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Alternation in perception and evaluation of flood risks due to global change

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The Vipiteno Basin, Autonomous Province of Bolzano, Italy is situated on the confluence of the three alpine rivers Isarco, Rio Vizze and Rio Mareta. In the past, these rivers caused numerous flood events with considerable damage to infrastructures, settlements and roads. Today, the Rio Mareta causes repeatedly interruptions of the Brennero Motorway that is one of the most frequented motorways leading through the Alps. In addition, the industrial zone of Vipiteno had been grown significantly towards the area potentially affected by floods. An integral project including an analysis of historical flood events as well as a geomorphologic assessment was conducted by the authorities to understand the environmental system causing extreme discharges. Information about multiple destruction of the settlement goes back to 1080 A.D. Furthermore, time periods with a very high frequency of damaging events alternated with periods without floods. Until 1873, the citizens of Vipiteno encountered the flood events with local protection measures, locking with auxiliary fixtures ground floor and cellar entrances and refused to get engineering solutions because of the influence to the local economic structure. Yearly flood events and an associated water table rise induced a change of the perception and the acceptable risk due to floods and resulted in the planning and construction of river regulation measures.

The same observations can be made in the last decades. Until the local industry was targeted to the regional and national market and the relevance of the Brennero transit route was relatively small, an interruption of production and traffic of a few days every three to five years was accepted. Nowadays, the integration of small alpine cities with the international market leads to an increasing of indirect damages and a shrinking degree of acceptance for natural events. The interruption of an important international transit route is not accepted. The study showed that frequent flooding of the city of Vipiteno was accepted for a long time period. Once flood events increased significantly

in frequency during the first two decades after the “little ice age”, the consequences of floods were not accepted anymore. This leads to the conclusions that in periods of changing environmental systems the habit of economic life becomes disrupted. Thus, potential changes in the environmental system due to global warming could lead to similar changes in risk perception and have to be assessed precautionary.