

## ***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 would like to express our thanks to the valuable review by the referee Mrs. Sapountzaki. The interactive comment has provided useful comments to improve the quality and scientific relevance of this paper. We appreciate the detailed analysis of the content of the paper as well as the methodological approach and use of specific terms. We are also thankful for the specific suggestions for improvement.

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In the following, we will comment on each of the points and problems raised in more detail. We will, however, wait for communication of the editor before uploading a new version of the manuscript.

With kind regards on behalf of all authors,

K. Prenger-Berninghoff

### 1. Validity of findings for extreme events other than hydro-geological risks

"However, what remains unclear in the paper is whether the analysis and results are valid in every case of sudden risk (i.e. trans-risk perspective). Since all case study areas suffer from hydrological risks and cascade hazardous effects, i.e. floods, mudflows and debris flows and landslides, the reader wonders about the validity of findings in case of other extreme events (e.g. earthquakes, forest fires, heat waves etc)."

We agree with Mrs. Sapountzaki that it would be useful and interesting to consider natural hazards in a more comprehensive way and also look at extreme events other than hydro-geological risks. The findings presented in this paper might potentially be valid for other extreme events (such as earthquakes, forest fires, heat waves etc.) as well, especially in cases where the risk prevention approach focuses on several hazards anyway. For example in France the PPR involves hazard assessments of ten different types of natural hazards, besides floods and landslides it also involves rock falls, earthquakes, forest fires etc. However, the CHANGES project itself was specifically focusing on hydro-meteorological hazards. That's why all of the case study sites that were part of the project were selected because of (more or less regularly) appearing floods and landslides. This is the one characteristic that all of the case study sites have in common and support the ability to make a cross-country comparison in the light of these types of hazards. This is also the reason why in this paper we specifically address only hydro-geological hazards. We suggest that examining whether these findings are also valid in case of other extreme events could maybe be a possible next step for future studies. Consequently, we will refer to this suggestion as an option for future research

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within the conclusions section.

## 2. Definition of key terms

"Another shortcoming of the theoretical section in particular, is that certain terms and notions that are widely used throughout the paper are not defined or specified appropriately with regard to their meaning and connotations in the context of the paper. A prominent example is the term "coordination" which is a key term in the paper while it is not considered in terms of its several dimensions. How is the term considered? - Solely as a process of information sharing / exchanging? - Additionally as a process of co-deciding? - Additionally as a process of co-acting, co-implementing, co-monitoring, co-feedback?"

We strongly agree with this remark. The meaning of the term "coordination" apparently was more or less taken as a given by considering but not limiting the term to the most basic dimension. That is starting from the information sharing/exchanging according to the competences in the risk management cycle. However, we also addressed in the discussion and conclusions the need to extend coordination towards more collaborative dimensions. That is by enhancing the interaction between risk managers for the evaluation and selection of risk management strategies towards achieving a common goal. Therefore, we agree on the need to explain the exact meaning and dimensions of the term in the revised version of the paper.

## 3. Important findings not mentioned in the conclusions

"Nevertheless empirical findings do not seem to having been accordingly elevated or turned to advantage for policy-making proposals. Examples of important findings that are not mentioned in the conclusions and have not functioned as a point of departure for proposals by the authors are the following:

a) Uncertainty regarding hazard and exposure location inhibits structural mitigation measures."

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We agree with the reviewer to further highlight this aspect in the conclusion section. The changing trends on land use patterns and migration of the populations have increased the uncertainty over the hazard and exposure location. This is also an aspect that requires exchange of information and collaboration of different actors involved in managing the risk. First, it is important to agree on the most plausible future scenarios risk managers may be dealing with. Then the risk management strategies need to be analyzed and selected in terms of their flexibility and performance on the different future scenarios considered. Therefore, the limited coordination between actors involved may limit the effect of policy-making proposals under changing conditions. We agree that this holds particularly true for structural mitigation measures. In situations in which there are already existing buildings and where available space is rather limited, coordination is crucial for finding the most effective solution when there is uncertainty regarding hazard and exposure location. Coordinating activities is essential in this case in order to find the best alternative.

b) "Risk mitigation may compete with other urgent objectives in the context of spatial planning and may lose this competition, i.e. by being considered as subordinate to other more urgent and serious socio-economic objectives."

