No	Comments and Answers
1	In the manuscript, the authors provide a description of the H2Ours serious game developed and tested on two locations in Indonesia with an opinion on the possibility of adapting this game to other areas and conditions. While the reasons for developing such a game is clearly described and explained, the rules of the game and the flow of the game are not so clear for the reader. I found especially hard to follow so many subtitles in sections 2 and 3 (Methods and Results) that interrupt the reading flow and consequently the understanding of the game. Moreover, it is not clearly stated who should be the target group of players (students, farmers, general public etc.). Answer, Thank you for your comments. We have added more information according to your comments. We hope our response addresses your concerns and makes this manuscript clearer. We provided more detailed explanations of roles (section 3.2.2) and rules (section 3.2.3). Please see We added more information about the participants in the Section 2.4 (Game implementation) "In this study, we executed ten game sessions with different participant groups with a total of 93 participants. The ten game sessions consisted of five sessions at each study areas. The five game sessions consisted of a session with a multi-stakeholder forum consisting of representative of governments, NGOs, private sectors, and universities to get ideas on regulations and programs that would be offered to local communities/farmers, and four session with farmer groups to implement the regulations and programs resulting from the game simulation with the multi-stakeholder forum. In each session with farmer groups in Rejoso watershed, we invited a total 9-12 representatives of farmer groups from upstream, midstream and downstream village to a meeting hall where all participants could still reach it. While in each simulation in Pawan-Kepulu peatland, we invited 12-16 representatives of farmer group from four villages in that landscape. In the invitation, we let the group determine who would attend the simulation, provided that the group representatives were willing to hold discussions and exchange information with participants from other villages. During the game simulation, we asked the invited farmers to behave as farmers in line with the position of their village in the landscape. For the four sessions with farmer groups we selected participants according to different criteria. For Rejoso watershed, we conducted two sessions with participants who had experience with a recent Payment for Ecosystem Services (PES) program (Leimona et al., 2018) and two sessions with participants from neighboring villages where the PES program was not active. Meanwhile, at PHU Pawan-Kepulu we conducted a game session with members of the village forest management unit, a session with members of an active farmer field school, and two sessions with people who are not members of village forest management unit and farmer field school. "
2	For me as the hydrologist, the content of section 2.3 about game solution space analysis is not described clearly enough, more specifically, how did you produce random choices (e.g., using some software, etc.).

	Answer: Thank you for your input. We added more information about the process of producing solution space in section 2.3.4 "Solution space is defined as a set of all possible decisions made by players. The solution space of the game was explored based on the average of economic and environmental conditions obtained from 3, 10, 30, 100, 300 and 1000 games with random-choice. One random-choice game consisted of 10 rounds in which climate conditions and land use decisions made by players are completely random. The random-choice of land use and climate condition were generated in R, then simulated using Excel spreadsheet as an imitation of the real H2Ours game to calculate the economic and environmental conditions. In addition, we assessed the probability of outcomes within the solution space under random decision-making as a point of reference for the actual game implementation."
3	Also related to the rules and flow of the game, it is not clearly described how and when the models shown in Figure 6 and Figure C3 take place in the game. Please clarify. Answer Thank you for your concern. We revised text in the section 3.2.5 (Game Properties) to add more explanation about Figure 6: "To make the game more interesting and stimulate engagement, we prepared some game materials such as a game board to represent the landscape, land-use tiles according to the existing and future land cover types, play money token, and water infrastructures token (Fig. 5). We also created water balance miniatures (Fig. 6) to demonstrate how surface water flows and becomes flood and water infiltration become ground water supply. Each round after calculating the economic condition and environmental conditions based on Table 3, we asked players to pay production costs, taxes, etc. and get income, incentives, etc. using play money and fill the water balance miniature with real water according to the produced surface water and groundwater. "
4	In line 119 it is not clear what kind of values represent discharges 5 and 3,5 m^3/s (average in the mentioned year, some long-term average, something else?). Please clarify. Answer: Thank you for question. The value represent the average throughout a year of the daily discharge. We changed the text to: "Land conversion from agroforestry to intensive agriculture in the recharge areas (> 700 masl. upstream and midstream area) and massive groundwater extraction using artesian wells in the downstream area for rice field were thought to cause the reduced average (during a hydrological year) of daily discharge of the Umbulan spring, from 5 m^3/s (1980s) to 3.5 m^3/s (2017) "
5	Table 1 in my opinion is too long/big and similarly as multiple subsections break the reading flow. I would suggest adding some summary into the text and moving the table into appendices. Answer: Thank you for your suggestion. We moved table of criteria of credibility, salience and legitimacy to Appendix C, and replaced that table with short summary in the sub-section 2.5 p. 3)

