

## ***Interactive comment on “The connection between long-term and short-term risk management strategies: examples from land-use planning and emergency management in four European case studies” by K. Prenger-Berninghoff et al.***

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Dear Editor,

we are grateful for receiving a second opinion on our article from Mrs. Highland and would like to thank her for the useful comments made and suggestions provided. We do not want to miss the opportunity to also respond to the single points she raised.

With kind regards on behalf of all authors,

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K. Prenger-Berninghoff

General comments

"What is your goal in writing this paper? Is it a scholarly study incorporating all known papers on the topic, or is it to inform decision-makers? If the latter, the paper definitely needs to be much shortened with some of the comparisons and differences between the 4 case studies in tabular form."

The paper is considered a scholarly one that both, refers to already existing articles on the topic and tries to further elaborate the main problem based on own empiric research. Although it rather aims at addressing fellow researchers, decision-makers might still read the paper for his/her own interest.

"The paper would benefit by having more of the information in the form of your excellent Figure 3. The narrative is too wordy and dense, although the English is impeccable and descriptive. Many of the sentences could be shortened and/or re-organized."

We agree that the paper is rather long. We will therefore try to shorten some sentences or – if possible – summarize the main statements in another figure.

Specific comments

"In the absence of a section for keywords, the introduction and abstract should mention the topics of "flood" and "landslide" that are found in the rest of the paper. As it is now, floods and landslides are not even mentioned until page 8. Understandably, the topics of risk management and land-use are intra-hazard in nature, and perhaps most of the discussion can be generic, but all of the case studies you discuss involve flood and landslide, and to the extent that these are unique hazards in their own way, should be emphasized or at least prioritized in the discussion. The alternative is to add a keywords section. Suggest a different title (two examples follow): "Floods and landslide hazard mitigation in 4 European case studies of land-use planning: A comparison of long and short-term risk management" Or "The connection between long

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and short-term risk management: Land-use planning and case studies of flood and landslide hazards in 4 European locations (or, countries).” Hazards in general are different enough in their characteristics that you would want someone searching for flood and/or landslide hazards studies to be able to find this paper, if searching by title (again, there is no keywords section). A very short description of the CHANGES project would be helpful to the reader – either in footnote or within main text.”

We thank the reviewer for noticing the fact that we only mention the two hazards, floods and landslides, on p. 8 of the paper. The CHANGES project in fact exclusively focuses on floods (including river floods and flash floods) as well as mass movements such as landslides and debris flows. This is why all CHANGES study areas have a repeated occurrence of these two natural phenomena in common. (This does, however, not mean that the study areas are not exposed to hazards other than floods and landslides.) We therefore approve of the suggestion to add a short description of the CHANGES project in order to underline the focus of the project. We will also discuss the potential use of a keyword section as well as your proposals for a change of title. We certainly agree that the specific focus of the paper on these two particular types of hazards should be made apparent to the reader at the very beginning.

“Figures 4 and 5 – although much of the key/legend is understandably not legible as a figure in this paper, suggest that the color-codes should be legible to the reader. Alternatively, you could describe the colors and what they represent in the caption. (for example: “The blue areas indicates xxx, the pink indicates xxx and the white indicates xxx”). This is probably optional, but it would make the figures more interesting and informative. Also in figure 4, what comprises a “geomorphological hazard? You might add whether it is debris flows, floods, landslides. It looks like debris flows but not sure.”

We agree that a more descriptive caption through an explanation of the colour code is a good solution to make the figures more interesting, informative and understandable. The geomorphological hazard map covers all sorts of mass movements: rapid (debris/mud/earth) flows, falls, topplings, surficial slides and rotational/translational slides.

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Floods (river floods and flash floods) are part of the hydrological hazard map, while avalanches are part of a separate avalanche hazard map.

“Fig. 5 – what type of risk is the map illustrating? Probability? Susceptibility? Both? Add to figure caption.”

We will add to the figure caption that the maps of the Hydrological Management Plans (PAI) of the Friuli-Venezia-Giulia region are hazard maps and no risk maps. They display the hazard in 4 different categories: moderate, medium, high and very high. For the PAI in FVG the hazard is defined as “the probability that a phenomenon of a given intensity occurs within a certain period of time and in a given area potentially being damaged” (Autorità di Bacino Alto Adriatico, 2012). For example, the geological hazard is a combination of the potential frequency (high: 1-30 years; medium: 30-100 years; low: 100-300 years) and the classes of magnitude, which in turn is made up from values that describe the velocity and geometrical severity. The geological hazard map, in addition to the illustration of the hazard classes, gives an indication of the areas of hydraulic hazard, flood defenses, the elements at risk and areas of geological attention defined by the IFFI Project (Progetto inventario fenomeni franosi Italia (Italian landslide inventory)).

“ARCUS 2005 referred to on page 3162, should be explained – is it a GIS? Or other type of analytic tool? You describe what it does, but not what it is – In Figure 7, ARCUS 2005 is illustrated, which is a good idea–What kind of parameters go into it, for example, could be added in the caption. Also, what does the map show? The yellow squares look like infrastructure (?) and the red circle some type of boundary (?). It would be helpful to the reader to describe what the symbols and polygons are. Add the name of the country to the caption.”

We thank Mrs. Highland for her proposal to explain what ARCUS 2005 is. ARCUS 2005 is a forces and resources application and serves as a database. It is a software tool that is employed for emergency management purposes using elements of geo-

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graphic information systems (GIS). The application is used by emergency management services to illustrate the availability of emergency appliances and tools as well as personal forces. Originally it has been developed by the Wielkopolska Voivodship Office (Greater Poland voivodship). However, it has been licensed to many other administrative units in Poland, including the municipalities and districts in the Malopolska (Lesser Poland) voivodship. The map displays selected resources of the municipality marked with the flag. This involves elements such as infrastructure, hospitals, pharmacies, volunteer fire brigade stations, petrol stations, accommodation, clinics and primary health care etc. ARCUS 2005 allows for simultaneous illustration of all of the entities' and also prepares tables with data to be illustrated in the GIS application. Emergency services need to feed the system with content. All entities that have access to ARCUS 2005 can illustrate any content and display available resources and forces. We understand, that the figure should contain more information that helps explaining what the map is showing and illustrating. By providing more detailed information on the content of the map, readers might better understand the purpose of the software. We will also add the name of the country and location (the municipality of Smiegiel in the Wielkopolska region in Poland) to the caption.

"Figure 7 needs more information in the caption. Add what the map is illustrating. Saying it is System ARCUS 2005 only, leaves the reader wondering what it is showing. Add the name of the country that the map is illustrating, for those not familiar with European geography. Even though you describe Fig. 7 in the text, the caption needs a little more information. The conclusion section is much too wordy, and perhaps some bullets outlining main conclusions could be incorporated, to reduce the length of the descriptions. Many readers read only the abstract, introduction and conclusions of papers and these should virtually stand alone to inform the user of basic ideas. Some type of figure incorporating conclusion main ideas could be added to the paper, and referred to in the conclusions section."

We will try to shorten the conclusion section by maybe adding a figure and/or bullet

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points in order to save some space and to make main conclusion more easily readable and graspable for the readers.

Technical corrections

We thank the reviewer for these suggestions and we will correct or adjust them in the next version of the paper.

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