

Interactive comment on “The added value of system robustness analysis for flood risk management” by M. J. P. Mens and F. Klijn

Anonymous Referee #4

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The paper “The added value of system robustness analysis for flood risk management” focuses on an important topic, namely flood risk management under high uncertainty, and particularly on the added value of robustness analyses as an additional decision criterion. For instance also Kreibich et al. (2014, *natureCC* 4, 303-306) suggest, that in view of too high uncertainties in cost/benefit assessments additional criteria, such as robustness, flexibility or the precautionary principle can be considered in the evaluation of risk mitigation strategies. Therefore, this paper is very valuable since it concretely shows how one of these criteria can be quantified and used for a specific decision making situation in flood risk management for the IJssel River valley in the Netherlands. The approaches and methods described seem very suitable and are described in sufficient detail.

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However, since the main focus of the paper is on the added value of system robustness for decision making in flood risk management, this aspect needs much more attention. The respective chapter in the paper “5 Discussion of system robustness criteria” is short, descriptive and not very detailed. I suggest to add another chapter in which a “traditional” decision making criteria, e.g. cost-benefit analyses on basis of flood risk analyses is compared with the suggested new decision making criteria “robustness”. The following interesting questions may be answered: What decision would have been taken on basis of the one or the other approach? What are the differences and what are the consequences, if “robustness” is used as the only decision making criteria or if it is used complementarily to other criteria like effectiveness? Which uncertainty in risk analyses and cost-benefit analyses may be tolerable and under which circumstances one needs to rely on different decision making criteria? Etc.

Minor comments: Since the paper is presenting a case study, this should be made clear also in the title of the paper. Page 2917, line 11, I doubt that population growth is a significant issue for the Netherlands, I guess that increased vulnerability is mainly due to economic growth and land-use change. The structure of the paper does not follow the traditional structure of scientific papers, i.e. introduction, methods, results, discussion, conclusion. But the main body of the paper is split into the two approaches: “3 Flood Risk analyses” and “4 System robustness analyses”, which both are split into approach/methods and results. To guide the reader better through the paper I suggest to name the section 3.1 Approach for flood risk analyses and 3.2 Results of Flood risk analyses and 4.1 Approach for System robustness analyses and 4.2 Results of System robustness analyses

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