	"From the long list of criteria (Belcher et al., 2016), we chose four credibility criteria, five salience criteria and two legitimacy criteria which we considered to be the most relevant for evaluating the H2Ours game to meet the objective of the game. Each of these criteria were included during the game design process and the evaluation after game implementation. We included those criteria during the game design using ARDI and DPSIR frameworks to structure socio-hydrological data and information based on the research findings from ICRAF and Tropenbos Indonesia (both already and to be published) to meet the criteria during the game development process. For evaluation after game implementation, we converted those criteria into several question ans statements for the q-method and Likert survey and asked all game participants to fill in the survey."
6	In line 231, a brief explanation about both methods, i.e. Likert scale and q-method, needs to be added. Answer: Thank you for your input. We added further explanations related to Likert scale and q-method. We elaborate the text in section 2.5 (p.3) "In the Likert scale survey, we used five-point scales (strongly disagree, disagree, neutral, agree, and strongly agree) on six statements to ask about their feeling during the game, their understanding of the rules of the game, the length of the game simulation, new knowledge that they got from the game, and how close the game to their reality. We used q-method to capture participants' subjectivity regarding the relationship between vegetation, water and humans, the causes of socio-hydrological problems in their region and the factors that determine the success of hydrological condition restoration activities. To capture changes in their perceptions regarding these three questions, participants conducted the q-method before and after the game using the same questions and q sort statements. The results of the q-method will be presented in another paper along with their decision making, preferences, vision, collaborative and collective action. "
7	In Figure 4, Figure D1, Figure D2, and Figure D3 it is not clear what are presenting solid blue, green, and red lines. Additionally, "ml" in legends should be replaced with "masl". In relation to these figures, why are there different thresholds used (e.g., 200, 800) than explained in lines 114–116? Answer: Thank you for your suggestion. The legend is correct with 'ml' because it describes the amount of surface water and ground water (>200 ml). We will make the legend clearer. We added more explanation about the threshold value (e.g. 200, 800) in the section 3.2.3 because this is related to flooding, water shortages and land fires as a result of the impacts from Table 3 and Table D2. "When the total of surface water in the downstream of Rejoso watershed and in the shallow peat of Pawan-Kepulu peatland exceeding its capacity (>800 ml) during the rainy season, it caused flooding. When the groundwater exceeding its capacity (>700 ml), it flowed to springs in Rejoso watershed and to sea in Pawan-Kepulu peatland. But, when the groundwater was less than its requirement (<200 ml), it caused water shortages in the Rejoso Watershed and potential fires in Pawan-Kepulu peatland. These environmental impacts decreased the community income. As the consequence of this situation, they might not have enough money to manage their land,

	buy food or pay taxes in the next round of the game. The multi-stakeholder forums with their limited budget could then choose to help them by providing financial help or making regulations/programs to prevent these environmental problems. Through this gameplay, we expected to promote all actors to work together and collaborate to achieve their goals.”
8	In Figure 7, there are missing y-axis titles. Please add. Answer: Thank you for your correction. we revised the Figure 7
9	Please use en-dash throughout the manuscript in case of ranges and periods. E.g., 0–100 masl instead 0 – 100 masl. Answer: Yes, Thank you. we checked all the manuscript and revised it
10	Appendices should be mentioned in text in the order in which they appear, e.g., Appendix A before Appendix B. Answer: Thank you for your input. We have change the order of the Appendices

Reference:

Belcher, B. M., Rasmussen, K. E., Kemshaw, M. R., and Zornes, D. A.: Defining and assessing research quality in a transdisciplinary context, Res. Eval., 25, 1–17, https://doi.org/10.1093/reseval/rvv025, 2016.

Cash, D., Clark, W. C., Alcock, F., Dickson, N., Eckley, N., and J�ger, J.: Salience, Credibility, Legitimacy and Boundaries: Linking Research, Assessment and Decision Making, SSRN Electron. J., https://doi.org/10.2139/ssrn.372280, 2002.

Jeanes, K., van Noordwijk, M., Joshi, L., Widayati, A., Farida, and Leimona, B.: Rapid Hydrological Appraisal in the Context of Environmental Service Rewards, World Agroforestry, Bogor, 56 pp., 2006.

Keles, H., Yayla, O., Tarinc, A., and Keles, A.: The Effect of Environmental Management Practices and Knowledge in Strengthening Responsible Behavior: The Moderator Role of Environmental Commitment, Sustain., 15, https://doi.org/10.3390/su15021398, 2023.

Leimona, B., Khasanah, N., Lusiana, B., and ...: A business case: co-investing for ecosystem service provisions and local livelihoods in Rejoso watershed, 2018.

Medema, W., Mayer, I., Adamowski, J., Wals, A. E. J., and Chew, C.: The potential of serious games to solve water problems: Editorial to the special issue on game-based approaches to sustainable water governance, Water (Switzerland), 11, https://doi.org/10.3390/w11122562, 2019.

van Noordwijk, M., Lusiana, B., Leimona, B., Dewi, S., and Wulandari, D.: Negotiation-support toolkit for learning landscapes, edited by: van Noordwijk, M., Lusiana, B., Leimona, B., Dewi, S., and Wulandari, D., World Agroforestry Southeast Asia Regional Program, 2013.

van Noordwijk, M., Speelman, E., Hofstede, G. J., Farida, A., Kimbowa, G., Geraud, G., Assogba, C., Best, L., and Tanika, L.: Sustainable Agroforestry Landscape Management :, Land, 9, 1–38, 2020.

Rodela, R and Speelman, E.N., 2023, Serious game in natural resource management: steps toward assessment of their contextualized impacts, Current Opinion in Environmental Sustainability (under review process)

van Noordwijk, M., Speelman, E., Hofstede, G. J., Farida, A., Kimbowa, G., Geraud, G., Assogba, C., Best, L., and Tanika, L.: Sustainable Agroforestry Landscape Management :, Land, 9, 1–38, 2020.