Exploring the Role of Social Memory of Floods for Designing Flood Early Warning Operations

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Early warning systems are an important tool for natural disaster mitigation practices, especially for flooding events. Warnings rely on near-future forecasts to provide time to take preventive actions before a flood occurs, thus reducing potential losses. However, on top of the technical capacities, successful warnings require an efficient co-ordination and communication among a range of different actors and stakeholders. The complexity of integrating the technical and social spheres of warning systems has, however, resulted in system designs neglecting a number of important aspects such as social awareness of floods thus leading to suboptimal results. A better understanding of the interactions and feedbacks among the different elements of early warning systems is therefore needed to improve their efficiency and therefore social resilience.

When designing an early warning system two important decisions need to be made regarding (i) the hazard magnitude at and from which a warning should be issued and (ii) the degree of confidence required for issuing a warning. The first decision is usually taken based on the social vulnerability and climatic variability while the second one is related to the performance (i.e. accuracy) of the forecasting tools. Consequently, by estimating the vulnerability and the accuracy of the forecasts, these two variables can be optimized to minimize the costs and losses. Important parameters with a strong influence on the efficiency of warning systems such as social awareness are however not considered in their design.

In this study we present a theoretical exploration of the impact of social awareness on the design of early warning systems. For this purpose we use a definition of social memory of flood events as a proxy for flood risk awareness and test its effect on the optimization of the warning system design variables. Understanding the impact of social awareness on warning system design is important to make more robust warnings that can better adapt to different social settings and more efficiently reduce vulnerability.