This was indeed an important topic addressed in our interviews. At least according to the majority of mayors interviewed, risk mitigation apparently really seems to be one of the main issues dealt with in the examined municipalities. Mayors stated that the prevention of risks is considered as crucial. But since also other problems such as touristic development, outmigration, economic development and progress are main concerns, we agree that a reference to this finding should be made in the conclusions. An effective coordination would certainly be helpful in finding the most effective solution for the several urgent objectives in the context of spatial planning, including risk mitigation. The consideration of risk management strategies in a more holistic way may increase the complexity of the decision-making process. However, it may also legitimize the final decision, because the coordination process assists in revealing possible constraints for

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the decision's implementation.

c) "Radical spatial planning measures that are favourable to risk mitigation may be undesirable because they come in conflict with other important socio-economic objectives (e.g. relocation to less hazardous areas may boost further existing trends of out-migration of declining areas or regions)."

We agree with the reviewer on the need for highlighting this aspect. The consideration of other important socio-economic objectives may imply the need for compromising competing objectives. Therefore, spatial planning measures cannot be implemented stand-alone. Their implementation requires the awareness of decision-makers and population about hazard and exposure conditions for different planning strategies and thus also coordination between different actors and a coordinated decision-making process.

d) "Coordination, cooperation and interaction is a critical issue also for the relationship between spatial planning and other than risk management forms of sectoral planning (e.g. industrial, tourism, housing and other policies). This condition attributes an integrative element to spatial planning which however is not recognized in most countries at least at the level of formal policy-making."

Thank you as well for your suggestion regarding the consideration of coordination, cooperation and interaction between spatial planning and other forms of sectoral planning. We believe that this is a very important fact you are mentioning, which indeed constitutes an obvious problem in many cases. However, we did not refer to the overall role of spatial planning in regard to its integrative and comprehensive nature in relation to other forms of sectoral planning, because we were merely focusing on the actors involved in risk management and how to organize coordination between these actors more effectively. Therefore we decided not to further analyse and more deeply examine the role and status of spatial planning as compared to sectoral planning authorities in general. It will, however, be a part of further studies carried out within the context of

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this project, when more emphasis will be put on spatial planning as one of the actors.

e) "To a great extent risk and multi-risk production processes are realized at the local level (due to hazard interactions, manmade interventions and climate change) but these are not controllable locally because the respective competences lie at higher levels of administration. Hence, spatial distribution of risk mitigation needs more often than not is not compatible with the allocation of risk mitigation competences."

Although in this paper we do not specifically refer to vertical coordination, we agree that effective coordination is required not only between different actors at the same level of administration (horizontal coordination), but also between different levels of administration (vertical coordination).

f) "Lack of trust between the state (central and local) and the citizens and a diffuse culture of breaching spatial planning law in certain societies cancel usability of spatial planning as a long term risk mitigation strategy."

We believe it is important to acknowledge the problem of a possible lack of trust between the state and the citizens. This was indeed apparent in observing the difference in the level of trust between the public and the local level administrative bodies versus the public and the higher level administrative bodies. In some cases, the stronger relationship at the local level (e.g. stronger local actor network) results in an ineffective adherence to planning regulations. This proves problematic in encouraging the ability of spatial planning to function as a long term mitigation strategy. On the other hand, lack of trust, especially at the local level, lowers the effectiveness of spatial planning. This means that the goal of keeping hazard prone areas free of further development cannot be achieved if people mistrust local decision makers, ignore the law and build illegally. We thank Mrs. Sapountzaki for pointing out this important drawback and will make sure to explain the problem by providing some practical examples.

g) "Necessary preconditions for spatial planning to serve risk mitigation are multi-hazard and exposure mapping."

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We completely agree that such risk (or hazard-) related information is crucial for spatial planning to be used in planning- and decision-making processes. We did not further elaborate on this fact, since we believe this should best be addressed separately, when the focus is more on spatial planning alone. What we could do for the conclusions section, however, is to more clearly refer to and point out the importance of coordination and collaboration between spatial planning and sectoral planning authorities when it comes to the provision (and use) of information about hazards to be applied in the planning process.

h) "Above obstacles to coordination of spatial planning with risk management elevates real causes of the problem and difficulty to overcome it. In this sense there is a need of contextual changes to facilitate proper interaction between risk management and spatial planning. Contextual changes refer to administrative structures, education of planners, dissemination of risk information to the public etc."

