



Ambiguity analysis and knowledge co-production in flood risk management: some hints from the Glinščica river basin (Slovenia)

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Across Europe floods have affected communities, environmental systems, urban areas and economic activities. Climate disruption and land use change are impacting on the hydrological system at the same time that growing populations and infrastructures create much greater dependence upon it. Around 20% of European cities are classified as being vulnerable to flood. Therefore, defining and implementing effective flood risk management strategies is of utmost importance. Nevertheless, evidences demonstrate how difficult is to determine how effective a risk management policy will be. Part of the difficulty resides in the fact that even when a policy is targeted to regulate the behaviour of individual, actors are interdependent in performing their tasks, so any action choice will influence and be influenced by the actions choices of the other actors. Action choices are not neutral, but commensurate with the perspectives and frames held by the actors making the decisions. The problem is that when these frames do not overlap or are incompatible, they lead to a situation of ambiguity. In multi-actors setting the presence of ambiguity is unavoidable, but it could have a twofold implication. On the one hand, a diversity in frames can offer opportunities for innovation and the development of creative solutions. On the other hand, the presence of ambiguity can be a source of discrepancies or conflict in a group. In this work, we argue that making the decision actors aware of the existence of ambiguous problem framing is the key to enable creative and collaborative decision-making processes. To this aim, a methodology based on Fuzzy Cognitive Mapping (FCM) has been developed and experimentally implemented in the Glinščica river basin (Slovenia). The methodology allowed us to elicit and structure stakeholders' risk perception, to compare the different mental models, and to assess ambiguity in risk perception. The results of the ambiguity analysis were used to enable the debate involving the main stakeholders, aiming at facilitate the alignment of the different problem frames. A Social Fuzzy Cognitive Map was developed. The model was capable to qualitatively assess the potential stakeholders' reactions in case of risk, and to evaluate the impacts of stakeholders' actions/reactions on the effectiveness of flood risk management strategies. To this aim, different risks and policy scenarios were developed using the Social FCM and discussed with local stakeholders.