

Tony Rosqvist (VTT, Fin) - Group Decision Support Systems - its principles and an application to a flood risk reduction case

Tony Rosqvist

VTT Technical Research Centre of Finland  
Finland

Adriaan Perrels

Finnish Meteorological Institute (FMI)  
Finland

A group decision-making exercise was organized in 2008 as part of an integrated assessment of selected extreme weather events in Finland (TOLERATE [1]). The exercise focused on the case of flood risks in Pori, a city near the West-coast of Finland situated on both sides of the Kokemäki river. Risk information was obtained from the TOLERATE study and presented to the main stakeholders of flood protection decision-making. The stakeholders represented a fairly wide variety of national and regional public authorities, specialists in hydrology and urban planning, and a few interest groups (employers, home owners). The exercise had only a research function and no official status in formal flood protection planning procedures [2].

As input to the exercise, decision criteria and alternatives for flood protection were defined. Also some results of a pre-study of flood impacts (flooded real estate, cost, duration, etc.) of R50 and R250 floods were presented before the actual decision-making exercise. The criteria were related to the wellbeing of citizens and business, and the functionality of the infrastructure of the flood prone area. The alternatives ranged from dredging and building specific protection to the building of a new river arm. In the decision-making phase, first the effectiveness of the alternatives against the scales attributed to the criteria were assessed, then the relative weight of these criteria were elicited. The Group Decision Support System collected the ratings and valuations of the stakeholders and calculated the average performance levels of the studied flood protection alternatives and the weights of the criteria. Also the overall value (score) of the decision alternatives were calculated and shown as bar graphs for value comparison. Also a sensitivity analysis is possible, thereby showing the robustness of the results.

The presentation reviews briefly the approach used in the TOLERATE project. In particular the required information from the participants, the main modeling assumptions and the graphical results of the case study are highlighted.

Literature:

[1] Perrels, A., Veijalainen, N., Jylhä, K., Aaltonen, J., Molarius, R., Porthin, M., Silander, J., Rosqvist, T., Tuovinen, T. (2010), The Implications of Climate Change for Extreme Weather Events and their Socio-economic Consequences in Finland, VATT Research report 158

[2] Riitta Molarius, Adriaan Perrels, Markus Porthin, Tony Rosqvist (2008), Testing a Flood Protection Case by Means of a Group Decision Support System, VATT Discussion paper 449, Helsinki.