As with the previous comments, we agree, that contextual changes are in fact a key necessity to facilitate interaction between all actors involved in risk management. We believe it is a good argument and should be referred to in the conclusions as a further solution to the problem of a missing coordination of activities (besides the facilitation of interaction using a GIS platform or an SDSS). For instance, the education and sensitization of planners goes hand in hand with a good coordination and an exchange of information between spatial planning and sectoral planning actors and could therefore be referred to in the same context as the previous point. We did not, however, include the public on purpose in our elaboration, because the general public is yet another (completely different) stakeholder to be considered. Extending our elaborations towards the local public would require a complete revision of the paper. We rather wanted to focus on actors that are somehow involved in decision-making. This is why we want to refrain from widening the focus and will not refer to the public as one of the stakeholders.

#### 4. Specific comments on the content, method, conclusions and references

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a) "As regards the methodology followed in empirical studies these are mentioned clearly but very briefly. In particular, the introduction mentions expert interviews and stakeholder meetings conducted with mayors and local crisis management teams, volunteer and professional fire brigades, civil protection and regional and district level crisis management offices, spatial planners and sectoral planners (like water authority officials). However, there is a necessity for further details, e.g. interview structure, issues raised by the participants in the meetings, conflicting views among experts, stakeholders and administrations etc."

Thank you for explaining the need for further details on the methodology (i.e. the interview) applied. We accept your suggestion and will add some more information about the interview structure, interview situations and issues raised by the interviewees.

b) "The title and abstract are clear and understandable and truly reflect the contents of the paper. However, there is an ambiguity about the types of risk and risk management that are pertinent to the findings or may benefit from the risk policy recommendations."

We agree that maybe it is beneficial for the understanding of the findings to more specifically explain which types of risk are pertinent to the findings. According to the comment made above we will further specify the validity of findings for different types of risk and refer to the need for further research related to natural risks other than hydro-meteorological ones.

c) "The authors give credit to previous and related work and they outline their own contribution. In certain sections of the paper however, the reader has the feeling that some arguments and statements are mentioned repeatedly (e.g. in page 3163 as regards the role of ISU)."

Thank you for spotting the repetition of arguments and statements within the course of the paper. We will make sure to avoid and delete repetitions when revising the paper.

d) "The references are exhaustive and match well with the issues raised in the pa-

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per. However, some recent socioeconomic and fiscal trends (like the economic and public debt crisis in the case of Italy for example) impacting on risk responsible public administrations have not been taken into account."

Thank you also for suggesting taking literature about recent socioeconomic and fiscal trends into account. While at several points we mention the problem of a general lack of funds and the consequences limited financial means cause, it is true, that we do not really take this information from specific literature about the economic and public debt crisis, but mainly from information gained in the interviews. We agree that it might be good to also consider subject specific literature to strengthen our arguments.

e) "In some cases suggestions and arguments are not very convincing because of missing factual or practical evidence. For instance in page 3165 (in the Conclusions) Romania is referred to as the only case of a two way communication process; however, this is not supported by reference to practical, successful experiences."

The intention was to highlight the practical, successful experiences – or not so successful experiences – in Section 3 and then refer to these examples in the conclusion section. We thank you for pointing out that these links are not particularly clear. We will therefore try to make those links clearer in the revised paper.

f) "The conclusions elevate the SDSS tool as the basic means of enhancing coordination between short- and long-term risk management strategies. Besides the fact that the tool has not been adequately described and presented it is obvious from the preceding analysis that the basic obstacle to coordination is not the lack of the tool. There are other important root causes (some of them already highlighted in the analysis) and only preoccupation with these causes might result into better coordination between spatial planning and short-term risk management policies."

We strongly agree with this comment and believe it is an important issue to be considered. As mentioned by the reviewer it is not the lack of the tool which is the basic obstacle to coordination. This is the reason why we will refrain from further and ade-

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quately describing the SDSS. We will therefore revise the conclusion section and put more emphasis on the other important root causes mentioned above, in order not to elevate the SDSS tool as the basic means of enhancing coordination. We thank Mrs. Sapountzaki for pointing towards the need to rather focus on important root causes and to underline the necessity for preoccupation with such issues in order to achieve a more effective coordination, rather than suggesting the SDSS tool as a main solution to the problem.

##### 5. Specific 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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