Interactive comment on "Measuring perspectives on future flood management on the Rhine: application and discussion of Q methodology" *by* G. T. Raadgever et al.

G. T. Raadgever et al.

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The authors of this paper would like to thank Referee #4 for the many constructive comments. Below we describe how we handled the referee's specific comments. We also submitted an author comment, in a new discussion thread, in which we explain the general changes that we will make to the aim and the structure of the manuscript.

1. See general authors' response.

2. As the Q set concerned a practical water management issue, it was not considered useful to set it up according to a strict theoretical framework (cf. Dryzek, 1993), but instead the Q set was develop in a more bottom way; as many aspects - covered in the concourse - as possible were included. In particular, statements on which opinions

were expected to diverge were included. The statements concerned four issues that are relevant in a scenario study: 1) the current or general situation, 2) autonomous developments, 3) management strategies, and 4) the desired future situation. We did, however, not determine in advance how many statements would concern each theme: we just tried to cover the aspects discussed in the interviews as comprehensively as possible.

3. We will explain the four criteria we used for deciding on the number of factors. First, each factor should explain more of the total variance than a single Q sort (the Eigenvalue should be larger than 1, Donner, 2001). Second, there should be at least four Q sorts determining each factor. Third, there should be at least four statements that significantly distinguish each factor from the others. Fourth, and most importantly, the analyst should understand the internal logic within each factor.

4. We will explain the thresholds for selecting a defining Q sort: "Individual Q sorts were selected as defining variables for a factor, when they had a statistically significant and clean loading on that factor. Factor loadings were considered statistically significant if they were higher than 0.38 (with p = 0.01) (For formula, see van Exel and de Graaf, 2005), and they were considered clean if they exceeded the loading on other factors with at least 0.1. "

5. We will try to make the paragraph clearer.

6. The time required to identify relevant groups of respondents, and to obtain the required support to contact them, varied strongly between different groups of respondents. Therefore, different groups were addressed at different moments in time.

7. We will make clear that the use of argumentation theory not standard in Q methodology, but that it helped to structure the interpretation of the factors.

8. We will change the sentences to: "The shared perspectives explained 43% of the total variance between all 47 individual Q sorts. The factors were defined by 36 indi-

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vidual Q sorts, which had a significant and clean loading on one of the factors. Of the eleven remaining Q sorts, three did not have a significant loading on any of the factors, and were therefore not so well reflected in the identified factors. The other eight Q sorts were reflected in the identified factors, but did not have a clean loading; they were not used as defining variables, in order to maintain a clear distinction between the factors. "

9. See general authors' response.

10. The repeated word will be removed.

11. The conclusions about non-significant statements will be deleted.

12. We explain that the aim of Q methodology is to find patterns within and across individuals earlier, in the methodology section of the manuscript. We do not feel the need to state that again in the results section. Although it is not the main aim of Q methodology, we think that presenting characteristics of the groups of respondents that define a factor is also relevant.

13. We will delete the sentence and explain in the appendix that a major advantage of Q methodology is that it takes only a small sample of respondents to produce statically reliable results (Brown, 1980).

14. We will explain better what a clean factor loading means (in the methodology section): "Individual Q sorts were selected as defining variables for a factor, when they had a statistically significant and clean loading on that factor. Factor loadings were considered statistically significant if they were higher than 0.38 (with p = 0.01) (For formula, see van Exel and de Graaf, 2005), and they were considered clean if they exceeded the loading on other factors with at least 0.1. "

15. We will delete the trivial remark about the loss of richness when aggregating individual perspectives. See further general authors' response.

16. A fixed distribution is indeed no obligation, but the fixed distribution forces the

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respondent to compare their agreement with each statement, in relation to the other statements, over and over again. This decreases the risk of arbitrary or biased sorting, for example under influence of the respondent's mood at the time of sorting, and to increase the repeatability of the sort. However, from the application it occurred that some respondents were dissatisfied about the time and effort required to iteratively put a fixed number of statements in each score category, and about the fact that their perspective could not be expressed using such a fixed distribution (cf. Rugg and McGeorge, 1997, who see this as a major disadvantage of Q sorting). This could be solved by allowing respondents to distribute statements over categories as they want, without prescribing the shape of the distribution (e.g. Steelman and Maguire, 1999). When the respondents are not at all stimulated to evaluate their agreement with one statement relatively to their agreement with another, however, accuracy of the elicited perspectives will be low.

17. As part of the PhD research of the first author, it is planned to ask all stakeholders who participated in at least one of the scenario workshops in the case study, and who filled in the Q sorting questionnaire before one of the workshops, to fill in the same Q sorting questionnaire again after the third workshop. This way, it is intended to measure changes in individual perspectives, as an indicator for the cognitive learning that occurred at the workshops. This concerns not only learning from feeding back the perspectives, but also from discussing scenarios and strategies, input of expert knowledge, etc. By carefully observing the collaborative process at the workshops, we will be able to link the learning to the collaboration. Besides cognitive learning, it is intended to measure convergence between perspectives. A similar study has been executed before by Pelletier et al. (1999).

18. I that assume in the final version all figures and tables will be at right place in the main text. For now, we had to put them at the end.

19. We will redesign table 3 to make it clearer.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 5, 437, 2008.