Guidelines for the design of a unit of urban risk prevention for subsurface fracturing in the Municipality of Iztapalapa in Mexico City

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Abstract  The aim of the work is to propose the creation of a unit of prevention of urban risk caused by land subsidence (UPUR-LS) in some areas of Mexico City. The unit of prevention is based on the identification of risks and factors of risk related to the land subsidence phenomenon, the analysis of the probability of occurrence and the quantification of its impact on the urban infrastructure. The applied methodology is a combination of two powerful tools: the systems approach and the risk management model. The former assumes that a system is a group of elements related by a common objective. This approach considers the whole system, its parts (subsystems) and the interactions between them, with the system, and from the system and the environment. The analysis should be addressed so as to improve the system itself. In contrast, the risk management model is a tool used to identify, evaluate and classify a group of risks that can modify the capacity for achievement of specific goals by institutions and organizations. With the integration of both methodologies we have created a conceptual model that permits the evaluation of hazards caused by land subsidence and fracturing and their socio-economic impacts. The analysis of several study cases in the Delegación Iztapalapa of Mexico City permitted the identification of factors of risk and the quantification of their impact on the society. The results obtained led to the design of the UPUR-LS that considers the administrative structure of a governmental agency as a “system” to be improved, and the technical results generated by the Center of Monitoring of the Fracturing of the Subsurface, already created in the Delegación Iztapalapa. Using this method the technical results of monitoring can be managed to optimize the human and economic resources of the governmental agency, to elaborate a guide for procedures, and facilitate the decision making for the creation of mitigation strategies.

Keywords risk management; strategy; social impact