

## ***Interactive comment on “The seven rules for hydrologists and other researchers wanting to contribute to the water management practice” by E. Mostert and G. T. Raadgever***

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Dear reviewers,

First of all, thank you for your comments, which will be useful for improving our manuscript. The first step we took was to summarize and group the comments. Below you will find all general and more specific comments, including an indication of who made the comments, as well as our reaction to the comments. We considered this to be a more useful approach than responding to the authors' comments individually as this gives a better idea of how the paper was received and how we plan to improve it. We plan to resubmit the paper within a few weeks.

Sincerely yours, Erik Mostert

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## GENERAL

1. The title is too long and clumsy (rev. 1) The seven points that are discussed do not really constitute "rules" but rather "important points for consideration". (rev. 1 and 5)
2. What is specific about the rules for hydrology, as suggested in the title? (rev. 4 and 5) The rules might be more relevant for water management than for hydrology. (rev. 4)
3. The presentation in terms of steps does not reflect the practice. "Things do not happen in such steps, and the paper does not convince us that they should." (rev. 1, see also rev. 5)
4. The "rules" are food for thought and cannot be tested, as suggested in section 9. (rev. 1)
5. It would have been more interesting to test the rules against one or two case studies. (rev. 4)
6. The unconventional style (for a research paper) makes it more difficult to review the paper. (rev. 4)

The first issue, raised by two reviewers, is whether the seven "rules" really constitute rules. This hinges upon the meaning of "rule". Two relevant meanings of "rule" in this respect are 1) prescription (e.g. the "rules of lawn tennis"), and 2) regularity ("as a rule"). When Bourdieu speaks about science as a social field following its own rules, he uses "rule" in the second sense. In the policy process rules are followed as well, but different rules. An interesting question is then what rules, if any, are followed at the interface of science and policy. Our main concern, however, is not merely to describe, but to prescribe what rules researchers should follow if they want to contribute to the policy process. We therefore use "rule" in the first sense. Our rules constitute important points for consideration, but we go one step further: we think they should be considered. We will state this explicitly.

"Rule" may also refer to a specific procedure or "cooking book recipe" that tells you

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exactly what to do to achieve specific results (as in "mathematical rule"). As the introduction states, our paper does not provide a recipe for success, but rather aims to promote reflection. People looking for a cooking book recipe may misinterpret our use of the term "rule", but we would be very happy if they read our paper too.

That being said, the title was indeed rather long and clumsy. We are presently thinking of changing it into "Seven rules for researchers to increase their impact on the policy process", but we need to give it a bit more thought. In any case, we can skip "hydrologists" in the title. Most of the argument applies to scientists and other experts in general. The main reason for submitting the manuscript to HESS is that we wanted to tease out the implications of the growing literature in the field of science and technology studies and research use and address the hydrology and water management experts themselves, and not just the scholars active in these fields. For this we consider HESS to be appropriate, and we feel that our seven "rules" are relevant for its readership. The example that we give come from the field of hydrology or water management (Box 1: water footprint, Box 2: flood risks).

According to reviewer 4, the rules might be more relevant for water management research than for hydrology. In our eyes, a major difference between hydrological and water management research is that the latter is often more applied than the former, but it is impossible to separate the two strictly: much hydrological research has a direct link with water management. Section 4 discusses fundamental research explicitly and argues that the at least some of the rules are relevant for fundamental research as well.

The "presentation in steps" is not how we intended this. Things indeed do not happen in such steps, nor do they have to happen in such steps. We will correct our presentation.

There is some disagreement among the reviewers whether the seven rules can be tested or not, but this may result from ambiguity of the verb "to test". We claim that following the seven rules increases the contribution of science and technology to policy, and we would welcome case studies that address whether in a specific case the seven

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rules were followed and what in fact the contribution to policy has been. Such case studies could, in theory, start tomorrow. Testing the rules in a strict sense, however, would require more preparatory work. It would require, among others, the formulation of specific hypotheses and the development of indicators for the extent to which the rules were followed and the contribution to policy. We will clarify and correct the relevant parts of our paper.

