Título: Probabilistic seismic risk assessment for comprehensive risk management: modeling for innovative risk transfer and loss financing mechanisms

Ficha No. 39

RESUMEN

A specific catastrophic risk model has been developed to evaluate, building by building, the probabilistic losses and pure premiums of different portfolios, taking into account the seismic microzonation of cities. Understanding probable losses and reconstruction costs due to earthquakes creates powerful incentives for countries to develop planning options and tools to cope with risk, including allocating the sustained budgetary resources necessary to reduce those potential damages and safeguard development. This model has been used to evaluate the fiscal contingency liabilities of the government and to build an optimal structure for risk transfer and retention, considering contingent credits, reserve funds, insurance/reinsurance, and cat bonds. In addition, an innovative insurance mechanism has been implemented for private housing, using the estate-tax payment and covering the all low-income homeowners through cross subsidies. Lastly, the model allows the evaluation of an exceedance probability curve of cost-benefit ratio, providing an innovative and ground-breaking tool for decision makers to analyze the net benefits of the risk mitigation strategies, such as earthquake retrofitting and seismic code enforcement. This paper describes the model and the derived abovementioned tools, using the results of loss scenarios and the strategies implemented in some earthquake prone urban centers.

PROBABILISTIC SEISMIC RISK ASSESSMENT FOR COMPREHENSIVE RISK MANAGEMENT: MODELING FOR INNOVATIVE RISK TRANSFER AND LOSS FINANCING MECHANISMS

AUTOR / ES	O.D. Cardona, M.G. Ordaz, L. Yamín, S. Arambula, M.C. Marulanda, A. Barbat
AÑO	2008
INSTITUCIÓN / REVISTA / ORGANIZACIÓN / EDITOR	The 14th World Conference on Earthquake Engineering
PALABRAS CLAVE	Seismic risk, building damage, insurance mechanisms, cost-benefit analysis, contingent liabilities

COMPONENTES DE LA EVALUACIÓN

AMENAZA	1. Tipo de amenaza: sismo 2. Métricas de intensidad: Peak Ground Acceleration (PGA) 3. Escala/resolución: Local 4. Resultados: Tasas de excedencia en roca para diferentes períodos estructurales 5. Localización: Bogotá, Manizales, Colombia 6. Metodología: Esteva (1970), Ordaz (2000). 7. Períodos de retorno (años): -
VULNERABILIDAD	1. Tipo de vulnerabilidad: Física, humana 2. Metodología: Analítica. Miranda (1999), Ordaz (2000) 3. Tipología estructural: Adobe, bahareque, mampostería, bodegas, madera, iglesia 4. Representación: Función de vulnerabilidad; PGA / Deriva máxima de entrepiso vs. Valor esperado de la pérdida
EXPOSICIÓN	1. Tipo exposición: Edificaciones 2. Portafolios: Residencial, comercial, industrial, institucional, oficial, sin edificar 3. Localización geográfica: Bogotá, Manizales, Colombia 4. Valor de reposición total: - 5. Área expuesta (m2): -
RESULTADOS DE RIESGO	1. Modelo utilizado: Ordaz et al. (1998), Ordaz (2000), Arámbula et al. (2001) 2. Métricas de riesgo: Pérdida Anual Esperada (PAE), Pérdida Máxima Probable (PML) 3. PAE: - 4. PML: - 5. Representación del riesgo: Curva de excedencia de pérdidas