

# ***Interactive comment on “A Q methodological approach to identify practitioners’ viewpoints on citizen science in Dutch regional water resource management” by E. Minkman et al.***

**Anonymous Referee #2**

Received and published: 26 April 2016

## **1 General comments**

This manuscript analyses perspectives of practitioners related to the Dutch Water Authorities on the concept of citizen science. Citizen science as a topic is receiving increased scientific attention both from a natural and social sciences perspective. Where the former are mostly interested in the opportunities for data collection and analysis, the latter analyse aspects of motivation, dynamics of interaction, influence on decision making, empowerment, credibility, among others. Science communication and education are two very promising aspects of the potential of citizen science, and it is therefore opportune to analyse them in the context of this special issue.

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But I identify 2 main weaknesses in the current manuscript. The first has to do with the focus, which balances uncomfortably between a methodological and a process oriented paper. More fundamentally, the manuscript takes a quite narrow view of citizen science, and by doing so in my opinion fails to present an in-depth and informative analysis. I elaborate on both aspects below:

1. The way that the manuscript is written, it seems to try to combine methodological novelty with generating insights in citizen science perspectives of professional practitioners: on the one hand it wants to prove that the Q methodology is useful to address this kind of problems, and at the same time wants to present insights in the perspectives of practitioners on the use of citizen science. Such combination is often not ideal. A methods paper focuses on improving a method, ideally by comparing it the outcomes of an established method as a benchmark. On the other hand, an insights oriented paper uses an established method to generate new insights on a certain process. To me, this manuscript would seem to fall in the second category: although I am not thoroughly familiar with the Q methodology, it seems a well-documented method that, while perhaps not very common in hydrology, is appropriate for this kind of problem and has been applied without much if any scientific novelty. In this case, the focus on the methodology can be reduced to a short argumentation of why the method is relevant and how it is implemented. That would allow for a clearer focus on the outcomes of the analysis, which I think is currently quite superficial and can be contextualised better (see point 2).

2. The manuscript is rather light, both on the contextualization of citizen science in the introduction, and the subsequent analysis and discussion of the results. The study seems to treat citizen scientists mostly as "assistants" to help solving a question (or generate relevant information) determined by the practitioner's reality. This is indeed a common form of citizen science but is arguably more relevant to citizen - scientist collaboration where there is a clear scientific objective (e.g., the seti@home project). In a policy context, as seems to be the case here, different forms of citizen science may

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emerge that are not necessarily aligned to the agenda of the practitioner. Indeed, in the context of water quality the agenda of the citizen science may have a political nature that is not always aligned with government or may even be used to contest government practices or highlight deficiencies in governance (see e.g. Macknick and Enders, 2012, and the overview in Buytaert et al., 2014, table 1). It seems that the examples of citizen science projects used in this study are relatively “safe” from a political perspective (p4/4-6), but I can imagine that the perspectives of practitioners might be quite different if a more conflictive example of citizen science were to be included. The potential for such contestations to arise in this particular context is difficult to gauge without more background - indeed “conflictive” citizen science initiatives are more likely to emerge in regions with severe environmental issues and/or governance deficiencies, which is probably not the case here. But I hope that my point highlights the importance of the policy context, and related aspects/issues of buy-in, trustworthiness, and credibility in a citizen science - policy interface. Indicative of this need are also some conclusions drawn at the end but not elaborated much further. For instance, p6/1-2: “no support was found for collaborative or co-created projects”: I wonder whether this is truly because of a lack of potential, or simply because of a lack of familiarity with collaborative citizen-science projects. Similarly, p17/3-4: “according to the participants, citizen science has the potential to transform governance structure”. It is a pity that this is not elaborated further, because (as I have tried to argue above), aspects like these really touch upon some of the scientifically more challenging aspects of citizen science and its potential relation to policy.

Given the relevance of these aspects to the role of science communication, education, and more generally the science - policy - public interface, I would strongly encourage the authors to develop the manuscript along these lines, which I believe would increase significantly its relevance and impact.

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## 2 Specific comments

1/8: “effective science communication”: Citizen science is of course much more - see general comments.

1/19: “higher levels”: might be explained further in the manuscript, but not very informative here. Can you be more specific?

2/17: an example of what?

2/21: “effective for a certain target audience and for certain levels of interaction”: rather vague

2/22 - 25: quite anecdotal and short - can you elaborate more?

2/32: “Citizens engage in citizen science because they think it is fun”: this is only one of many different reasons to participate in citizen science (see general comments)

3/27: aims to capture a general image of citizen science: Not sure what this refers to, especially because the reported study is also case study based.

3/30: “supported by viewpoint”: Not clear. What viewpoint?

3/31: “design implications”: this is not really elaborated much in the discussion/conclusions.

4/8: “relatively uncommon method”: I suspect that the reason why it is uncommon is mainly because it is not applicable to typical problems in those scientific fields. Although I am not thoroughly familiar with the method, it would seem to a typical method for the type of question addressed in this study. If so, the description of the method can be short (relying instead on references); instead it is sufficient to explain how the method was implemented in this particular case (in order to ensure reproducibility). See also comments above.

5/13: “tested”: how? More specifically, how were the 65 statements reduced based on

this test?

5/20: “Next, ...”: How were the initial participants selected within the institutions?

5/20: “within or outside the urban conglomerate Randstad”: I am not sure whether I understand this. Did you try to strike a balance between the number of institutions within and outside Randstad? If so, why?

5/22: “Two to six”: why this diverging number?

5/26: “arranging from”: what does this mean? Do you maybe mean “The actual ranking process”?

6/22: “preferred” -> preferable?

6/23: “too much time”: so how was the interview ‘reduced’?

8/5: “if yes”: I am perhaps being a bit pedantic, but would it not be more informative to know if participants would not recognise themselves in the narrative?

8/10: What is considered to be “convincingly”? Is this an eigenvalue  $> 1$ ?

8/14: “overlap”: overlap between what?

9/5: table 3: Shouldn't the Y axis label read “number of interview fragments” instead of “number of interviews”?

12/11: subheader 3.1.1 is redundant because there is no 3.1.2. Remove it and perhaps change the title of 3.1 to that of 3.1.1. (the same for 3.2.1 and 3.3.1).

16/15: the conclusions should come after the discussion

17/12: “voluntariness” -> the voluntary nature

19/20: If this publication is forthcoming, surely the publication year cannot be 2014?

### 3 references

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., doi:10.5194/hess-2016-26, 2016.

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