

Interactive comment on “Participatory scenario development for integrated assessment of nutrient flows in a Catalan river catchment” by F. Caille et al.

F. Caille et al.

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Response to Reviewer’s comments

Thank you for your thoughtful and relevant comments. These comments are in the revised manuscript. Below we respond to the major points that you raised in your review.

The participatory process

We comment on your specific remarks on (a) the scenario typology, (b) how the participatory process was introduced to participants, (c) the research exercise and its objec-

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tives and negotiation, and (d) a clarification concerning the participants and institutions.

Can the scenarios be classified as “normative”? Scenario development was based on important and uncertain driving forces, but the entire process ensured that neither predictable nor impossible scenarios were considered. The objective was not to build preferable futures, nor to reach a specific goal, but the process produced a sustainability scenario which, out of all four scenarios, is obviously the preferable future. But the scenarios share some qualities of normative scenarios as defined by van Notten et al., namely a consideration on the interpretations, values and interests of scenario developers.

The participatory process was introduced to the participants mainly as an exercise for research purposes and therefore more neutral (but see our comments below on the role of researchers). Although we focused on a potentially conflicting environmental issue (i.e., nutrient emissions and river ecological state), the exercise was not geared towards short-term action and conflict resolution. Rather, we wanted to motivate participants to think more openly and creatively about possible futures for their catchment. Accordingly, we set a time horizon for the exercise (2030) that was far enough into the future to avoid forecasting current trends. Eventually, however, the results from the scenario development workshop and the modelling exercise will be made available to stakeholders and regulating agencies in the hope that they will provide useful material for the development of a catchment management plan as required by the Water Framework Directive.

Most of the participants had not been involved in any participatory exercise before this workshop; consequently, both the goals of our project and the steps and objectives of the participatory process were presented and discussed with the stakeholders before each activity. The workshop objectives were not negotiated because they were linked to a larger project and a modelling exercise. Although we agree with the referee that it can be advantageous for a participatory process to start with an open discussion of the conflicting environmental issues and the definition of an action and research agenda

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that simply was not our goal. Besides, discussion of the objectives could not have been accommodated in a one-day session.

Has the "Shaping actors - shaping factors" method been employed in the scenario building process? This method, used for the first time for "The European Challenges post-1992" (A. Jacquemin and D. Wright, 1994), was also employed to analyse the future of the system. A first and previous evaluation of the socio-economic system relevant to nutrient emissions to the river and the identification of the actors which may affect the driving-forces and influence the future of the system was summarised in an analytical framework indicating the role, pressures and impacts of all social actors (See p. 1272 and 1273). In this manuscript, we just introduce it to let readers know that we explored and analysed the complex human-ecosystem interactions. (Perhaps another author has a ready response to this?). Regarding the selection of the participants, the potentially conflicting environmental issue which we were focused on had an impact on the recruitment, especially for the industrial sector. Indeed, the main difficulty lied with participants that might have a direct effect on water quality (nutrient emitters). We have modified the text explaining that the process required paying special attention to the selection of the participants and also to the way to present the participatory process and its context. As we explained in the manuscript on p. 1273, we sought participants who expressed an interest in being involved in the exercise. Also interactions and arguments were part of the process, and enhanced the creativity and development of the scenarios. Even if we paid attention to keep the workshop on track, we also tried to be attentive to their arguments as we explained in the text; the stakeholders were the main actors giving the information allowing us to design the future of the catchment. In our role as workshop facilitators, we tried to be as neutral as possible, trying to support interaction and communication between participants.

It is in this context that our comment about the participants "slowing down the process", which you felt as derogatory, must be understood. It did not appear to us that participants were trying to divert the focus from our main objective. Rather, they tended to

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fall back on their own sectoral problems or current interests, and on forecasting current trends. Thus, as facilitators we tried to redress the discussion and stimulate a more imaginative thinking about the future. This is introduced, explained and summarised in the discussion of the manuscript.

The referee points to a mismatch between the number of stakeholders and the number of participants which is explained by the fact that some participants were representing more than one stakeholder. We have modified the table to make this clearer.

The role of researchers

You felt that the objectives of the process were not clear enough and that a written reflection upon the role of the researchers in the participatory process was lacking. We have modified the manuscript to clarify these two points.