We agree with reviewer 4 that it would have been interesting to "test" the rules against one or two case studies. However, we first had to present the rules, which is difficult enough. The second author is currently conducting PhD research in which he studies the interaction between experts and other stakeholders in two cases, one on flood risk management and one on groundwater modeling and management. Many of the issues raised in this paper are addressed in this research, but it is still ongoing research.

The style of our paper is admittedly a bit unconventional. The methodology used is that used for a literature study. In practice, we first came up with the idea of seven rules (a creative jump following no methodology), using the literature that we had read before and our personal experience with research projects that aimed to be policy relevant. Next, we did an additional literature study. The only basis for reviewing the resulting paper that we see is the quality of the argumentation, including the referencing.

## SECTION 1: INTRODUCTION

7. P. 844: Equated politics with policy, which is not entirely correct: institutions can have their own policies without a direct link to politics (rev. 5)

8. "Rewards are political power and influence": more practically "votes"! (rev. 1)

As we see it, politics is an aspect of the policy process: it is broader than the activities of professional politicians. "Votes" are indeed the direct rewards in the policy process, at least at the political top of the hierarchy. We will carefully review the section.

## SECTION 2: REFLECT ON THE NATURE AND POSSIBLE ROLES OF RESEARCH

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9. The "rules" entail a certain danger to undermine the role of science as neutral party in a policy process, not supporting any vested interests. (rev. 3)

10. Moreover, trust in science not only depends on being right or wrong, but also in science being impartial and reflexive about uncertainties. (rev. 3)

11. Research is value laden but not always "subjective, driven by personal interests". If so, why pay more attention to science than to any other interest group? (rev. 3)

12. Science aims at least for shared practices that support to develop insights that go beyond situated, place-based knowledge shaped by individual interests and preferences, despite being constrained by the boundaries of scientific practice and disciplines. Here a more careful reflection would be useful. (rev. 3)

13. The discussion in section 2 on who is and who is not an expert does not matter that much as long as in the end of the day there is contribution towards new knowledge. (rev. 5)

14. Different types of research should be distinguished i.e. research driven by e.g. donors, society, stakeholders or even realisation of existence of knowledge gaps which, as a result of research outcomes, culminate in improved situations including policy shifts. (rev. 5)

15. Section 2 would benefit from an earlier mention of Jasanoff and the debate on local or traditional knowledge. (rev. 1)

16. Relevant disciplines: Relevant to what?

Reviewer 5 and especially reviewer 3 are not completely convinced by the argument in section 2 (which provides the basis for later sections). The key issue is the nature and possible roles of research. Can science be neutral and impartial and can personal interests be ruled out completely? Or is it all about power (cf. Foucault) and is the opinion of any interest group as good as an expert opinion? We think there is a third option and we will try to present this option more clearly. In addition to the references

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to Knorr Cetina (1995) and Jasanoff (1990), we will add the metaphor of maps and map making. Maps are highly selective and imply a purpose, e.g. helping car traffic (road maps) or supporting public transport (e.g. metro maps). Many different maps are possible, but this does not mean that each map is as good as another. Road maps, for instance, may not include new roads and still show roads that have been closed down, and contain many other types of mistakes. The same is true of research. Many different types of research are possible. For each type the traditional scientific standards of validity and reproducibility still apply, but what is researched and how reflect different values. (We will work a bit more on the exact wording since this refers to a crucial point in our paper.)

It is true that research is not always "driven by personal interests" if by "personal interest" the reviewer means financial gain and personal prestige. Yet, research is influenced by personal views and values. We will check whether our point is made clear enough.

We consider the discussion who is and who is not an expert to be important. It may be true that, in the end of the day, what matters is whether there is contribution towards new knowledge, but who decides whether something counts as a contribution towards new knowledge? In many cases the peers - or in other words: experts - decide. Sometimes other stakeholders are involved as well, but in both cases the value attached to a contribution depends largely on the status of originator as expert or not. We may approach science as a "shared practice", but a key question then becomes who is included and who is not included in this practice. To conclude, we cannot avoid the question who counts and who does not count as an expert and on what grounds.

