



Estimating regional long-term economic consequences of natural hazards - a case study of the 2005 flood event in Tyrol (Austria)

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The interaction of relief-driven alpine natural processes with the anthropogenic sphere often leads to natural disasters which significantly impact on remote alpine economies. When evaluating the effects of such events for future risk prevention strategies, it is essential to assess indirect losses. While the economic measurement of direct effects - the physical impact on structures and infrastructure - seems fairly manageable, less is known about the dimensions of indirect effects, especially on a local and regional scale within the Alps. The lack of standardized terminology, empirical data and methods to estimate indirect economic effects currently hampers profound decision support.

In our study of the 2005 flood event in Tyrol, we surveyed companies from all sectors of the economy to identify the main drivers of indirect effects and interrupted economic flows. In collaboration with the Federal State administration, we extrapolate the total regional economic effects of this catastrophic event. Using quantitative and qualitative methods, we established and analysed a data pool of questionnaire and interview results as well as direct loss data. We mainly focus on the decrease in value creation and the negative impacts on tourism. We observed that disrupted traffic networks can have a highly negative impact, especially for the tourism sector in lateral alpine valleys. Within a month, turnover fell by approximately EUR 3.3 million in the investigated area. In the short run (until August 2006), the shortfall in touristic revenues in the Paznaun valley aggregated to approx. EUR 5.3 million. We observed that overnight stays rebound very quickly so that long-term effects are marginal. In addition, we tried to identify possible economical losers as well as winners of severe hazard impacts. In response to such flood events, high investments are made to improve disaster and risk management. Nearly 70% of the respondents specified the (re)construction sector and similar businesses as main beneficiaries and about 40% mentioned infrastructural improvements, as in streets or protective measures, as the most positive effect.

We present an empirical approach to assess the economic consequences of fatal events and provide rules of thumb to quickly estimate indirect economic losses from natural disasters, at least for the Alpine Space, at the local and regional level. The methods and results of this study can help to improve ex-post loss estimations, and with it, ex-ante methods for the cost efficiency of risk reduction measures, e.g. cost-benefit-analysis.