On a practical level, the objective of the workshop was to produce, through a participatory process, local socio-economic scenarios that were relevant for modelling the evolution of nutrient emissions into the river in the mid-term (i.e., about 30 years ahead). The motivation for the researchers was to guarantee that the scenarios used in modelling nutrient fluxes into the future did not simply reflect the researcher's biases but were underpinned and supported by the opinions and sentiment of a diversity of stakeholders. In the context of water management, the scenario building was an efficient way to acquire information from expert judgements that might make decision-making more robust and that help identifying strategies for pre-empting undesirable future developments. In addition, we wanted modelling scenarios to be grounded on socio-economic scenarios, thus making manifest the connections between nutrient fluxes in the river (and, more broadly, water quality and ecological status) and both local and regional socio-economic trends or changes and management actions. Thus, the effort of combined methods of data collection might encourage catchment managers and planners to consider the scenarios and their impact on nutrient emissions for helping them define catchment management strategies.

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Yet besides this practical goal there is another goal implicit in our conception of the participatory scenario development workshop as a learning process for both researchers and participants. We have already emphasized in the paper that participatory processes were, in most cases, new to workshop participants. One may argue that, more generally, participatory mechanisms of environmental management and governance are rare in Spain and many other Mediterranean countries, at the same time that they are called for not only by current legislation such as the Water Framework Directive but also by grassroot movements such as the New Culture of Water, as we acknowledge in the revised manuscript. Thus we see the workshop as a pilot exercise that both stakeholders and management agencies, both represented at the workshop, might benefit from.

The referees also raised the question of whether a participatory workshop was needed to reach a set of scenarios that seem common sense and presumably could have been produced by the researcher themselves. Perhaps the real question is whether a different group of participants or a close, common sense approach, would have yielded the same set of scenarios. We suspect not; at the very least, these researchers feel that they would not have come up with the same set scenarios. Are therefore these scenarios “better” than what a closed session would have produced? Who is to judge? What is clear is that by not doing the participatory process, we all (stakeholders and researchers) would have missed a precious opportunity to learn and be involved in (or communicate) a research exercise, modest as it may be.

Was the process influenced by preconceptions and biases willingly or unconsciously imparted by the researchers/facilitators? We have insisted in the paper that we tried to be as neutral as possible, yet it is obvious that a participatory exercise initiated by the stakeholders themselves and facilitated by an external and professional moderator would have been very different –starting with the objectives. Even if we tried to be neutral, the simple fact that the researchers came from ecology and environmental sciences university departments undoubtedly carried some weight. Yet the value of

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the formal process of scenario development presented in the paper lies precisely in its ability to facilitate an open discussion and the free and active involvement of all participants.

How challenges of the participatory process could be solved? Disagreements or conflicts were not as strong as if the scenario building was based on a short-term horizon. The 2030 horizon was favourable to think serenely about the future of the catchment, and hopefully, stakeholders have their feet on the ground and did not to give unrealistic arguments, but all of this did not avoid disagreements between them, which enhanced the group's creativity. In that case, the researchers tried to enhance discussion and refocus people on the topic, and asked them to add precision as we explained in the text (p.1284 and 1287).

From the scenarios to the catchment model

You argue that “translation of the results into the model and the eventual success of the joint participation-modelling-assessment exercise remain undocumented and unclear”:

One of the objectives of the process presented here for the development of scenarios was to prepare a basis for the elaboration of quantitative nutrient emissions scenarios in the context of a research project that involves modelling yearly nutrient emissions over the last decade and scenarios into the future. The purpose of this paper was to discuss the process of scenario development, not the modelling exercise, which will be presented in a separate paper. We just introduce the catchment model to let readers know that the model is related to the qualitative scenarios, and we are using it to estimate N and P emissions for the past and present. Thus we only discuss the translation of storylines into meaningful semi-quantitative nutrient emission scenarios. We are well aware that this is only a first evaluation; defining quantitative and, perhaps more importantly, spatially-explicit (by subcatchment) changes in model inputs will require further consultation with participants via e-mail or personal interviews.

As we recognize in the paper, participatory integrated assessment only realises its

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full potential when participants benefit from their involvement. Thus we envisage the modelling exercise as part of the participatory process.

Moreover, regarding the model indicators, on p.1275, we explained that the indicators come from the model Moneris, but they are common factors, i.e., they could come from and be used by any other model. We quote Moneris, because this is the model considered and used for our project.

We have tried to make this all clearer in the revised manuscript.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 4, 1265, 2007.

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