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Communicating the unexpected – the fable of the lay foible and some other issues resulting from research in Alpine watersheds

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The procedure of risk assessment emerged as an appropriate tool to assess the impacts on communities exposed to natural hazards. However, despite from a considerable amount of national approaches and guidelines, as well as the European Flood Risk Directive, only little work has been carried out with respect to the information necessary to increase the resilience of citizens and decrease the vulnerability of affected communities, in particular with respect to European mountain regions.
From a technical point of view, conventional structural mitigation is regularly combined with hazard mapping to reduce the adverse effects on the built environment. As such, an individual responsibility of the citizens affected was not necessary in the past, since such measures were provided by the public administration and prescribed in land use planning regulations. However, against the development of losses in recent years it seems that a decrease in vulnerability, and consequently an increase in resilience, needs a strong involvement of the population exposed. In this regard, it had been repeatedly claimed by the public administration that laypeople may not understand their risks due to a particular gap in technical knowledge on hazards and risk and a misinterpretation of probabilities behind the design scenarios applied. Furthermore, affected citizens were thought to misinterpret hazard maps and may therefore not be able to take necessary actions in vulnerability reduction.
Acknowledging these assumptions, two European projects were implemented to better understand the quality of information necessary for a stakeholder-oriented risk communication.
Within the RISKCATCH project, risk maps were created for catchments located in
the European Alps and the related forelands. Based on the assessment of historical and possible future development of flood hazard scenarios, elements at risk exposed and vulnerability, these maps were created on different scales using scenario techniques. The information created was evaluated by presenting the maps to several stakeholder groups, above all political decision makers, practitioners and laypersons from European countries. The method used was based on the approach of experimental graphic semiology, reversing the traditional top-down communication pattern from transmitter to receiver. Starting from receiver, the maps were presented to the test persons using an ophthalmic device for the record of eye movements during picture reading. The eye-tracking test was accompanied by a specific survey; hence, the cognitive perception of risk maps was evaluated. All maps were presented to the test persons for a relatively short time period to identify the most attractive components of each map. The eye movements were subsequently statistically analysed in order to assess patterns of visual perception for each map and to study the reading behaviour for text elements included in the maps. The visual strategies of each test person were quantified.
A successor of this project was RISK MAP; the main objective of this project was to contribute to the enhancement of community resilience by improving flood risk maps. To reach this overall objective RISK MAP refrained from the assumption that risk maps are only a means to inform citizens about future risks. In contrast, they are also a possible way to stimulate public participation between governmental institutions, private companies and associations, alliances, interests groups, and citizens. An increased public participation, in turn, leads to a decreased vulnerability to floods, and may therefore contribute to the ongoing discussion on appropriate risk management strategies beyond technical mitigation.
The three central objectives addressed in both projects were
(1) to develop recommendations for an appropriate stakeholder participation process which allows to incorporate local knowledge and preferences;
(2) to improve the content of flood risk maps by considering user-specific needs; and
(3) to improve the visualisation of risk maps in order to produce user-friendly and understandable risk maps for different e concerned.
The main result – apart from the technical issues on visualisation and stakeholder participation – was that in general, the citizens affected by flood hazards were not as unaware and amateurish as it had been repeatedly

reported by the public administration.
Both studies resulted in guidelines of how to deliver information on natural hazard risk in a way that it will be accessible for different stakeholders, in particular with respect to visual information contained in risk maps. Moreover, the results of both projects confirmed earlier European attempts with respect to recommendations on the content of flood maps for different user groups. As such, if the mapping process is adjusted to these findings, flood resilience of citizens will increase and simultaneously, the vulnerability of affected communities will decrease.