



## **Appraisal of damage and quali-quantitative risk assessment in environmental disaster.**

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The most of damage deriving from environmental disaster are due to character of unpredictability of human-natural interaction . Damage assessment cannot avoid interaction and integration of those aspects (physical, environmental, economic, social, political, technical, ideological, ecological, institutional, educational, health-related, cultural) that are not able to be described by linear mathematical combinatory models which cover a fundamental and strategic role both in prevention, protection and reconstruction after the disaster, and in spatial planning and management. For this reason a model of potential damage estimate in a sub-regional scale has been developed, by the use of a qualitative approach. That model, starting from the identification of the existence and the consistency of spatial factors (considered as affecting vulnerability and hazard) in a given area of study, by a multicriterial evaluation combined with a spatial selection operated by overlay mapping, provide information about systemic vulnerability and risk, in a territorial meaning, by the evaluation of quali-quantitative factor complementarities. The aim is to enlarge with the use of GIS and MCA (multicriteria analysis) the field of application of QRA (quantitative risk analysis, such as defined by Øien), covering aspects that usually are discarded due to their un manageability in traditional QRA Models.

### References

- ‡ T. L. Saaty, (1980) *The Analytic Hierarchy Process*, McGraw-Hill, New York  
‡ S. Menoni, (1996) *Pianificazione e incertezza. Elementi per la valutazione e la gestione dei rischi territoriali*, FrancoAngeli, Milano.  
‡ Villagrán De León, J. C. (2006): *Vulnerability, A Conceptual and Methodological Review*. In *SOURCE 'Studies of the University: Research, Counsel, Education'*, Publication Series of UNU-EHS n. 4/2006.