In the paper we distinguish between more applied and more fundamental research and between different disciplines, and we mention the importance of (different) clients. We mention "government" and stakeholders explicitly. Perhaps we can find a place to mention "donors" explicitly as well. "Society" as a client is a bit abstract, especially if there are different values and interest going around, as there usually are. The "realization

of existence of knowledge gaps (that) culminate in improved situations including policy shifts" is one example of conceptual research use discussed in section 5.

We will try to add more references concerning traditional/ "lay" expertise. As to the question "relevant for what": relevant for the issues at stake. This will be clarified.

### SECTION 3: ANALYSE THE STAKEHOLDERS AND ISSUES AT STAKE

17. Section 3 is unnecessarily long on how to do a stakeholder analysis. (rev. 4)

18. The political dimension of stakeholder identification is lacking: exploring interdependencies is not in situations with lopsided power relations. (rev. 1)

19. It should be acknowledged that it is more common to identify stakeholders for a specific issue than the opposite. (rev. 5)

We will shorten the "how to do a stakeholder analysis". Moreover, we will look into the political dimension of stakeholder analysis because there certainly is one. We do not think, however, that lop-sided power relations preclude interdependencies completely. Finally, it is true that most stakeholder analyses start with a specific issue and then identify the stakeholders for that issue, but it is also true that the issue is never a given: it has been identified by one or a few stakeholders (e.g. government departments). Moreover, if the (group of) stakeholder(s) that initially identified the issue to be addressed really depend on other stakeholders, they should be open to their concerns and redefine or broaden the issue (cf. collaboration theory, e.g. Gray 1989).

### SECTION 4: CHOOSE WHOM AND WHAT TO SERVE

20. The rule "Choose whom and what to serve" (section 4) is not clear. It is not a rule, but merely a recognition of subjectivity; it is not a rational choice: options have already been determined "upstream", e.g. in the researcher's choice of career. (rev. 1)

We will clarify this point. What we wanted to state is that researchers should reflect on the choices they make and make them consciously. We do not want to suggest that

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these choices can be made completely rationally and we recognize that the choices open to a researcher depends on for instance his choice of career, but we like to emphasize his or her own responsibility.

## SECTION 5: DECIDE ON YOUR STRATEGY

21. Advocacy research should not be supported as a research strategy: it will undermine the credibility of science. (rev. 3)

22. The discussion on strategic research use in section 5 is misplaced: "what is described is not a type of research but a way of using certain research output to further particular agenda's." (rev. 1)

We would like the reader to draw his or her own conclusions as to acceptable research strategies. In our view, advocacy research cannot be equated with bad research, although much of it may be bad (see our reaction concerning section 2). It could threaten the social standing of science especially if people expect science to be neutral and impartial. This may differ from country to country. (It would be interesting to describe and compare the public's reaction to the discussion between climate change researchers and climate change sceptics in different countries.)

Strategic research use is often aimed for and that is why we discuss it in the section on research strategy. We will change the word "users" on p. 851, line 21, into "clients", this hopefully clarifies matters.

## SECTION 6: DESIGN THE PROCESS TO IMPLEMENT YOUR STRATEGY

23. Section 6: "Realistically" should be "ideally"

We will reformulate the sentence to make our point clearer. We are not talking about the ideal situation, but about the maximum that we think can realistically be achieved in practice.

## SECTION 7: COMMUNICATE!

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24. Section 7, "Communicate" is also about legitimacy: refer to Latour and Cash. (rev. 1)

This is correct. We have chosen to use the heading "communicate!" to emphasize what researchers can do. "Legitimacy!" would not be a very good rule, and legitimacy may be misunderstood as something that researchers have a right to, and not as something that results from the interactions between the researchers and their public (cf. Wynne 1992, 1996). See our discussion of trust, which is closely related to legitimacy.

## SECTION 8: CONSIDER TOUR POSSIBILITIES AND LIMITATIONS

25. Rephrase last line of p. 856 (rev. 1)

We will look into this.

## SECTION 9: DISCUSSION

No additional comments.

## REFERENCING

26. References should be cited in consistent chronological order (rev. 5)

This will be done.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 5, 843, 2008.

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