



## **Beyond communicating risks: Findings from a field experiment testing the effectiveness of theory-driven interventions to promote response to environmental risks.**

Max Friedrich (1), Hans-Joachim Mosler (1), Andreas Kappler (2), and Jennifer Inauen (3)

(1) Eawag - Swiss Federal Institute of Aquatic Research, Environmental Social Sciences, Dübendorf, Switzerland (max.friedrich@eawag.ch), (2) University of Tübingen, Geomicrobiology, Centre for Applied Geosciences, Tübingen, Germany, (3) University of Bern, Health Psychology, Institut of Psychology, Bern, Switzerland

Geological processes, such as extreme weather phenomena, earth quakes or geogenic contamination of drinking water, can pose high risks for human welfare. Taking protective actions often involves accepting substantial costs now, in order to mitigate uncertain risks in the future. In this study, we examined the effects of an intervention to promote consumption of arsenic-safe drinking water in Bangladesh where approximately 20 million people are exposed to arsenic-contaminated and chronically toxic drinking water. Since arsenic-safe wells are sparse in many areas, drinking safe water implies high costs in terms of the expenditure of time for collecting it.

Existing research shows that building knowledge and creating risk awareness does not necessarily prompt individuals to engage in protective behaviours. Congruently, published results of an RCT to promote arsenic-safe water consumption show only small effects of an information campaign (10% behaviour change), as compared to 45% behaviour change which was triggered by a combination of information, reminders, daily routine planning and public pledging.

The first aim of this study was to examine whether high costs, in form of the expenditure of time for water collection, actually prevent people from using safe wells. The second aim was to test whether the interventions were effective in overcoming this barrier of high costs.

Data were obtained during a field experiment conducted with 340 households in Monoharganj, Bangladesh. The implemented interventions, namely information, reminders, daily routine planning and public pledging, were selected according to the risks, attitudes, norms, abilities and self-regulation (RANAS) model. Data were collected in two panel surveys in 2010 through face-to-face interviews employing standardized quantitative questionnaires. Main outcome of the study was self-reported use of arsenic-safe water.

Baseline data yielded a strong negative correlation between the consumption of safe water and the time needed to collect it. This identified costs in the form of the expenditure of time as major barrier preventing arsenic-safe water consumption. Comparing participants who adopted safe-water consumption to those who did not yielded no difference in their expenditure of time. This shows that the interventions effectively overcame this barrier.

The results show that the interventions triggered substantial behaviour change in a situation in which, among other factors, high costs had prevented individuals to react to a severe geogenic risk. Prompting individuals to respond to uncertain environmental risks despite high costs is an urgent necessity in many spheres and our results indicate a huge potential for behaviour change that can be leveraged with such simple and low-cost interventions. Future studies should, first, investigate the extent to which perceived costs as compared to risk awareness matter for the perception of other controversial geological topics and, second, test how to effectively complement risk messages in order to achieve maximum impact of communication campaigns.