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Method for assessing the vulnerability of buildings to flooding in a context of property insurance. The case of Le Pâquier (Fribourg,Switzerland)

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The vulnerability has a direct influence on the concept of risk. Yet, in the literature, its definition may vary. In this study, the vulnerability was related to the fragility of an object. It represents the degree of damage can have an object depending on the intensity of a hazard. One of the objectives of this work was to define and explain the underlying concepts. In a context of building insurance, it is a determining factor heavily influencing the amount of damages. It is also a frequent topic for insurance companies because it is among the causes of the increase in damages related to natural disasters.

This study seeks to illustrate the theoretical vulnerability concepts by an application to flooding of buildings. For that, a study area with highly diversified buildings was chosen, namely the village of Le Pâquier in the Canton of Fribourg, Switzerland. The field investigations consist in visits of buildings and were documented by numerous photographs. An entry interface and a database, including all vulnerable parts of the buildings, have been developed to facilitate data collection and to allow the assessment of risk. Hazard, exposure and the value of property are included provided by existing hazard maps and building insurance data in this reflection to consider an integrated management of risk. A series of flood scenarios was made to the field study. A GIS application was also developed to link the database and geographical data.

The results are developed in the form of vulnerability curves for each building including the intensity of the hazard and ratio of damages. It is also possible to estimate the amount of insurance values affected by a given event.