

Sound Practice No.3

A Disaster Management Indicator System for Bogotá City

Overview

Aiming at guiding the decision making at urban level, a methodology is developed to estimate Risk and Disaster Risk Management in the city of Bogotá. It makes use of a multidisciplinary approach that takes into account the expected physical damage, the number and type of casualties or the economic losses, but also social, organizational and institutional factors, such as social fragility and the lack of resilience of the exposed community. Damage scenarios previously developed for the city are used in conjunction with a set of indicators to develop this urban approach as part of the IADB-IDEA Indicators for Disaster Risk Management Project.

Risk is defined as the potential economic, social and environmental consequences of hazardous events that may occur in a specified area and period of time. Multi-criteria evaluation of holistic risk based on indicators or indices allows the involvement of different perspectives and has been recently recommended and applied by different specialists for the purpose of reformulating public policies regarding prevention and risk. The hierarchical or structural analysis of the variables (by means of indicators) is used to determine the impact or influence of each variable on all of the rest for the purpose of determining its “weight” or importance using matrices of relationships. This activity is done by taking into account the opinion of experts or different social actors.

The purpose of multi-criteria modeling is to identify the status of the system before the hazardous event occurs. This status is characterized by the instabilities or the “vulnerability” that may lead the system to crisis. It represents the risk of the human settlement that may be interpreted as the initial conditions on which the response of the system depends when it is perturbed by any hazard.

This methodology was applied to estimate the contribution of each of the 19 administrative units to Bogotá's overall risk, a separate value was obtained for each one of them by aggregating the physical seismic risk index with the context seismic risk index.

Risk indicators can be disaggregated into their components to help understanding which are the factors that are contributing more to the overall risk in the specific geographical unit and lead to the implementation of concrete actions to improve that condition. The model allows monitoring to evaluate the effectiveness of the measures implemented. The disaster risk management plan implemented in Bogotá incorporates this methodology to introduce realistic correctives to the system.

Relative Seismic Risk Indexes

Physical Risk	Context Seismic Risk	
	Seismic Hazard	Vulnerability
Damaged area by the Eq.	Spectral acceleration Short T	Exposure
Number of death	Soft soil areas	Population
Number of Injured	Liquefaction susceptibility area	Population density
Rupture of water mains	Landslide susceptibility area	Built area
Rupture of gas networks		Industrial area
Fallen lengths of HT power lines		Government Institutions area
Telephone exchange affected		Social Fragility
Electricity substations affected		Slums
		Mortality rate
		Delinquency rate
		Social disparity index
		Lack of Resilience
		No. of hospital beds
		Health human resources
		Shelters and public space
		Rescue teams
		Level of Development
		Preparedness, Emergency Plans

Knowledge Base Coding Reference:

Name of the Practice: A Disaster Management Indicator System for Bogotá City

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